RFW:
07-0004
SDMS 3092

Corporate Environmental Programs
General Electric Company
100 Woodlawn Ave., Pittsfield, MA 01201

February 8, 1999

Mr. Bryan Olson
Mr. Dean Tagliaferro
Site Evaluation and Response Section (HBR)
U.S. Environmental Protection Agency
One Congress Street
Boston, MA 02203-2211

Mr. Alan Weinberg
Bureau of Waste Site Cleanup
Department of Environmental Protection
436 Dwight Street
Springfield, MA 01103

Re: Source Control Investigation Report
Upper Reach of Housatonic River (First ½ Mile)

Dear Mr. Olson, Mr. Tagliaferro, Mr. Weinberg:

Enclosed please find the document entitled *Source Control Investigation Report Upper Reach of Housatonic River (First ½ Mile).* This document has been prepared on behalf of the General Electric Company (GE) by HSI GeoTrans, Inc. It presents the results of investigations conducted for GE between October 7, 1998 and January 5, 1999, pursuant to the *Source Control Work Plan - Upper Reach of the Housatonic River (First ½ Mile)* (BBL September 1998).

Please contact me at (413) 494-3952 if you have any comments regarding the enclosed document.

Yours truly,

John D. Ciampa

John D. Ciampa
Remediation Project Manager

cc:
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GENERAL ELECTRIC - PITTSFIELD

SOURCE CONTROL INVESTIGATION REPORT
UPPER REACH OF HOUSATONIC RIVER (FIRST ½ MILE)

PREPARED FOR:

GENERAL ELECTRIC COMPANY

PREPARED BY:

HSI GEOTRANS, INC.
6 LANCASTER COUNTY ROAD
HARVARD, MASSACHUSETTS 01451

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1 INTRODUCTION

This report describes the Source Control investigations conducted between October 7, 1998 and January 5, 1999 for the General Electric Company in Pittsfield, Massachusetts. The investigations were conducted adjacent to the reach of the Housatonic River between the Newell Street bridge and the Lyman Street bridge (first ½ mile). Figure 1-1 shows the general location of where the source control investigation work was conducted. The work was performed in accordance with the Source Control Work Plan-Upper Reach of Housatonic River (First ½ Mile) (BBL, 1998a) and the EPA conditional approval dated October 6, 1998. The investigations focused on several areas where previous investigations indicated the presence of non-aqueous phase liquids (NAPL). These areas included the East Street Area 2, Lyman Street site and Newell Street Area II sites (the Sites). This report primarily presents the findings of the Source Control investigations at the Newell Street Area II site and the Lyman Street site. The findings of the Source Control Investigations conducted at the East Street Area 2 site were presented in the recently submitted Proposal for Supplemental Source Control, Containment / Recovery Measures (BBL, 1999).

1.1 PURPOSE OF INVESTIGATIONS

The purpose of these source control investigations was to further evaluate the nature and extent of light non-aqueous phase liquids (LNAPL) and dense non-aqueous phase liquids (DNAPL) to assess potential additional NAPL control or recovery activities at sites adjacent to the First ½ Mile. GE has over the years conducted numerous detailed investigations of the sites at and adjacent to the First ½ Mile of the river, and has installed and continues to operate numerous source control measures in those areas. GE believes that these measures are effectively controlling any significant migration of non-aqueous phase liquid (NAPL). Nevertheless, in accordance with a commitment that GE made in settlement discussions

among the parties involved at these sites, this investigation has been conducted. The design of the investigations and interpretation of the recently collected data considered the pertinent information previously collected at the Sites.

1.2 BACKGROUND

As previously indicated, GE has performed extensive environmental investigations since the 1970s and implemented numerous remedial measures at the Pittsfield plant site and within the area adjacent to the First ½ Mile of the Housatonic River. In the last decade, investigation and remediation activities have been performed pursuant to a July 1990 consent order with the Massachusetts Department of Environmental Protection (DEP) and a RCRA corrective action permit issued by the United States Environmental Protection Agency (EPA), effective in January 1994. These investigation and remediation activities have included several distinct sites which are also associated with these source control investigations, including the following:

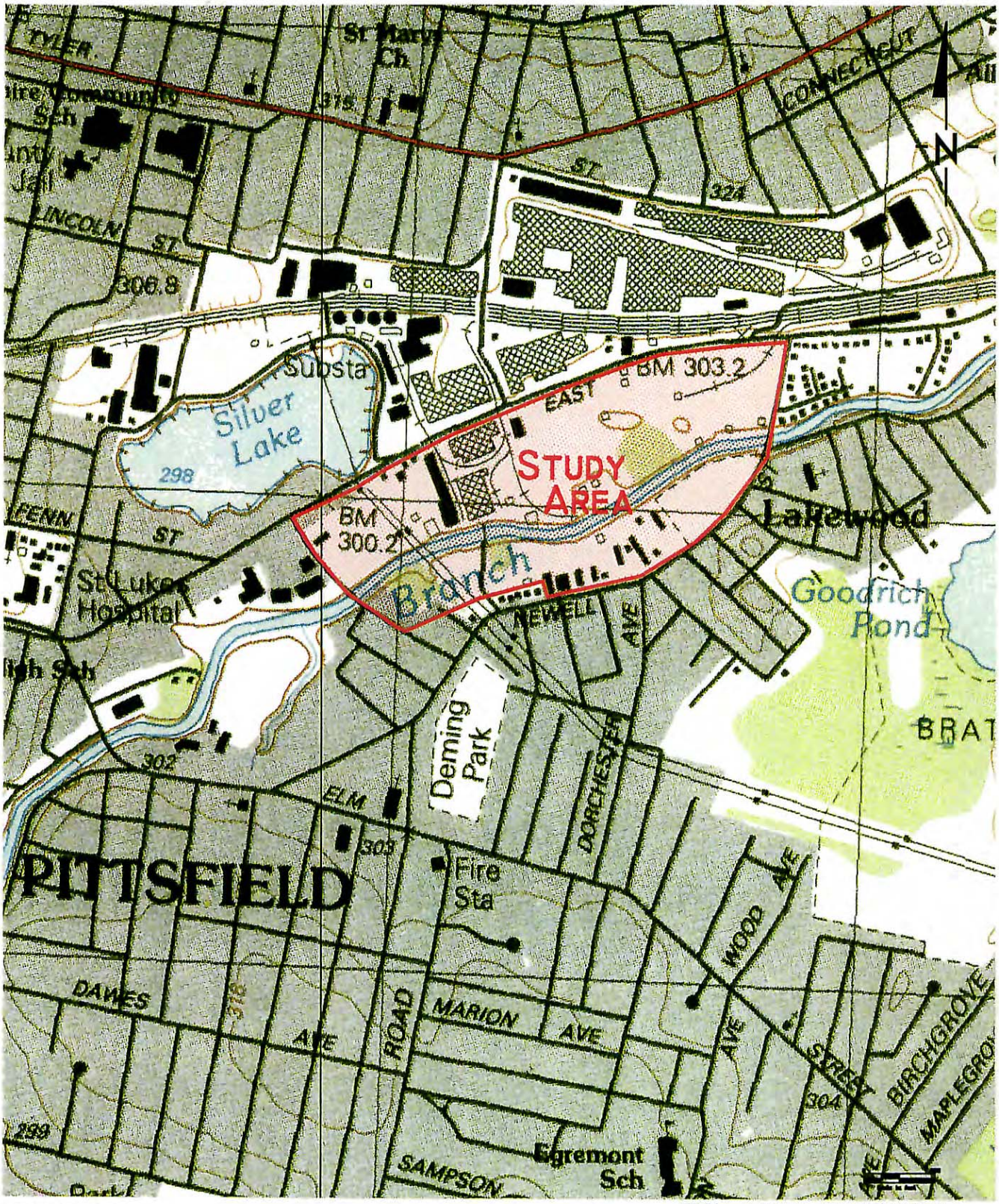
- USEPA Area 4 / DEP East Street Area 2 site
- USEPA Area 5A / DEP Lyman Street site
- USEPA Area 5B / DEP Newell Street Area II site
- DEP Newell Street Area I site

Within each of these sites, investigations related to determining the potential presence of NAPL have been performed. The investigations performed have included the drilling of numerous borings and installation of monitoring wells to assess subsurface soil and groundwater conditions. Included in this assessment has been an evaluation of the groundwater flow regime, and the presence and lateral extent of NAPL. In addition to the subsurface investigations, a number of remedial measures to contain and recover NAPL have been implemented at the GE plant site, the Lyman Street site and the Newell Street Area II

site. These measures have included the installation of subsurface barrier walls, groundwater /NAPL recovery systems, manual oil removal programs, and the installation/maintenance of containment boom systems along two portions of the riverbank.

As previously stated, GE believes that the performance monitoring data for the on-going remedial actions demonstrate that the existing remedial actions along the First ½ Mile are effectively preventing any significant migration of NAPL to the river. Nonetheless, GE recently submitted a proposal to the EPA and the Massachusetts DEP (Agencies) for an additional containment barrier in the East Street Area 2 site to provide further assurance of LNAPL containment (Proposal for Supplemental Source Control, Containment / Recovery Measures (BBL, 1999)). It is also anticipates that a similar proposal for further containment will be submitted for the Lyman Street site within the next few weeks. Furthermore, GE is in the process of constructing an automated DNAPL recovery system in the Newell Street Area II site. That recovery system has been approved by the Agencies and an order of conditions for its construction has been issued by the Pittsfield Conservation Commission.

The information contained in this report will be used to design the supplemental NAPL control measure for the Lyman Street site and to assess whether further investigation or remediation of NAPL is warranted along the First ½ Mile.



QUADRANGLE LOCATION

0 1000

Scale in feet

FROM U.S.G.S. QUADRANGLE PITTSFIELD, MASSACHUSETTS

Contour Interval 3 Meters

National Geodetic Vertical Datum Of 1929

HSI GEOTRANS
A TETRA TECH COMPANY

Figure 1-1 Site Location Map

2 METHOD OF INVESTIGATION

As part of these source control investigations, 42 borings were drilled to collect additional samples of the unconsolidated deposits underlying the East Street Area 2, Newell Street Area II and the Lyman Street sites. Monitoring wells were installed in 31 of the borings. Drilling methods used included hollow stem auger, drive and wash, and direct push methods. The drilling technique used at each location was selected based primarily on consideration of the planned boring depth and whether NAPL was encountered in samples collected during drilling. In some cases, the drive and wash technique was used to improve recovery of subsurface soil samples. Soil cores were collected in split spoon samplers using the standard penetration test method (ASTM D1586). Field screening of soil samples for volatile organic compounds (VOCs) was performed by the head space method using a Photo Ionization Detector (PID). Soil samples were also visually examined for the presence of NAPL. When field screening or visual observations indicated the possible presence of NAPL, water shake tests were performed. Staining, sheens and NAPL observations were noted on the boring logs. Oversight of the field activities was conducted by Roy F. Weston personnel, on behalf of EPA. Figure 2-1 shows the locations of the newly installed Source Control investigation borings and wells, along with borings and wells from previous investigations. The boring logs and well construction details for the newly installed wells are included in Appendix A

A number of composite soil samples were collected for PCB analysis from the upper 15 feet in each boring. As approved by EPA, and discussed further in sections 3 and 4, sample composite intervals varied by site to be consistent with the Agreement in Principal between GE and the Agencies. Table 2-1 lists the sample composite intervals for each site. One discrete sample for VOC analysis was also collected from the upper 15 feet of each boring. The interval selected for analysis was that which had the highest field-screening PID reading. To be consistent with updated EPA sampling methodologies and the draft revisions of the Sampling and Analysis Plan (BBL, 1998b), the method for VOC sample collection was

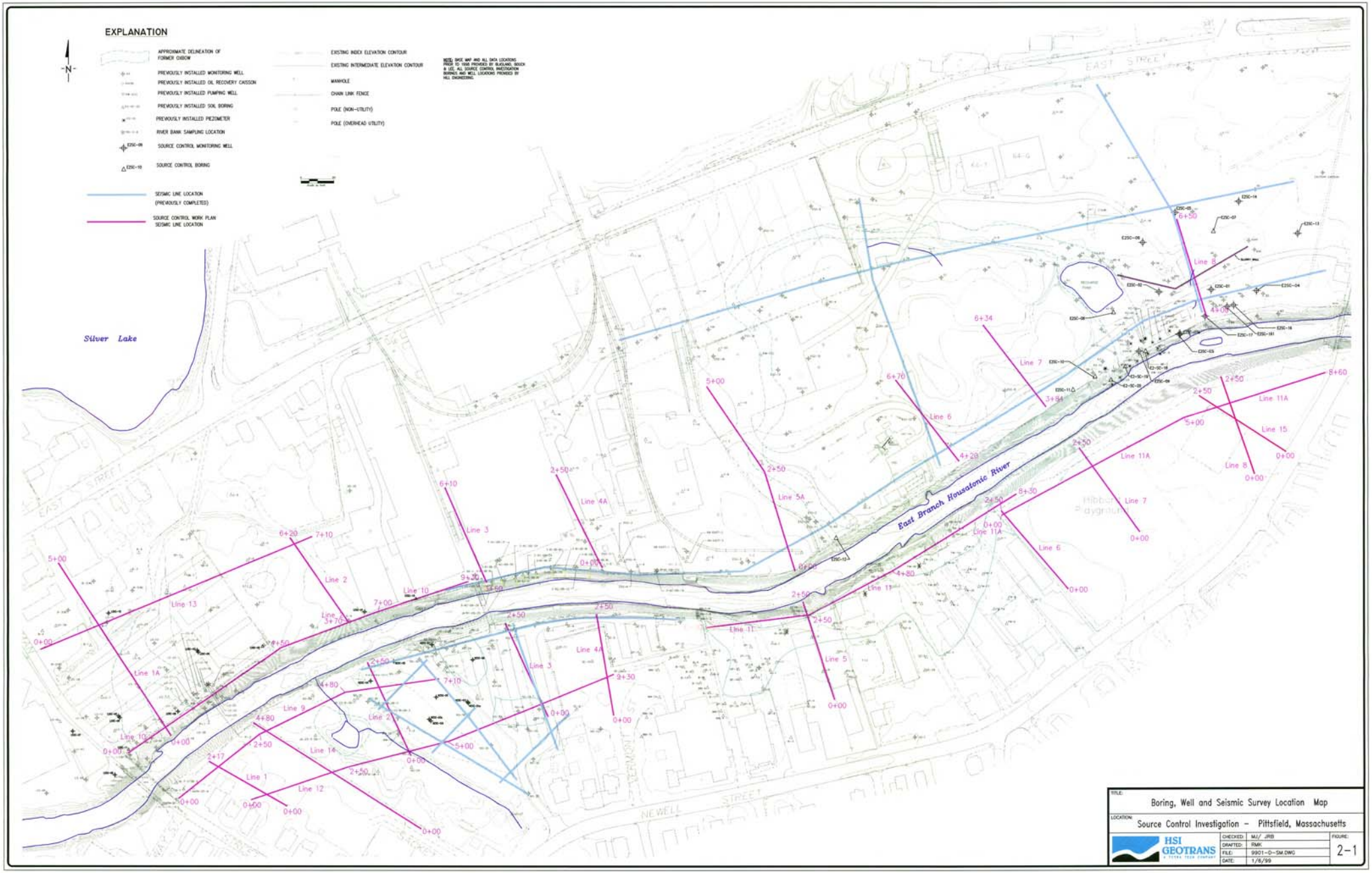
changed early in the field work. Initially, samples for VOC analyses were collected and placed in four-ounce, wide-mouth bottles. However, after October 20, 1998, all soil samples for VOC analyses were placed directly into Encore® sample containers. This allowed the samples to be extracted utilizing the new EPA method 5035.

In borings that extended to the till surface, one sample was collected from the unconsolidated deposits directly above the till surface for PCB analysis. A minimum of one sample from each boring was also selected for Appendix IX +3 constituents. The sample for Appendix IX +3 analysis was collected from the interval with the highest PID field-screening reading. In addition, a soil sample was collected for Appendix IX+3 analysis when visual observations indicated the presence of DNAPL within a soil core. If separate phase DNAPL accumulated in the newly installed wells at a particular site, a minimum of one DNAPL sample was collected at each site and analyzed for Appendix IX+3 constituents.

To provide additional information on the stratigraphy beneath the Sites, seismic refraction surveys were conducted by Geophysical Applications, Inc. These geophysical surveys were used to supplement the soil boring data and previously collected seismic data. An important objective of the geophysical surveys was to identify and assess the topography of dense subsurface confining layers (e.g., till). Figure 2-1 shows the locations of the 1998 seismic refraction surveys performed as part of these investigations, as well as the previously conducted geophysical surveys. Appendix B contains the report on the Seismic Refraction Survey prepared by Geophysical Applications, Inc.

Table 2-1. Composite soil sample intervals

EAST STREET AREA 2	0 to 1 Feet
	1 to 6 Feet
	6 to 15 Feet
NEWELL STREET AREA II	0 to 1 Feet
	1 to 3 Feet
	3 to 6 Feet
	6 to 10 Feet
	10 to 15 Feet
Lyman Street Site	0 to 1 Feet
	1 to 3 Feet
	3 to 6 Feet
	6 to 10 Feet
	10 to 15 Feet


EXPLANATION
APPROXIMATE DELINEATION OF FORMER OXBOW
PREVIOUSLY INSTALLED MONITORING WELL
PREVIOUSLY INSTALLED OIL RECOVERY CAISSON
PREVIOUSLY INSTALLED PUMPING WELL
PREVIOUSLY INSTALLED SOIL BORING
PREVIOUSLY INSTALLED PIEZOMETER
RIVER BANK SAMPLING LOCATION
SOURCE CONTROL MONITORING WELL
SOURCE CONTROL BORING
SEISMIC LINE LOCATION (PREVIOUSLY COMPLETED)
SOURCE CONTROL WORK PLAN SEISMIC LINE LOCATION
EXISTING INDEX ELEVATION CONTOUR
EXISTING INTERMEDIATE ELEVATION CONTOUR
MANHOLE
CHAIN LINK FENCE
POLE (NON-UTILITY)
POLE (OVERHEAD UTILITY)
NOTE: BASE MAP AND ALL DATA LOCATIONS PRIOR TO 1998 PROVIDED BY BLASLAND, BOUCK & LEE, ALL SOURCE CONTROL INVESTIGATION BORINGS AND WELL LOCATIONS PROVIDED BY HILL ENGINEERING.
Silver Lake
East Branch Housatonic River
EAST STREET
NEWELL STREET
Line 1
Line 1A
Line 2
Line 3
Line 4
Line 4A
Line 5
Line 5A
Line 6
Line 7
Line 8
Line 9
Line 10
Line 11
Line 11A
Line 12
Line 13
Line 14
Line 15
TITLE: Boring, Well and Seismic Survey Location Map
LOCATION: Source Control Investigation – Pittsfield, Massachusetts
HSI GEOTRANS
CHECKED: MJ/ JRB
DRAFTED: RMK
FILE: 9901-0-SM.DWG
DATE: 1/6/99
FIGURE: 2-1

3 NEWELL STREET AREA II

Between October 28 and November 6, 1998, nine borings were drilled at seven locations on the Newell Street Area II site. Monitoring wells were installed in all of the borings. The wells are constructed of 2-inch diameter PVC with 10-foot long well screens. A 1-foot long sump was installed at the bottom of each well screen. The locations of the new wells and previously installed wells and borings are shown on Figure 3-1. Boring logs and well construction diagrams of the newly installed wells are included in Appendix A. The primary purpose of these additional investigations at the Newell Street Area II site was to further investigate the configuration of the low permeability confining layer (till surface) and the extent of DNAPL beneath the site. DNAPL pumping tests were also conducted to evaluate potential collection locations and methods at the site.

3.1 STRATIGRAPHY

The Newell Street Area II site is underlain by a sequence of unconsolidated deposits consisting of fill (0 to 19 feet thick), interbedded fine sand and silt with peat (0 to 12 feet thick), and fine to coarse sand and gravel (5 to 24 feet thick). All of these units occur above a till layer which constitutes a low permeability confining layer. The till consist of stiff to hard silt, and dense to very dense silty sand with gravel. Figure 3-2 is an elevation contour map of the till surface. As illustrated, there is a depression in the top of till surface with its lowest elevation occurring at 946 feet. This elevation is approximately 35 to 37 feet below the surface and 22 to 24 feet below the bed of the Housatonic River. Figures 3-3 and 3-4 are cross sections showing the stratigraphy of the unconsolidated deposits beneath the Newell Street Area II site. Soil borings/monitoring wells which contain NAPL are shown on the cross-sections. Additionally, soil zones which were observed to contain staining and sheens during drilling are also shown on the cross sections. However, it should be noted that these zones do not necessarily indicate the presence of NAPL.

3.2 RESULTS OF CHEMICAL ANALYSES

As described in section 2 of this report, samples of the unconsolidated deposits were collected for PCB analysis. Certain samples were also analyzed for Appendix IX+3 constituents. Table 3-1 lists the samples collected at the Newell Street Area II site and the analyses performed on each sample.

The areal distribution of PCB soil concentrations is shown on Figure 3-5. The concentrations of detected analytes are summarized in Tables 3-2 through 3-6. Table 3-2 summarizes PCB analyses, Table 3-3 summarizes VOC analyses, Table 3-4 summarizes SVOC analyses, Table 3-5 summarizes the metals analyses and Table 3-6 summarizes the dioxin and furan analyses. DNAPL samples were collected from wells N2SC-01I, N2SC-02, N2SC-03S and N2SC-03I for chemical analysis. The results of these analyses indicate that the DNAPL generally consists of approximately 30% Aroclor 1254. The DNAPL samples also contained approximately 15% chlorinated and aromatic VOCs, 3% chlorinated benzene SVOCs, and lower concentrations of PAH compounds. The concentrations of detected compounds in the DNAPL samples are summarized in Table 3-7.

3.3 EXTENT OF NAPL

Water level and NAPL measurements have been collected weekly from the newly installed wells at Newell Street since development of the wells was completed. The water level and NAPL measurement data are presented in Table 3-8. These data indicate that there is DNAPL present in a depression in the till surface which exists in the central portion of the site. In addition to the wells monitored during these investigations, GE gauges 22 other wells as part of the ongoing monitoring program for the site. These wells are: NS-1, 9, 10, 11, 15, 16, 17, 18, 19, 20, 21, 23, 30, 31, 32, 33, 34, 35, 36, 37 and MW-1S and 1D. Figure 3-6 shows the wells in which DNAPL has been observed. The DNAPL extends from the newly installed well N2SC-07, located in the northern portion of the site, to well N2SC-01I, located to the south. The westernmost well in which DNAPL has been observed is well cluster

MW-1D and 1S. The easternmost well with DNAPL is NS-31. Figures 3-3 and 3-4, which are cross sections D-D[1] and E-E[1], show the vertical distribution of staining, sheens, and DNAPL. Typically, DNAPL occurs at a depth of approximately 35 feet below the surface, which equates to a depth of approximately 20 feet below the Housatonic River bed. Localized occurrences of DNAPL have been observed in shallow wells N2SC-03I and MW-1S. At these locations, it appears that a small amount of DNAPL is perched on shallower low permeability layers.

A localized occurrence of LNAPL also occurs in monitoring well NS-10. This well is located approximately 300 feet from the river and is subject to weekly monitoring and manual removal. During 1998, the apparent LNAPL thickness ranged from .01 feet to .54 feet, and less than 1 gallon was manually recovered from the well. Monitoring does not indicate that this LNAPL has migrated beyond the vicinity of this well. It should also be noted that .01 feet of LNAPL was apparently detected in well N2SC-1I on one occasion. However, this is a deep well which was installed to monitor DNAPL and the well screen does not intersect the water table. The well does contain DNAPL at its bottom and the small amount of apparent LNAPL detected is most likely DNAPL residual which may have come off the measuring probe and is being held by surface tension at the top of the water surface in the well.

3.4 RESULTS OF DNAPL PUMPING TEST

An initial pumping test was performed for monitoring well N2SC-1I on December 18, 1998. Based on the results of this initial test, it appeared that an automated DNAPL recovery system might be warranted for this well, since it recovered significantly more DNAPL than the surrounding wells and is located in a depression of the till confining layer. To further evaluate the potential recovery volumes in this area, GE proposed in a letter dated January 8, 1999, to perform daily 1-hour recovery tests over a two-week time frame and an extended one-day recovery test. The proposed tests were conducted between January 15 and February

1, 1999. Throughout the recovery study, DNAPL was pumped directly into drums which were collected after daily pumping was completed and transported to Building 78 for storage and subsequent disposal. The results of these recovery field tests are presented in Appendix C and are summarized below.

Between January 15 and 29, 1999, DNAPL was pumped daily from well N2SC-1I over an approximate 1-hour time period. The daily DNAPL removal volumes ranged from 11 gallons to 19.5 gallons. The total volume of DNAPL recovered was approximately 136 gallons, with an average daily recovery rate of approximately 0.23 gallons per minute (13.8 gallons per hour). This recovery rate remained relatively constant over the two-week period. On February 1, 1999, the one-day DNAPL recovery test was performed. The well was pumped for approximately 5 hours and a total of 51.9 gallons of DNAPL were recovered. The average recovery rate was 0.19 gallons per minute (11.8 gallons per hour). This recovery rate also remained relatively constant over the 5-hour period.

Based on these recovery test results, installation of an automated DNAPL pumping system is proposed for monitoring well N2SC-1I. This system will consist of the downhole installation of a pneumatic DNAPL pump which will be operated by an automated timing system. GE is currently evaluating storage tank options and anticipates that a 2,500 to 5,000 gallon storage capacity may be required. It is currently anticipated that DNAPL storage will occur on GE property adjacent to well N2SC-1I. GE will complete its engineering evaluation and will submit plans to the USEPA within approximately 30 days. Because this storage will be conducted within the 100-year floodplain, a Notice of Intent (NOI) may have to be submitted to the Pittsfield Conservation Commission once the plans are approved by the USEPA. The NOI (if required) will need to evaluate floodplain compensation concerns in terms of the configuration of any buildings, storage tanks, or containment dikes associated with the collection and storage system.

The proposed automated DNAPL pumping system for monitoring well N2SC-1I is in addition to the automated collection system previously proposed for monitoring wells NS-15,

NS-30, and NS-32. The automated collection system for these wells has already been approved by EPA and it is anticipated that it will be operational within 30 days. As previously agreed with EPA, GE will continue to perform daily monitoring and DNAPL recovery, as necessary, for wells NS-15, NS-30, NS-32, N2SC-2, N2SC-3I, N2SC-3S, and N2SC-1I until the automated recovery systems are operational. Additionally, daily monitoring and removal will be performed at N2SC-7, which has only recently detected DNAPL. If this well consistently maintains a DNAPL thickness of one foot after daily monitoring/removal, a pumping test will be performed in the well and a recommendation will be made to EPA regarding the need to install an automated pumping system.

Table 3-1 Newell Street Area II Soil Samples Collected and Analyses Preformed

BORING	SAMPLE ID	DATE	TIME	DEPTH	ANALYSIS REQUESTED
N2SC-01	CS01	10/29/98	10:44	0-1	PCB
N2SC-01	CS0103	10/29/98	10:44	1-3	PCB
N2SC-01	CS0306	10/29/98	10:44	3-6	PCB
N2SC-01	CS0610	10/29/98	10:44	6-10	PCB
N2SC-01	CS1015	10/29/98	10:44	10-15	PCB & App IX + 3
N2SC-01	CS3840	10/29/98	17:20	38-40	PCB
N2SC-01	SS07	10/29/98	10:20	10-12	App IX VOC
N2SC-01I	13771	12/17/98		N/A	PCB & App IX + 3
N2SC-02	CS01	11/3/98	15:45	0-1	PCB
N2SC-02	CS0103	11/3/98	15:45	1-3	PCB
N2SC-02	CS0306	11/3/98	15:45	3-6	PCB & App IX + 3
N2SC-02	CS0610	11/3/98	15:45	6-10	PCB
N2SC-02	CS1015	11/3/98	15:45	10-15	PCB
N2SC-02	CS3436	11/4/98	10:37	34-36	PCB & App IX + 3
N2SC-02	CS3638	11/4/98	10:37	36.5-38	PCB
N2SC-02	SS03	11/5/98	12:45	3-5	App IX VOC
N2SC-02	SS20	11/5/98	12:45	34-36	App IX VOC
N2SC-02	A0257	12/17/98		N/A	PCB & App IX + 3
N2SC-03	CS01	11/2/98	12:15	0-1	PCB
N2SC-03	CS0103	11/2/98	12:15	1-3	PCB
N2SC-03	CS0306	11/2/98	12:15	3-6	PCB
N2SC-03	CS0610	11/2/98	12:15	6-10	PCB
N2SC-03	CS1015	11/2/98	12:15	10-15	PCB & App IX + 3
N2SC-03	CS3638	11/2/98	14:45	36-38	PCB
N2SC-03	SS09	11/2/98	10:37	14-15	App IX VOC
N2SC-03I	13773	12/17/98		N/A	PCB & App IX + 3
N2SC-03S	13772	12/17/98		N/A	PCB & App IX + 3
N2SC-04	CS01	11/4/98	17:00	0-1	PCB
N2SC-04	CS0103	11/4/98	17:00	1-3	PCB
N2SC-04	CS0306	11/4/98	17:00	3-6	PCB
N2SC-04	CS0610	11/4/98	17:00	6-10	PCB
N2SC-04	CS1015	11/4/98	17:00	10-15	PCB & App IX + 3
N2SC-04	SS09	11/4/98	16:49	14-15	App IX VOC
N2SC-04	CS2830	11/5/98	8:50	28-30	PCB
N2SC-05	CS01	11/5/98	14:35	0-1	PCB
N2SC-05	CS0103	11/5/98	14:35	1-3	PCB
N2SC-05	CS0306	11/5/98	14:35	3-6	PCB
N2SC-05	CS0610	11/5/98	14:35	6-10	PCB
N2SC-05	CS1015	11/5/98	14:35	10-15	PCB & App IX + 3
N2SC-05	CS3436	11/5/98	16:45	34-36	PCB
N2SC-05	SS08	11/5/98	14:18	12-14	App IX VOC
N2SC-06	CS01	10/28/98	12:00	0-1	PCB
N2SC-06	CS0103	10/28/98	12:00	1-3	PCB
N2SC-06	CS0306	10/28/98	12:00	3-6	PCB
N2SC-06	CS0610	10/28/98	12:00	6-10	PCB
N2SC-06	CS1015	10/28/98	12:00	10-15	PCB & App IX + 3
N2SC-06	CS3436	10/28/98	14:10	34-36	PCB
N2SC-06	SS09	10/28/98	11:45	14-15	App IX VOC

Table 3-1 Newell Street Area II Soil Samples Collected and Analyses Preformed (continued).

BORING	SAMPLE ID	DATE	TIME	DEPTH	ANALYSIS REQUESTED
N2SC-07	CS01	11/6/98	14:30	0-1	PCB
N2SC-07	CS0103	11/6/98	14:30	1-3	PCB
N2SC-07	CS0306	11/6/98	14:30	3-6	PCB
N2SC-07	CS0610	11/6/98	14:30	6-10	PCB
N2SC-07	CS1015	11/6/98	14:30	10-15	PCB & App IX + 3
N2SC-07	CS3234	11/9/98	12:25	32-34	PCB & App IX + 3
N2SC-07	CS3436	11/9/98	12:25	34-36	PCB
N2SC-07	SS09	11/6/98	14:09	14-15	App IX VOC
N2SC-07	SS17	11/9/98	12:12	32-34	App IX VOC

Table 3-2 Detected PCB Soil Concentrations, Newell Street Area II.

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Units*
N2SC-01					
	CS01	0-1			
			Aroclor 1254	230	mg/kg
			Aroclor 1260	200	mg/kg
			Total PCBs	**430**	mg/kg
	CS0103	1-3			
			Aroclor 1254	1900	mg/kg
			Total PCBs	**1900**	mg/kg
	CS0306	3-6			
			Aroclor 1254	2800	mg/kg
			Total PCBs	**2800**	mg/kg
	CS0610	6-10			
			Aroclor 1254	61	mg/kg
			Total PCBs	**61**	mg/kg
	CS1015	10-15			
			Aroclor 1254	860	mg/kg
			Total PCBs	**860**	mg/kg
	CS3840	38-40			
			Aroclor 1254	87	mg/kg
			Total PCBs	**87**	mg/kg
N2SC-02					
	CS01	0-1			
			Aroclor 1254	980	mg/kg
			Total PCBs	**980**	mg/kg
	CS0103	1-3			
			Aroclor 1254	5900	mg/kg
			Total PCBs	**5900**	mg/kg
	CS0306	3-6			
			Aroclor 1254	3600	mg/kg
			Total PCBs	**3600**	mg/kg
	CS0610	6-10			
			Aroclor 1254	3.7	mg/kg
			Total PCBs	**3.7**	mg/kg
	CS1015	10-15			
			Aroclor 1254	51	mg/kg
			Total PCBs	**51**	mg/kg
	CS3436	34-36			
			Aroclor 1260	6000	mg/kg

Table 3-2 Detected PCB Soil Concentrations, Newell Street Area II (continued).

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Units*
			Aroclor 1254	14000	mg/kg
			Total PCBs	**20000**	mg/kg
	CS3638	36-38			
			Aroclor 1254	940	mg/kg
			Aroclor 1260	420	mg/kg
			Total PCBs	**1360**	mg/kg
N2SC-03					
	CS01	0-1			
			Aroclor 1254	150	mg/kg
			Total PCBs	**150**	mg/kg
	CS0103	1-3			
			Aroclor 1260	23000	mg/kg
			Aroclor 1254	20000	mg/kg
			Total PCBs	**43000**	mg/kg
	CS0306	3-6			
			Aroclor 1260	5300	mg/kg
			Total PCBs	**5300**	mg/kg
	CS0610	6-10			
			Aroclor 1254	1800	mg/kg
			Aroclor 1260	1400	mg/kg
			Total PCBs	**3200**	mg/kg
	CS1015	10-15			
			Aroclor 1254	52000	mg/kg
			Total PCBs	**52000**	mg/kg
	CS3638	36-38			
			Aroclor 1254	1600	mg/kg
			Total PCBs	**1600**	mg/kg
N2SC-04					
	CS01	0-1			
			Aroclor 1254	130	mg/kg
			Total PCBs	**130**	mg/kg
	CS0103	1-3			
			Aroclor 1254	160	mg/kg
			Total PCBs	**160**	mg/kg
	CS0306	3-6			
			Aroclor 1254	14	mg/kg
			Aroclor 1260	7.1	mg/kg
			Total PCBs	**21.1**	mg/kg

Table 3-2 Detected PCB Soil Concentrations, Newell Street Area II (continued).

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Units*
	CS0610	6-10			
			Aroclor 1254	250	mg/kg
			Total PCBs	**250**	mg/kg
	CS1015	10-15			
			Aroclor 1254	1.7	mg/kg
			Total PCBs	**1.7**	mg/kg
	CS2830	28-30			
			Aroclor 1254	1.6	mg/kg
			Total PCBs	**1.6**	mg/kg
N2SC-05					
	CS01	0-1			
			Aroclor 1254	2900	mg/kg
			Total PCBs	**2900**	mg/kg
	CS0103	1-3			
			Aroclor 1254	22000	mg/kg
			Total PCBs	**22000**	mg/kg
	CS0306	3-6			
			Aroclor 1254	56	mg/kg
			Total PCBs	**56**	mg/kg
	CS0610	6-10			
			Aroclor 1254	28	mg/kg
			Total PCBs	**28**	mg/kg
	CS1015	10-15			
			Aroclor 1254	0.7	mg/kg
			Total PCBs	**0.7**	mg/kg
	CS3436	34-36			
			Aroclor 1254	270	mg/kg
			Total PCBs	**270**	mg/kg
N2SC-06					
	CS01	0-1			
			Aroclor 1254	0.95	mg/kg
			Total PCBs	**0.95**	mg/kg
	CS0103	1-3			
			Aroclor 1254	940	mg/kg
			Total PCBs	**940**	mg/kg
	CS0306	3-6			
			Aroclor 1254	560	mg/kg
			Aroclor 1260	220	mg/kg

Table 3-2 Detected PCB Soil Concentrations, Newell Street Area II (continued).

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Units*
			Total PCBs	**780**	mg/kg
	CS0610	6-10			
			Aroclor 1254	1400	mg/kg
			Total PCBs	**1400**	mg/kg
	CS1015	10-15			
			Aroclor 1254	85	mg/kg
			Total PCBs	**85**	mg/kg
	CS3436	34-36			
			Aroclor 1254	11	mg/kg
			Aroclor 1260	32	mg/kg
			Total PCBs	**43**	mg/kg
N2SC-07					
	CS01	0-1			
			Aroclor 1254	0.78	mg/kg
			Total PCBs	**0.78**	mg/kg
	CS0103	1-3			
			Aroclor 1254	20	mg/kg
			Total PCBs	**20**	mg/kg
	CS0306	3-6			
			Aroclor 1254	74	mg/kg
			Aroclor 1260	28	mg/kg
			Total PCBs	**102**	mg/kg
	CS0610	6-10			
			Aroclor 1254	11	mg/kg
			Total PCBs	**11**	mg/kg
	CS1015	10-15			
			Aroclor 1254	7.9	mg/kg
			Total PCBs	**7.9**	mg/kg
	CS3234	32-34			
			Aroclor 1254	13000	mg/kg
			Total PCBs	**13000**	mg/kg
	CS3436	34-36			
			Aroclor 1254	120	mg/kg
			Total PCBs	**120**	mg/kg

Table 3-3 Detected VOC Soil Concentrations, Newell Street Area II.

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
N2SC-01						
	SS07	10-12				
			cis-1,2-Dichloroethene	26		mg/kg
			Trichloroethene	3.3		mg/kg
N2SC-02						
	SS20	34-36				
			Acetone	0.75		mg/kg
			Trichloroethene	0.43		mg/kg
N2SC-03						
	SS09	14-15				
			cis-1,2-Dichloroethene	130		mg/kg
			Toluene	4.5	J	mg/kg
			Trichloroethene	170		mg/kg
N2SC-04						
	SS09	14-15				
			Acetone	1		mg/kg
			Trichloroethene	0.42		mg/kg
N2SC-07						
	SS09	14-15				
			Acetone	0.13		mg/kg
			Benzene	0.0043	J	mg/kg
			Chlorobenzene	0.16		mg/kg
			cis-1,2-Dichloroethene	0.11		mg/kg
			Toluene	0.0042	J	mg/kg
			Vinyl chloride	0.031		mg/kg

Qualifier

J *Result is between MDL and RL.*

Table 3-4 Detected SVOC Soil Concentrations, Newell Street Area II.

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
N2SC-01						
	CS1015	10-15				
			1,2,4,5-Tetrachlorobenzene	0.81	J	mg/kg
			1,2,4-Trichlorobenzene	24		mg/kg
			2,4-Dimethylphenol	0.37	J	mg/kg
			2-Methylnaphthalene	0.69	J	mg/kg
			Acenaphthene	5.6		mg/kg
			Acenaphthylene	1	J	mg/kg
			Anthracene	6.6		mg/kg
			Benzo(a)anthracene	7.4		mg/kg
			Benzo(a)pyrene	6.5		mg/kg
			Benzo(b)fluoranthene	8.1		mg/kg
			Benzo(ghi)perylene	1.1	J	mg/kg
			Benzo(k)fluoranthene	3.6		mg/kg
			bis(2-Ethylhexyl) phthalate	0.37	J	mg/kg
			Chrysene	7.1		mg/kg
			Dibenz(a,h)anthracene	0.38	J	mg/kg
			Dibenzofuran	2.2	J	mg/kg
			Fluoranthene	24		mg/kg
			Fluorene	5.5		mg/kg
			Indeno(1,2,3-cd)pyrene	1.2	J	mg/kg
			Naphthalene	2.3	J	mg/kg
			Phenanthrene	19		mg/kg
			Pyrene	13		mg/kg
N2SC-02						
	CS0306	3-6				
			1,2,4-Trichlorobenzene	4.5		mg/kg
			Acenaphthene	0.5	J	mg/kg
			Acenaphthylene	1.1	J	mg/kg
			Anthracene	1.5	J	mg/kg
			Benzo(a)anthracene	5.7		mg/kg
			Benzo(a)pyrene	7.2		mg/kg
			Benzo(b)fluoranthene	8.5		mg/kg
			Benzo(ghi)perylene	2.6		mg/kg
			Benzo(k)fluoranthene	3.8		mg/kg
			bis(2-Ethylhexyl) phthalate	0.9	J	mg/kg
			Chrysene	5.7		mg/kg
			Dibenz(a,h)anthracene	0.75	J	mg/kg

Table 3-4 Detected SVOC Soil Concentrations, Newell Street Area II (continued).

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
			Dibenzofuran	0.5	J	mg/kg
			Fluoranthene	11		mg/kg
			Fluorene	0.63	J	mg/kg
			Indeno(1,2,3-cd)pyrene	3.1		mg/kg
			Naphthalene	0.64	J	mg/kg
			Phenanthrene	6.2		mg/kg
			Pyrene	8.5		mg/kg
	CS3436	34-36				
			1,2,4,5-Tetrachlorobenzene	28		mg/kg
			1,2,4-Trichlorobenzene	990		mg/kg
			1,2-Dichlorobenzene	14	J	mg/kg
			1,4-Dichlorobenzene	30		mg/kg
			2-Methylnaphthalene	3.8	J	mg/kg
			Dibenzofuran	1.5	J	mg/kg
			Naphthalene	7	J	mg/kg
			Pentachlorobenzene	1.8	J	mg/kg
N2SC-03						
	CS1015	10-15				
			1,2,4,5-Tetrachlorobenzene	4.4		mg/kg
			1,2,4-Trichlorobenzene	210		mg/kg
			1,2-Dichlorobenzene	2.7	J	mg/kg
			1,3-Dichlorobenzene	2.4	J	mg/kg
			1,4-Dichlorobenzene	18		mg/kg
			2,4-Dimethylphenol	0.31	J	mg/kg
			2-Methylnaphthalene	2.6	J	mg/kg
			Acenaphthene	1.6	J	mg/kg
			Acenaphthylene	0.32	J	mg/kg
			Aniline	5.5		mg/kg
			Anthracene	1.4	J	mg/kg
			Benzo(a)anthracene	2.2	J	mg/kg
			Benzo(a)pyrene	1.6	J	mg/kg
			Benzo(b)fluoranthene	2.6	J	mg/kg
			Benzo(k)fluoranthene	1.2	J	mg/kg
			bis(2-Ethylhexyl) phthalate	1.3	J	mg/kg
			Chrysene	2.5	J	mg/kg
			Dibenzofuran	1.1	J	mg/kg
			Fluoranthene	4.7		mg/kg

Table 3-4 Detected SVOC Soil Concentrations, Newell Street Area II (continued).

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
			Fluorene	1.7		mg/kg
			Indeno(1,2,3-cd)pyrene	0.27	J	mg/kg
			N-Nitrosodiphenylamine	0.77	J	mg/kg
			Naphthalene	12		mg/kg
			Phenanthrene	7		mg/kg
			Pyrene	4		mg/kg
N2SC-04						
	CS1015	10-15				
			Acenaphthene	0.052	J	mg/kg
			Anthracene	0.14	J	mg/kg
			Benzo(a)anthracene	0.2	J	mg/kg
			Benzo(a)pyrene	0.17	J	mg/kg
			Benzo(b)fluoranthene	0.18	J	mg/kg
			Benzo(ghi)perylene	0.069	J	mg/kg
			Benzo(k)fluoranthene	0.095	J	mg/kg
			bis(2-Ethylhexyl) phthalate	0.49		mg/kg
			Chrysene	0.19	J	mg/kg
			Dibenzofuran	0.051	J	mg/kg
			Fluoranthene	0.59		mg/kg
			Fluorene	0.081	J	mg/kg
			Indeno(1,2,3-cd)pyrene	0.071	J	mg/kg
			Phenanthrene	0.55		mg/kg
			Pyrene	0.34	J	mg/kg
N2SC-05						
	CS1015	10-15				
			Benzo(a)pyrene	0.2	J	mg/kg
			bis(2-Ethylhexyl) phthalate	0.12	J	mg/kg
N2SC-06						
	CS1015	10-15				
			Acenaphthene	0.83	J	mg/kg
			Acenaphthylene	0.27	J	mg/kg
			Anthracene	0.17	J	mg/kg
			Benzo(a)anthracene	0.5	J	mg/kg
			Benzo(a)pyrene	0.7	J	mg/kg
			Benzo(b)fluoranthene	0.57	J	mg/kg
			Benzo(ghi)perylene	0.51	J	mg/kg
			Benzo(k)fluoranthene	0.25	J	mg/kg
			bis(2-Ethylhexyl) phthalate	0.43	J	mg/kg

Table 3-4 Detected SVOC Soil Concentrations, Newell Street Area II (continued).

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
			Chrysene	0.55	J	mg/kg
			Fluoranthene	0.72	J	mg/kg
			Fluorene	0.34	J	mg/kg
			Indeno(1,2,3-cd)pyrene	0.38	J	mg/kg
			Phenanthrene	0.36	J	mg/kg
			Pyrene	0.99	J	mg/kg
N2SC-07						
	CS1015	10-15				
			Benzo(a)anthracene	0.037	J	mg/kg
			Benzo(a)pyrene	0.052	J	mg/kg
			Benzo(b)fluoranthene	0.045	J	mg/kg
			bis(2-Ethylhexyl) phthalate	0.45		mg/kg
			Chrysene	0.045	J	mg/kg
			Fluoranthene	0.044	J	mg/kg
			Phenanthrene	0.038	J	mg/kg
			Pyrene	0.072	J	mg/kg

Qualifier

J *Result is between MDL and RL.*

Table 3-5 Detected Metals Soil Concentrations, Newell Street Area II.

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
N2SC-01						
	CS1015	10-15				
			Antimony	1	B	mg/kg
			Arsenic	5.9		mg/kg
			Barium	64.5		mg/kg
			Beryllium	0.48	B	mg/kg
			Cadmium	1.1		mg/kg
			Chromium	20.9		mg/kg
			Cobalt	13.6		mg/kg
			Copper	77.1		mg/kg
			Lead	145		mg/kg
			Mercury	0.036	B	mg/kg
			Nickel	19.9		mg/kg
			Selenium	1.2		mg/kg
			Thallium	1.4	B	mg/kg
			Tin	11.3	B	mg/kg
			Vanadium	15.1		mg/kg
			Zinc	305		mg/kg
N2SC-01I						
	13771					
			Antimony	0	B	mg/kg
			Arsenic	0	B	mg/kg
			Barium	1	B	mg/kg
			Chromium	0	B	mg/kg
			Copper	0	B	mg/kg
			Lead	1		mg/kg
			Mercury	0	B	mg/kg
			Tin	10		mg/kg
			Vanadium	0	B	mg/kg
N2SC-02						
	A0257					
			Barium	0	B	mg/kg
			Chromium	0	B	mg/kg
			Copper	1	B	mg/kg
			Lead	1		mg/kg
			Mercury	0	B	mg/kg
			Tin	2	B	mg/kg
			Zinc	1	B	mg/kg
	CS0306	3-6				
			Antimony	1.9		mg/kg
			Arsenic	12		mg/kg

Table 3-5 Detected Metals Soil Concentrations, Newell Street Area II (continued).

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
			Barium	682		mg/kg
			Beryllium	0.25	B	mg/kg
			Cadmium	7.1		mg/kg
			Chromium	81.1		mg/kg
			Cobalt	29.4		mg/kg
			Copper	845		mg/kg
			Lead	910		mg/kg
			Mercury	0.61		mg/kg
			Nickel	36.9		mg/kg
			Selenium	1.8		mg/kg
			Silver	9.1		mg/kg
			Tin	165		mg/kg
			Vanadium	27.8		mg/kg
			Zinc	3730		mg/kg
	CS0306 DUP	3-6				
			Antimony	2.5		mg/kg
			Arsenic	11.3		mg/kg
			Barium	817		mg/kg
			Beryllium	0.26		mg/kg
			Cadmium	11.7		mg/kg
			Chromium	34		mg/kg
			Cobalt	14.5		mg/kg
			Copper	1530		mg/kg
			Lead	1060		mg/kg
			Nickel	34.1		mg/kg
			Selenium	0.76		mg/kg
			Silver	85.3		mg/kg
			Tin	181		mg/kg
			Vanadium	17.5		mg/kg
			Zinc	3140		mg/kg
	CS3436	34-36				
			Antimony	0.24	B	mg/kg
			Arsenic	9.7		mg/kg
			Barium	12.7	B	mg/kg
			Beryllium	0.063	B	mg/kg
			Cadmium	0.02	B	mg/kg
			Chromium	6.5		mg/kg
			Cobalt	8.6		mg/kg
			Copper	22.1		mg/kg
			Lead	8.2		mg/kg
			Mercury	0.018	B	mg/kg

Table 3-5 Detected Metals Soil Concentrations, Newell Street Area II (continued).

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
			Nickel	13.7		mg/kg
			Vanadium	4.8	B	mg/kg
			Zinc	37.3		mg/kg
N2SC-03						
	CS1015	10-15				
			Antimony	0.9	B	mg/kg
			Arsenic	3.9		mg/kg
			Barium	57.2		mg/kg
			Beryllium	0.32	B	mg/kg
			Cadmium	0.38	B	mg/kg
			Chromium	27.8		mg/kg
			Cobalt	9.1	B	mg/kg
			Copper	138		mg/kg
			Lead	221		mg/kg
			Mercury	0.32		mg/kg
			Nickel	21.2		mg/kg
			Selenium	0.86	B	mg/kg
			Silver	0.14	B	mg/kg
			Tin	11.1	B	mg/kg
			Vanadium	12.1		mg/kg
			Zinc	225		mg/kg
	CS1015 DUP	10-15				
			Antimony	1.7		mg/kg
			Arsenic	4		mg/kg
			Barium	70.8		mg/kg
			Beryllium	0.38		mg/kg
			Cadmium	0.48		mg/kg
			Chromium	15.6		mg/kg
			Cobalt	9.3		mg/kg
			Copper	113		mg/kg
			Lead	351		mg/kg
			Nickel	20.6		mg/kg
			Selenium	1.2		mg/kg
			Silver	0.1		mg/kg
			Tin	9.8		mg/kg
			Vanadium	13.6		mg/kg
			Zinc	217		mg/kg
N2SC-03I						
	13773					
			Antimony	0	B	mg/kg
			Barium	1	B	mg/kg

Table 3-5 Detected Metals Soil Concentrations, Newell Street Area II (continued).

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
			Chromium	0	B	mg/kg
			Copper	2	B	mg/kg
			Lead	2		mg/kg
			Mercury	0	B	mg/kg
			Tin	6	B	mg/kg
			Vanadium	0	B	mg/kg
N2SC-03S						
	13772					
			Antimony	0	B	mg/kg
			Arsenic	1		mg/kg
			Barium	1	B	mg/kg
			Chromium	1	B	mg/kg
			Copper	6		mg/kg
			Lead	6		mg/kg
			Mercury	0	B	mg/kg
			Nickel	3	B	mg/kg
			Silver	0	B	mg/kg
			Tin	7	B	mg/kg
			Vanadium	1	B	mg/kg
			Zinc	2	B	mg/kg
N2SC-04						
	CS1015	10-15				
			Antimony	0.25	B	mg/kg
			Arsenic	1.3		mg/kg
			Barium	323		mg/kg
			Beryllium	0.17	B	mg/kg
			Cadmium	0.041	B	mg/kg
			Chromium	6.5		mg/kg
			Cobalt	6	B	mg/kg
			Copper	9.1		mg/kg
			Lead	117		mg/kg
			Mercury	0.026	B	mg/kg
			Nickel	8.4		mg/kg
			Vanadium	5.7	B	mg/kg
			Zinc	61.7		mg/kg
N2SC-05						
	CS1015	10-15				
			Antimony	0.35	B	mg/kg
			Arsenic	1.4	B	mg/kg
			Barium	21.2	B	mg/kg
			Beryllium	0.22	B	mg/kg

Table 3-5 Detected Metals Soil Concentrations, Newell Street Area II (continued).

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
			Cadmium	0.059	B	mg/kg
			Chromium	7.5		mg/kg
			Cobalt	6.6	B	mg/kg
			Copper	8.2		mg/kg
			Lead	4.1		mg/kg
			Mercury	0.024	B	mg/kg
			Nickel	9.6		mg/kg
			Selenium	0.54	B	mg/kg
			Thallium	0.84	B	mg/kg
			Vanadium	7	B	mg/kg
			Zinc	41.6		mg/kg
	CS1015 DUP	10-15				
			Antimony	0.37		mg/kg
			Arsenic	1.8		mg/kg
			Barium	23.5		mg/kg
			Beryllium	0.24		mg/kg
			Cadmium	0.09		mg/kg
			Chromium	8.1		mg/kg
			Cobalt	7		mg/kg
			Copper	8.7		mg/kg
			Lead	4.5		mg/kg
			Nickel	11		mg/kg
			Vanadium	7.7		mg/kg
			Zinc	42		mg/kg
N2SC-06						
	CS1015	10-15				
			Antimony	0.73	B	mg/kg
			Arsenic	2.4		mg/kg
			Barium	43.8		mg/kg
			Beryllium	0.26	B	mg/kg
			Cadmium	0.39	B	mg/kg
			Chromium	12.6		mg/kg
			Cobalt	8.6		mg/kg
			Copper	167		mg/kg
			Lead	94.5		mg/kg
			Mercury	0.21		mg/kg
			Nickel	13		mg/kg
			Selenium	0.3	B	mg/kg
			Silver	0.09	B	mg/kg
			Thallium	1.2	B	mg/kg
			Tin	13.3		mg/kg

Table 3-5 Detected Metals Soil Concentrations, Newell Street Area II (continued).

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
			Vanadium	9.7		mg/kg
			Zinc	201		mg/kg
	CS1015 DUP	10-15				
			Antimony	0.59		mg/kg
			Arsenic	2.7		mg/kg
			Barium	44.1		mg/kg
			Beryllium	0.28		mg/kg
			Cadmium	0.39		mg/kg
			Chromium	12.3		mg/kg
			Cobalt	9.2		mg/kg
			Copper	187		mg/kg
			Lead	84.7		mg/kg
			Mercury	0.26		mg/kg
			Nickel	15.9		mg/kg
			Thallium	1.4		mg/kg
			Tin	13.1		mg/kg
			Vanadium	9.3		mg/kg
			Zinc	210		mg/kg
N2SC-07						
	CS1015	10-15				
			Arsenic	2.6		mg/kg
			Barium	15.2	B	mg/kg
			Beryllium	0.19	B	mg/kg
			Cadmium	0.06	B	mg/kg
			Chromium	7.5		mg/kg
			Cobalt	7.3		mg/kg
			Copper	10.5		mg/kg
			Lead	7.6		mg/kg
			Mercury	0.02	B	mg/kg
			Nickel	10.5		mg/kg
			Selenium	0.28	B	mg/kg
			Thallium	0.95	B	mg/kg
			Vanadium	6.8		mg/kg
			Zinc	44.5		mg/kg

Qualifier

B Result is between MDL and RL

Table 3-6 Detected Dioxin and Furan Soil Concentrations, Newell Street Area II.

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Qualifier*	*Units*
N2SC-01	CS1015	10-15				
			1,2,3,4,6,7,8-HpCDD	0.00013		ug/kg
			1,2,3,4,6,7,8-HpCDF	0.00063		ug/kg
			1,2,3,4,7,8,9-HpCDF	0.00042		ug/kg
			1,2,3,4,7,8-HxCDD	0.000027		ug/kg
			1,2,3,4,7,8-HxCDF	0.00099		ug/kg
			1,2,3,6,7,8-HxCDD	0.000013		ug/kg
			1,2,3,6,7,8-HxCDF	0.00034		ug/kg
			1,2,3,7,8,9-HxCDD	0.0000085		ug/kg
			1,2,3,7,8,9-HxCDF	0.00002	F	ug/kg
			1,2,3,7,8-PeCDD	0.000013		ug/kg
			1,2,3,7,8-PeCDF	0.000052		ug/kg
			2,3,4,6,7,8-HxCDF	0.000083		ug/kg
			2,3,4,7,8-PeCDF	0.00018		ug/kg
			2,3,7,8-TCDD	0.0000019		ug/kg
			2,3,7,8-TCDF	0.000046	g	ug/kg
			HpCDDs (total)	0.00025		ug/kg
			HpCDFs (total)	0.0021		ug/kg
			HxCDDs (total)	0.00017		ug/kg
			HxCDFs (total)	0.0035		ug/kg
			OCDD	0.00058		ug/kg
			OCDF	0.00067		ug/kg
			PeCDDs (total)	0.000034		ug/kg
			PeCDFs (total)	0.0017		ug/kg
			TCDDs (total)	0.000026		ug/kg
			TCDFs (total)	0.00037		ug/kg
N2SC-02	CS0306	3-6				
			1,2,3,4,6,7,8-HpCDD	0.0017		ug/kg
			1,2,3,4,6,7,8-HpCDF	0.0033	E	ug/kg
			1,2,3,4,7,8,9-HpCDF	0.0014		ug/kg
			1,2,3,4,7,8-HxCDD	0.00011		ug/kg
			1,2,3,6,7,8-HxCDD	0.00017		ug/kg
			1,2,3,6,7,8-HxCDF	0.0011		ug/kg
			1,2,3,7,8,9-HxCDD	0.00014		ug/kg
			1,2,3,7,8,9-HxCDF	0.00014		ug/kg
			1,2,3,7,8-PeCDD	0.000069		ug/kg
			1,2,3,7,8-PeCDF	0.0028	E	ug/kg
			2,3,4,6,7,8-HxCDF	0.00034		ug/kg
			2,3,4,7,8-PeCDF	0.002		ug/kg

Table 3-6 Detected Dioxin and Furan Soil Concentrations, Newell Street Area II (continued).

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Qualifier*	*Units*
			2,3,7,8-TCDD	0.000015		ug/kg
			2,3,7,8-TCDF	0.0073	Dg	ug/kg
			HpCDDs (total)	0.0044		ug/kg
			HpCDFs (total)	0.0075		ug/kg
			HxCDDs (total)	0.0031		ug/kg
			HxCDFs (total)	0.01		ug/kg
			OCDD	0.0068	E	ug/kg
			OCDF	0.0039		ug/kg
			PeCDDs (total)	0.00084		ug/kg
			PeCDFs (total)	0.015		ug/kg
			TCDDs (total)	0.00082		ug/kg
			TCDFs (total)	0.038		ug/kg
			1,2,3,4,6,7,8-HpCDD	0.013	E	ug/kg
			1,2,3,4,6,7,8-HpCDF	0.011	E	ug/kg
			1,2,3,4,7,8,9-HpCDF	0.011	E	ug/kg
			1,2,3,4,7,8-HxCDD	0.002		ug/kg
			1,2,3,4,7,8-HxCDF	0.03	E	ug/kg
			1,2,3,6,7,8-HxCDD	0.0088	E	ug/kg
			1,2,3,6,7,8-HxCDF	0.0092	E	ug/kg
			1,2,3,7,8,9-HxCDD	0.005	E	ug/kg
			1,2,3,7,8,9-HxCDF	0.00032		ug/kg
			1,2,3,7,8-PeCDD	0.0037	E	ug/kg
			1,2,3,7,8-PeCDF	0.0023	E	ug/kg
			2,3,4,6,7,8-HxCDF	0.0021		ug/kg
			2,3,4,7,8-PeCDF	0.0078	E	ug/kg
			2,3,7,8-TCDD	0.00032		ug/kg
			2,3,7,8-TCDF	0.0017	gE	ug/kg
			HpCDDs (total)	0.028		ug/kg
			HpCDFs (total)	0.036		ug/kg
			HxCDDs (total)	0.093		ug/kg
			HxCDFs (total)	0.082		ug/kg
			OCDD	0.011	E	ug/kg
			OCDF	0.011	E	ug/kg
			PeCDDs (total)	0.039		ug/kg
			PeCDFs (total)	0.066		ug/kg
			TCDDs (total)	0.014		ug/kg
			TCDFs (total)	0.026		ug/kg
N2SC-03	CS1015	10-15				
			1,2,3,4,6,7,8-HpCDD	0.0000015	s	ug/kg

Table 3-6 Detected Dioxin and Furan Soil Concentrations, Newell Street Area II (continued).

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Qualifier*	*Units*
			1,2,3,4,6,7,8-HpCDF	0.00001		ug/kg
			1,2,3,4,7,8,9-HpCDF	0.0000067		ug/kg
			1,2,3,4,7,8-HxCDF	0.000027		ug/kg
			1,2,3,7,8,9-HxCDF	0.0000049		ug/kg
			2,3,4,6,7,8-HxCDF	0.0000067		ug/kg
			HpCDDs (total)	0.0000029		ug/kg
			HpCDFs (total)	0.000032		ug/kg
			HxCDFs (total)	0.000068		ug/kg
			OCDD	0.0000063	a	ug/kg
			OCDF	0.0000063	a	ug/kg
			PeCDFs (total)	0.000044		ug/kg
			TCDFs (total)	0.0000092		ug/kg
N2SC-04	CS1015	10-15				
			1,2,3,4,6,7,8-HpCDD	0.0000048	j	ug/kg
			1,2,3,4,6,7,8-HpCDF	0.000033		ug/kg
			1,2,3,4,7,8,9-HpCDF	0.0000083		ug/kg
			1,2,3,4,7,8-HxCDF	0.000031		ug/kg
			1,2,3,6,7,8-HxCDF	0.000016		ug/kg
			1,2,3,7,8-PeCDF	0.0000091		ug/kg
			2,3,4,6,7,8-HxCDF	0.0000042	j	ug/kg
			2,3,4,7,8-PeCDF	0.000012		ug/kg
			2,3,7,8-TCDD	6.9E-07	j	ug/kg
			2,3,7,8-TCDF	0.000013	g	ug/kg
			HpCDDs (total)	0.000011		ug/kg
			HpCDFs (total)	0.000064		ug/kg
			HxCDDs (total)	0.0000077		ug/kg
			HxCDFs (total)	0.00012		ug/kg
			OCDD	0.000012	j	ug/kg
			OCDF	0.00004		ug/kg
			PeCDFs (total)	0.00014		ug/kg
			TCDDs (total)	0.0000036		ug/kg
			TCDFs (total)	0.00013		ug/kg
N2SC-06	CS1015	10-15				
			1,2,3,4,6,7,8-HpCDD	0.000029		ug/kg
			1,2,3,4,6,7,8-HpCDF	0.00027		ug/kg
			1,2,3,4,7,8,9-HpCDF	0.000096		ug/kg
			1,2,3,4,7,8-HxCDF	0.00026		ug/kg
			1,2,3,6,7,8-HxCDD	0.0000041	j	ug/kg
			1,2,3,6,7,8-HxCDF	0.00014		ug/kg

Table 3-6 Detected Dioxin and Furan Soil Concentrations, Newell Street Area II (continued).

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Qualifier*	*Units*
			1,2,3,7,8,9-HxCDD	0.0000075		ug/kg
			1,2,3,7,8,9-HxCDF	0.0000044	j	ug/kg
			1,2,3,7,8-PeCDF	0.000053		ug/kg
			2,3,4,6,7,8-HxCDF	0.000029		ug/kg
			2,3,4,7,8-PeCDF	0.00007		ug/kg
			2,3,7,8-TCDF	0.00015	g	ug/kg
			HpCDDs (total)	0.000064		ug/kg
			HpCDFs (total)	0.00052		ug/kg
			HxCDDs (total)	0.000059		ug/kg
			HxCDFs (total)	0.0011		ug/kg
			OCDD	0.00009		ug/kg
			OCDF	0.00028		ug/kg
			PeCDDs (total)	0.0000048		ug/kg
			PeCDFs (total)	0.0012		ug/kg
			TCDDs (total)	0.000024		ug/kg
			TCDFs (total)	0.0014		ug/kg
N2SC-07	CS1015	10-15				
			1,2,3,4,6,7,8-HpCDD	0.0000051	j	ug/kg
			1,2,3,4,6,7,8-HpCDF	0.000038		ug/kg
			1,2,3,4,7,8,9-HpCDF	0.000015		ug/kg
			1,2,3,4,7,8-HxCDF	0.000054		ug/kg
			1,2,3,6,7,8-HxCDF	0.000041		ug/kg
			1,2,3,7,8-PeCDF	0.000022		ug/kg
			2,3,4,6,7,8-HxCDF	0.0000076		ug/kg
			2,3,4,7,8-PeCDF	0.000026		ug/kg
			2,3,7,8-TCDF	0.000022	g	ug/kg
			HpCDDs (total)	0.000012		ug/kg
			HpCDFs (total)	0.000076		ug/kg
			HxCDDs (total)	0.0000053		ug/kg
			HxCDFs (total)	0.00022		ug/kg
			OCDD	0.00001	j	ug/kg
			OCDF	0.000032		ug/kg
			PeCDFs (total)	0.00033		ug/kg
			TCDDs (total)	8.1E-07		ug/kg
			TCDFs (total)	0.00029		ug/kg
			1,2,3,4,6,7,8-HpCDD	0.0000027		ug/kg
			1,2,3,4,6,7,8-HpCDF	0.0000036		ug/kg
			1,2,3,4,7,8,9-HpCDF	0.0000029		ug/kg
			1,2,3,4,7,8-HxCDF	0.000011		ug/kg

Table 3-6 Detected Dioxin and Furan Soil Concentrations, Newell Street Area II (continued).

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Qualifier*	*Units*
			1,2,3,6,7,8-HxCDD	0.0000021		ug/kg
			1,2,3,7,8,9-HxCDD	8.9E-07	s	ug/kg
			1,2,3,7,8,9-HxCDF	0.0000027		ug/kg
			2,3,4,6,7,8-HxCDF	0.0000022		ug/kg
			HpCDDs (total)	0.000006		ug/kg
			HpCDFs (total)	0.000012		ug/kg
			HxCDDs (total)	0.000017		ug/kg
			HxCDFs (total)	0.000025		ug/kg
			OCDD	0.0000034	a	ug/kg
			OCDF	0.0000037	sa	ug/kg
			PeCDDs (total)	0.0000045	a	ug/kg
			PeCDFs (total)	0.000017		ug/kg
			TCDFs (total)	0.000064		ug/kg

Qualifier

- j *Result is an estimated value that is below the lower calibration limit but above the target detection level.*
- *g* *2, 3, 7, 8, -TCDF results have been confirmed on a DB-225 column.*
- *E* *Result exceeds calibration range.*
- *F* *Reported value estimated due to an interference.*
- *a* *See narrative.*
- *s* *Result detected is below the lowest standard and above zero.*
- *D* *Compound quantified using a secondary dilution.*

Table 3-7 Summary of DNAPL Analyses, Newell Street Area II.

Analysis	*Location*	*Sample Name*	*Compound*	*Result*	*Qual*	*Units*
PCBs						
	N2SC-01I					
		13771				
			Aroclor 1254	290000		mg/kg
			Total PCBs	**290000**		mg/kg
	N2SC-02					
		A0257				
			Aroclor 1254	320000		mg/kg
			Total PCBs	**320000**		mg/kg
	N2SC-03I					
		13773				
			Aroclor 1254	300000		mg/kg
			Total PCBs	**300000**		mg/kg
	N2SC-03S					
		13772				
			Aroclor 1254	290000		mg/kg
			Total PCBs	**290000**		mg/kg
VOC						
	N2SC-01I					
		13771				
			cis-1,2-Dichloroethene	1100	J	mg/kg
			Tetrachloroethene	2800		mg/kg
			Toluene	2700		mg/kg
			Trichloroethene	56000		mg/kg
			Xylenes (total)	5500		mg/kg
	N2SC-02					
		A0257				
			Tetrachloroethene	2100	J	mg/kg
			Toluene	2400	J	mg/kg
			Trichloroethene	66000		mg/kg
			Xylenes (total)	6900		mg/kg
	N2SC-03I					
		13773				
			Toluene	1600	J	mg/kg
			Trichloroethene	62000		mg/kg
			Xylenes (total)	6300		mg/kg
	N2SC-03S					
		13772				
			cis-1,2-Dichloroethene	4800		mg/kg

Table 3-7 Summary of DNAPL Analyses, Newell Street Area II (continued).

Analysis	*Location*	*Sample Name*	*Compound*	*Result*	*Qual*	*Units*
			Toluene	1600	J	mg/kg
			Trichloroethene	69000		mg/kg
SVOC						
	N2SC-01I					
		13771				
			1,2,4,5-Tetrachlorobenzen	970	J	mg/kg
			1,2,4-Trichlorobenzene	31000		mg/kg
			1,2-Dichlorobenzene	580	J	mg/kg
			1,4-Dichlorobenzene	1200		mg/kg
			2-Methylnaphthalene	110	J	mg/kg
			Naphthalene	230	J	mg/kg
			Pentachlorobenzene	260	J	mg/kg
	N2SC-02					
		A0257				
			1,2,4,5-Tetrachlorobenzen	670	J	mg/kg
			1,2,4-Trichlorobenzene	24000		mg/kg
			1,2-Dichlorobenzene	460	J	mg/kg
			1,4-Dichlorobenzene	1100		mg/kg
			2-Methylnaphthalene	100	J	mg/kg
			Naphthalene	200	J	mg/kg
			Pentachlorobenzene	59	J	mg/kg
	N2SC-03I					
		13773				
			1,2,4,5-Tetrachlorobenzen	360	J	mg/kg
			1,2,4-Trichlorobenzene	16000		mg/kg
			1,2-Dichlorobenzene	280	J	mg/kg
			1,4-Dichlorobenzene	650	J	mg/kg
			2-Methylnaphthalene	110	J	mg/kg
			Fluoranthene	55	J	mg/kg
			Naphthalene	260	J	mg/kg
			Phenanthrene	79	J	mg/kg
	N2SC-03S					
		13772				
			1,2,4,5-Tetrachlorobenzen	250	J	mg/kg
			1,2,4-Trichlorobenzene	13000		mg/kg
			1,2-Dichlorobenzene	170	J	mg/kg

Table 3-7 Summary of DNAPL Analyses, Newell Street Area II (continued).

Analysis	*Location*	*Sample Name*	*Compound*	*Result*	*Qual*	*Units*
			1,4-Dichlorobenzene	140	J	mg/kg
			2-Methylnaphthalene	110	J	mg/kg
			Acenaphthene	83	J	mg/kg
			Anthracene	59	J	mg/kg
			Benzo(a)anthracene	100	J	mg/kg
			Benzo(a)pyrene	61	J	mg/kg
			Benzo(b)fluoranthene	120	J	mg/kg
			Benzo(k)fluoranthene	60	J	mg/kg
			Chrysene	97	J	mg/kg
			Dibenzofuran	53	J	mg/kg
			Fluoranthene	320	J	mg/kg
			Fluorene	87	J	mg/kg
			Naphthalene	670	J	mg/kg
			Phenanthrene	360	J	mg/kg
			Pyrene	180	J	mg/kg
Metals						
	N2SC-01I					
		13771				
			Antimony	0	B	mg/kg
			Arsenic	0	B	mg/kg
			Barium	1	B	mg/kg
			Chromium	0	B	mg/kg
			Copper	0	B	mg/kg
			Lead	1		mg/kg
			Mercury	0	B	mg/kg
			Tin	10		mg/kg
			Vanadium	0	B	mg/kg
	N2SC-02					
		A0257				
			Barium	0	B	mg/kg
			Chromium	0	B	mg/kg
			Copper	1	B	mg/kg
			Lead	1		mg/kg
			Mercury	0	B	mg/kg
			Tin	2	B	mg/kg
			Zinc	1	B	mg/kg

Table 3-7 Summary of DNAPL Analyses, Newell Street Area II (continued).

Analysis	*Location*	*Sample Name*	*Compound*	*Result*	*Qual*	*Units*
	N2SC-03I					
		13773				
			Antimony	0	B	mg/kg
			Barium	1	B	mg/kg
			Chromium	0	B	mg/kg
			Copper	2	B	mg/kg
			Lead	2		mg/kg
			Mercury	0	B	mg/kg
			Tin	6	B	mg/kg
			Vanadium	0	B	mg/kg
	N2SC-03S					
		13772				
			Antimony	0	B	mg/kg
			Arsenic	1		mg/kg
			Barium	1	B	mg/kg
			Chromium	1	B	mg/kg
			Copper	6		mg/kg
			Lead	6		mg/kg
			Mercury	0	B	mg/kg
			Nickel	3	B	mg/kg
			Silver	0	B	mg/kg
			Tin	7	B	mg/kg
			Vanadium	1	B	mg/kg
			Zinc	2	B	mg/kg

Qualifier

a *Matrix spike percent recovery outside of QC limits. For Dioxins: See narrative.*

B *For organics, compound found in method blank. For metals: Result is between MDL and RL*

D *Compound quantified using a secondary dilution.*

E *Result exceeds calibration range.*

J *For organics, result is between MDL and RL.*

Table 3-8 Summary of Water Level and NAPL Measurements, Newell Street Area II.

Boring	*Date Measured*	*Measuring Point Elevation*	*Depth to LNAPL*	*Depth to Water*	*Groundwater Elevation*	*LNAPL Thickness*	*Depth to DNAPL*	*DNAPL Elevation*	*Notes*
N2SC-01I									
	11/4/98	984.99		13.62	971.37		35.48	949.51	
	11/6/98	984.99		13.64	971.35		35.43	949.56	
	11/9/98	984.99		13.71	971.28		35.43	949.56	
	11/13/98	984.99		13.38	971.61		35.24	949.75	
	11/25/98	984.99		13.66	971.33		35.28	949.71	
	12/8/98	984.99		13.62	971.37		35.41	949.58	
	12/17/98	984.99		13.71	971.28				DNAPL on bottom 5 feet of probe tape
	12/29/98	984.99	13.63	13.64	971.35	0.01	36.32	948.67	Well not screened across water table
	1/7/99	984.99		13.70	971.29		35.35	949.64	
N2SC-01S									
	11/4/98	985.1		10.96	974.14				
	11/6/98	985.1		11.00	974.10				
	11/9/98	985.1		11.02	974.08				Trace Sheen on probe
	11/13/98	985.1		11.11	973.99				
	11/25/98	985.1		11.12	973.98				
	12/8/98	985.1		10.87	974.23				
	12/17/98	985.1		13.91	971.19				
	12/29/98	985.1		11.02	974.08				
	1/7/99	985.1		11.13	973.97				
	1/22/99	985.1		10.72	974.38				
	1/29/99	985.1		10.69	974.41				
	2/5/99	985.1		9.91	975.19				
N2SC-02									
	11/6/98	985.07		13.82	971.25		34.95	950.12	
	11/9/98	985.07		13.90	971.17		34.89	950.18	

Table 3-8 Summary of Water Level and NAPL Measurements, Newell Street Area II (continued).

Boring	*Date Measured*	*Measuring Point Elevation*	*Depth to LNAPL*	*Depth to Water*	*Groundwater Elevation*	*LNAPL Thickness*	*Depth to DNAPL*	*DNAPL Elevation*	*Notes*
	11/13/98	985.07		13.53	971.54		34.76	950.31	
	11/25/98	985.07		13.82	971.25		34.86	950.21	
	12/8/98	985.07		13.29	971.78		34.90	950.17	
	12/17/98	985.07		13.86	971.21		35.00	950.07	
	12/29/98	985.07		13.80	971.27		35.94	949.13	
	1/7/99	985.07							Not measured, pump in well.
N2SC-031									
	11/4/98	985.33		13.88	971.45				Sheen on probe
	11/6/98	985.33		13.97	971.36				Sheen on probe
	11/9/98	985.33		13.97	971.36				Sheen on probe
	11/13/98	985.33		13.62	971.71		36.64	948.69	
	11/25/98	985.33		13.90	971.43		36.51	948.82	
	12/8/98	985.33		13.85	971.48		36.61	948.72	
	12/17/98	985.33		13.93	971.40				DNAPL on last 4.0 feet of probe tape
	12/29/98	985.33							Not measured, pump in well
	1/7/99	985.33							Not measured, pump in well.
N2SC-03S									
	11/4/98	985.18		11.99	973.19				Sheen on probe
	11/6/98	985.18		11.91	973.27				
	11/9/98	985.18		11.99	973.19				Trace Sheen on probe
	11/13/98	985.18		12.30	972.88		19.91	965.27	
	11/25/98	985.18		12.74	972.44		20.70	964.48	
	12/8/98	985.18		12.25	972.93		21.38	963.80	
	12/17/98	985.18		11.19	973.99				Well recently bailed, DNAPL on tape
	12/29/98	985.18		12.05	973.13				DNAPL On probe
	1/7/99	985.18		12.00	973.18				Sheen on probe

Table 3-8 Summary of Water Level and NAPL Measurements, Newell Street Area II (continued).

Boring	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
	1/22/99	985.18		11.98	973.20				DNAPL on tip probe
	1/29/99	985.18		12.01	973.17				DNAPL on tip probe
	2/5/99	985.18		11.11	974.07				NAPL on probe
N2SC-04									
	11/9/98	981.56		10.62	970.94				Sheen on probe
	11/13/98	981.56		10.19	971.37				
	11/25/98	981.56		10.47	971.09				
	12/8/98	981.56		10.41	971.15				
	12/17/98	981.56		10.50	971.06				
	12/29/98	981.56		10.44	971.12				
	1/7/99	981.56		10.47	971.09				
	1/22/99	981.56		9.34	972.22				
	1/29/99	981.56		9.28	972.28				
	2/5/99	981.56		8.56	973.00				
N2SC-05									
	11/9/98	982.54		11.57	970.97				
	11/13/98	982.54		11.27	971.27				
	11/25/98	982.54		11.46	971.08				
	12/8/98	982.54		11.41	971.13				
	12/17/98	982.54		11.52	971.02				
	12/29/98	982.54		11.43	971.11				
	1/7/99	982.54		11.45	971.09				
	1/22/99	982.54		10.37	972.17				
	1/29/99	982.54		10.11	972.43				
	2/5/99	982.54		9.64	972.90				
N2SC-06									
	11/6/98	985.27		14.10	971.17				

Table 3-8 Summary of Water Level and NAPL Measurements, Newell Street Area II (continued).

Boring	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
	11/9/98	985.27		14.14	971.13				
	11/13/98	985.27		13.81	971.46				
	11/25/98	985.27		14.08	971.19				
	12/8/98	985.27		14.03	971.24				
	12/17/98	985.27		14.14	971.13				
	12/29/98	985.27		14.06	971.21				
	1/7/99	985.27		14.10	971.17				
	1/22/99	985.27		12.93	972.34				
	1/29/99	985.27		12.64	972.63				
	2/5/99	985.27		12.06	973.21				
N2SC-07									
	11/13/98	984.61		13.24	971.37				
	11/25/98	984.61		13.52	971.09				
	12/8/98	984.61		13.48	971.13				
	12/17/98	984.61		13.55	971.06				
	12/29/98	984.61		13.52	971.09				
	1/7/99	984.61		13.53	971.08				
	1/22/99	984.61		12.42	972.19		31.80	952.81	
	1/29/99	984.61		12.21	972.40		32.45	952.16	
	2/5/99	984.61		11.57	973.04		33.70	950.91	

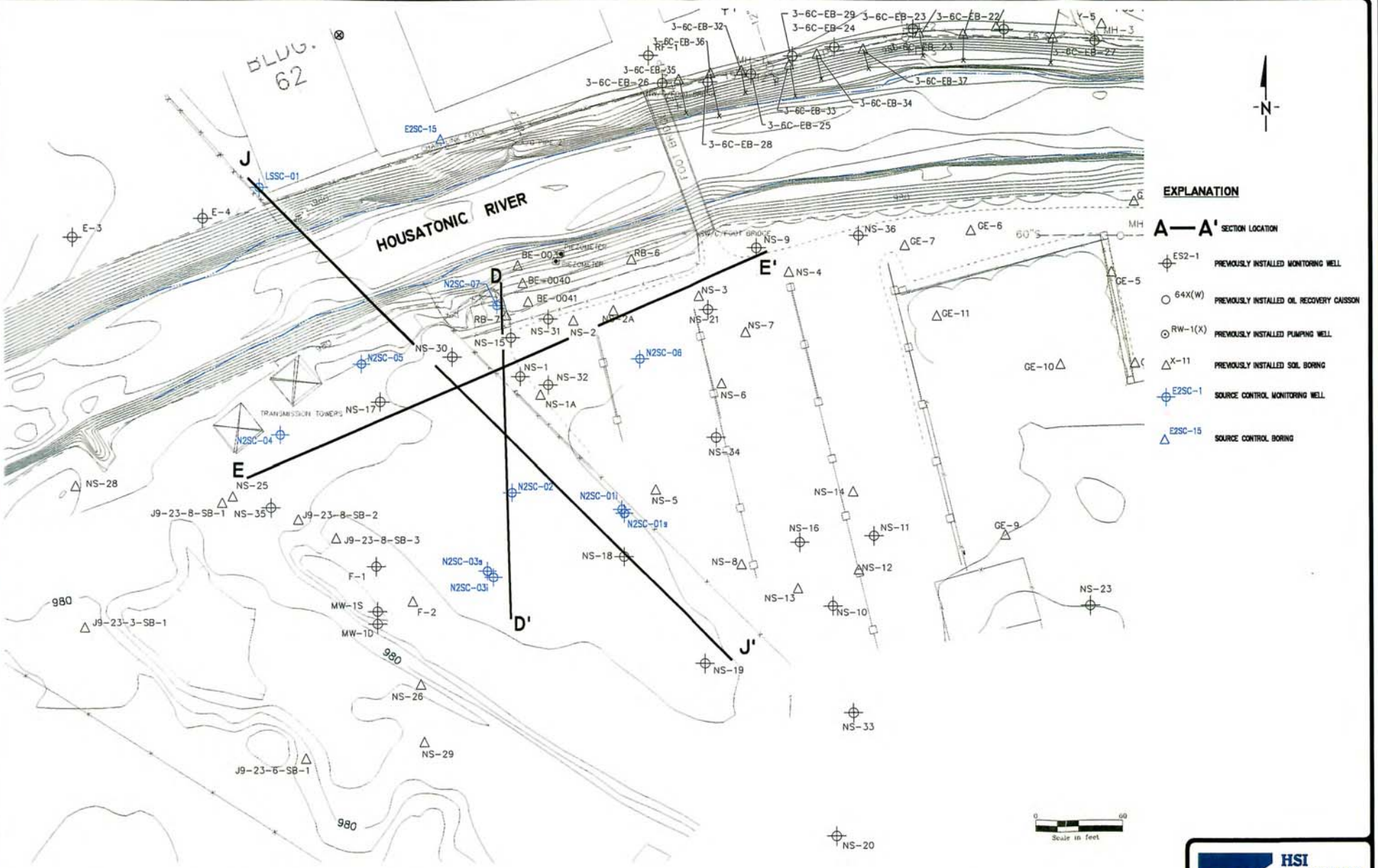


Figure 3-1 Newell Street Area II Well and Boring Location Map

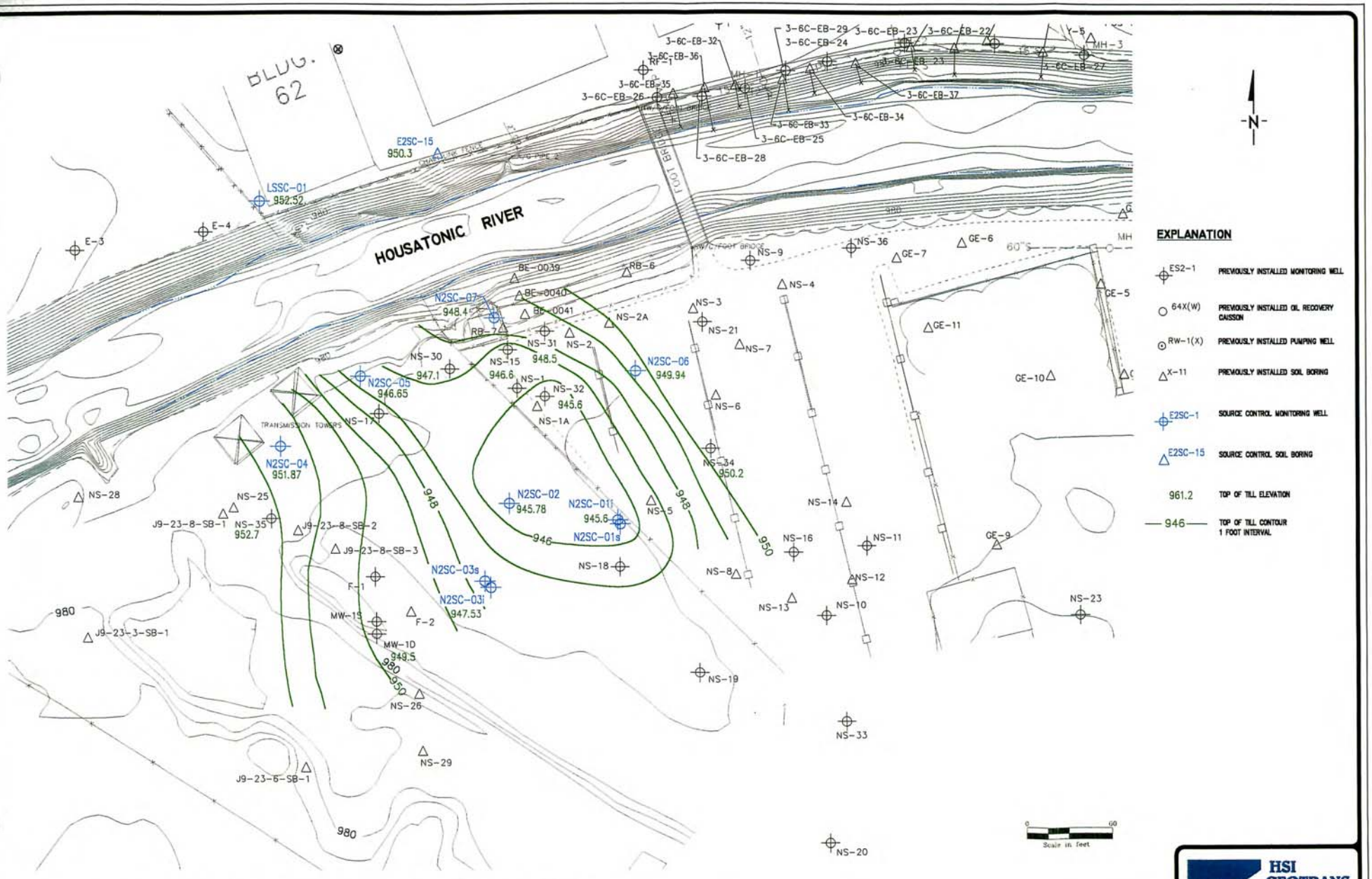


Figure 3-2 Detailed Top of Till Elevation Contour Map, Newell Street Area II

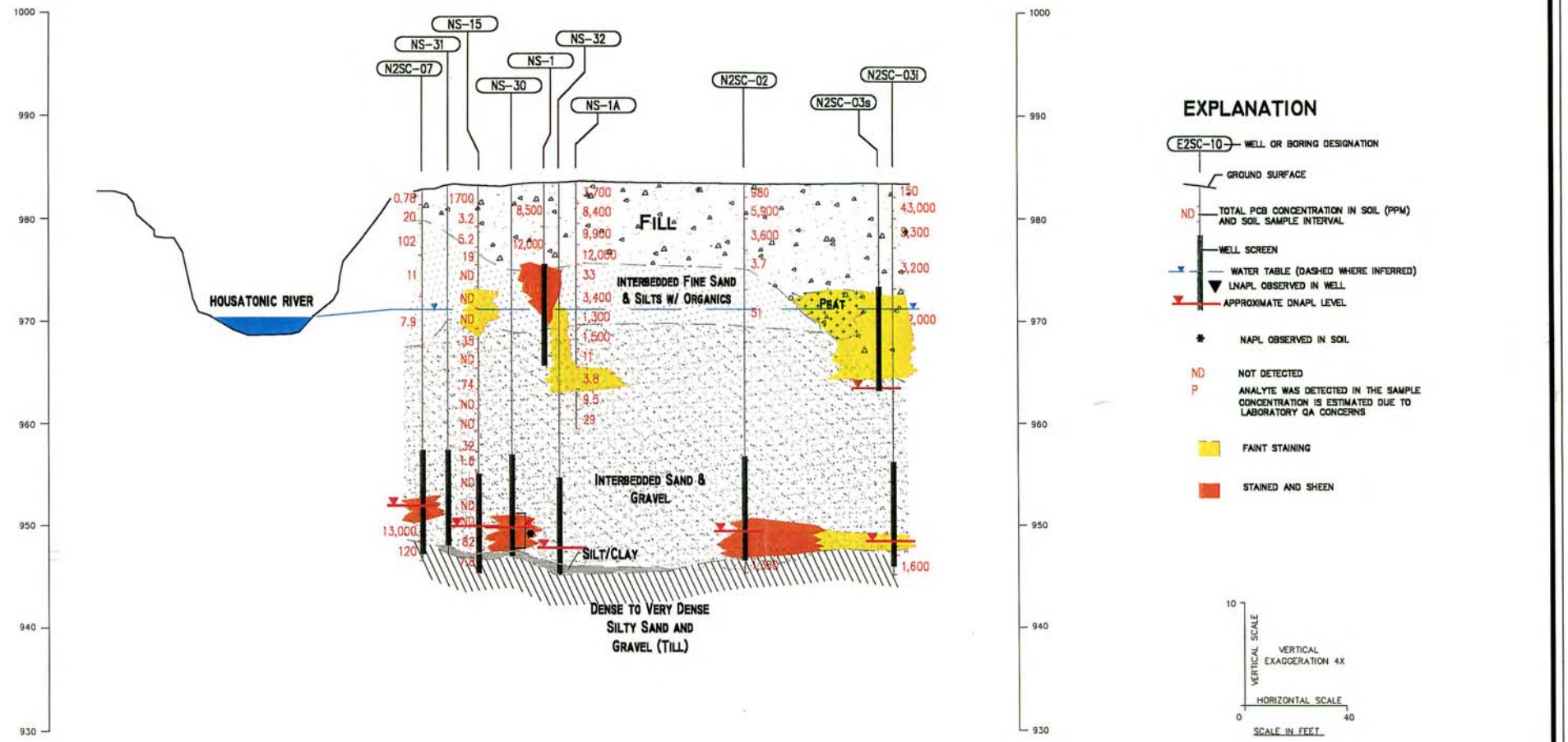


Figure 3-3 Cross-Section D-D', Newell Street Area II

HSI GEOTRANS
A TETRA TECH COMPANY
9901-e-D.dwg

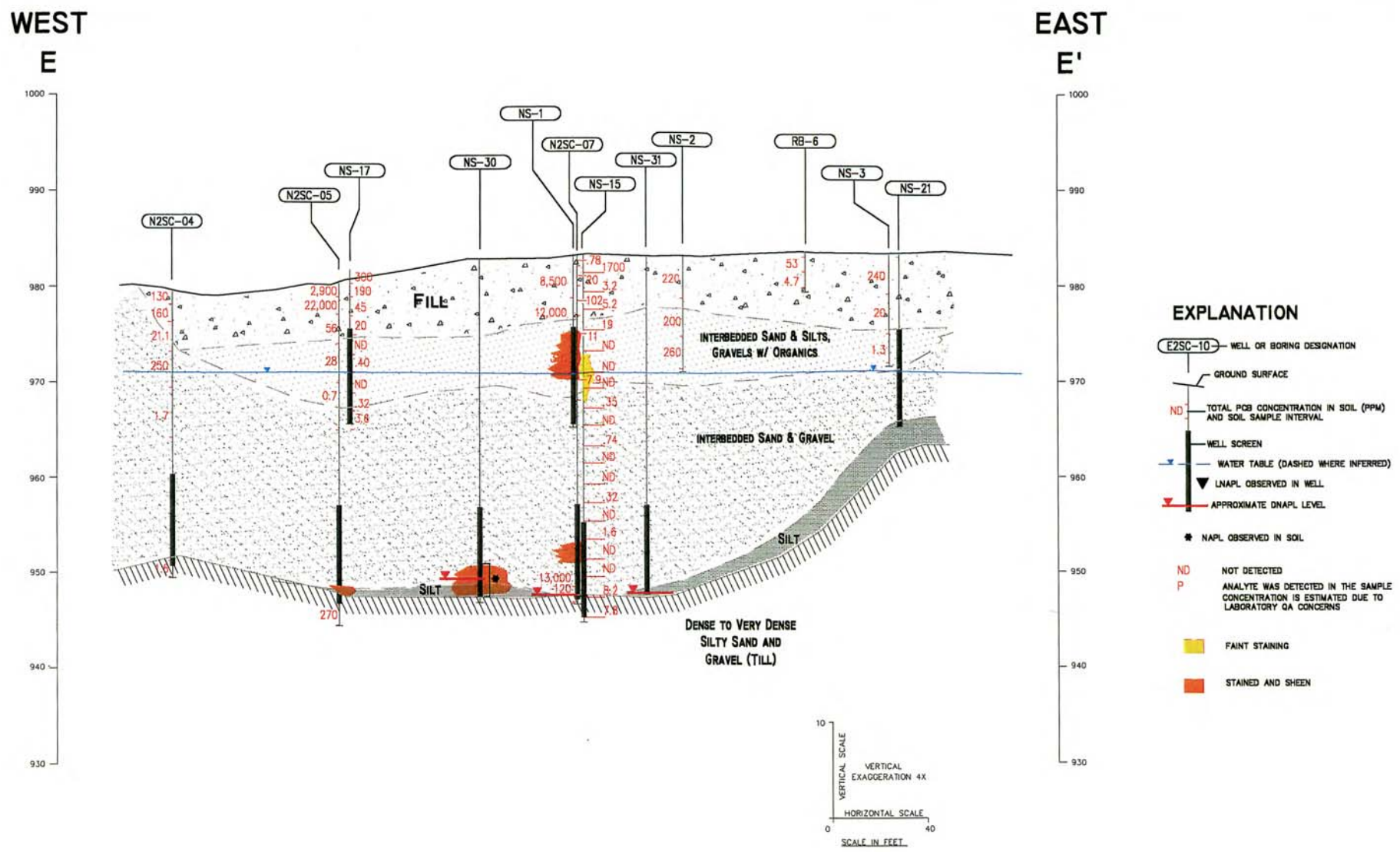


Figure 3-4 Cross-Section E-E', Newell Street Area II

HSI GEOTRANS
A TETRA TECH COMPANY
9901-e-E.dwg

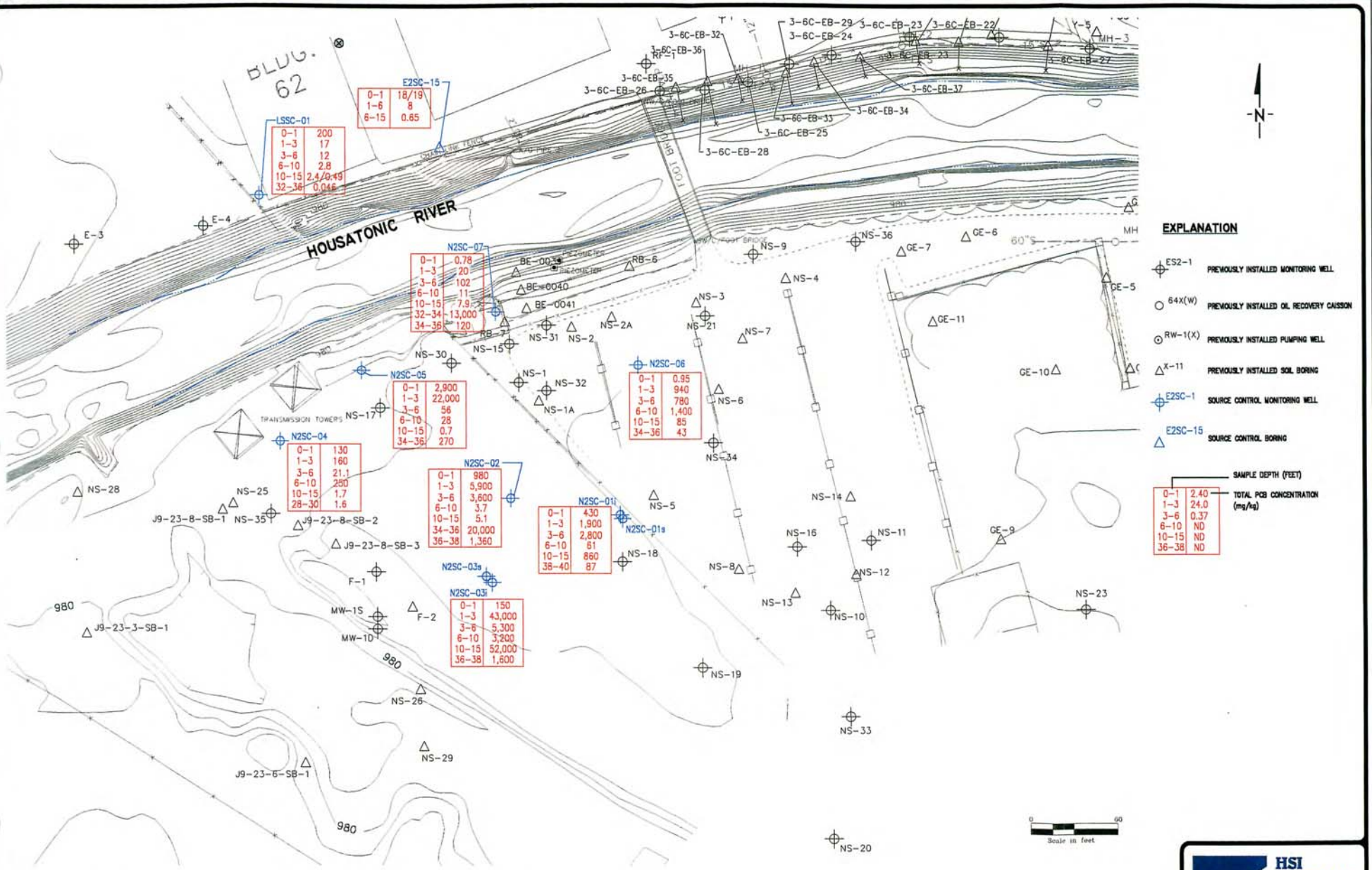


Figure 3-5 Map of Total PCB Concentrations, Newell Street Area II

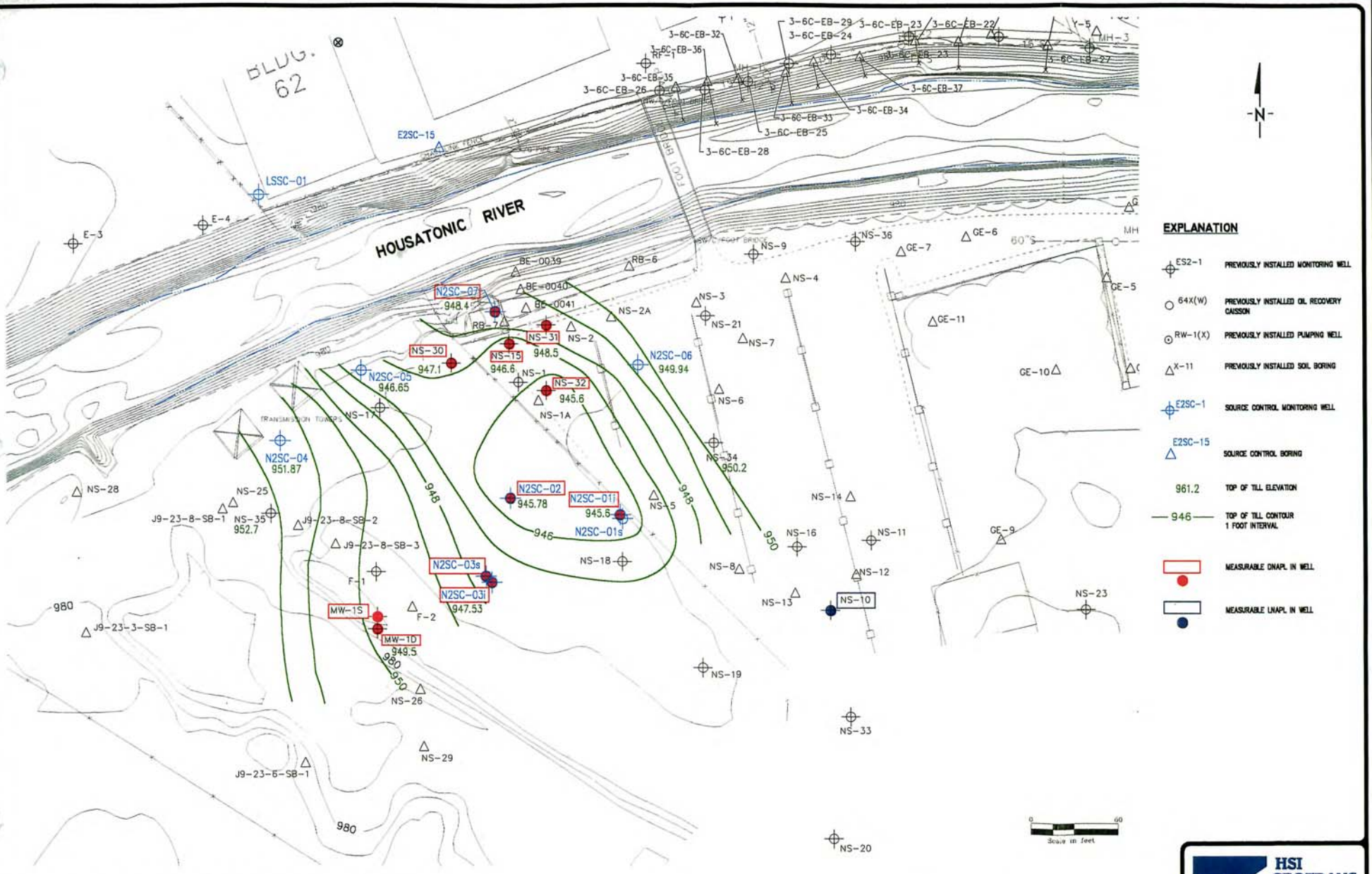


Figure 3-6 Extent of DNAPL & LNAPL , Newell Street Area II

4 LYMAN STREET SITE

Eleven borings were drilled and 9 monitoring wells were installed at the Lyman Street site between December 14, 1998 and January 5, 1999. The wells were constructed of 2-inch diameter PVC with 10-feet of well screen. A one-foot long sump was installed at the bottom of each screen. The locations of the newly installed borings and monitoring wells, and the previously installed wells and borings are shown on Figure 4-1. Boring logs and well construction diagrams of the newly installed wells are included in Appendix A. The Source Control investigations at the Lyman Street site were designed to provide additional information regarding the stratigraphy and the topography of the low permeability till underlying the site, further delineate the extent of NAPL, and provide the necessary information to design the supplemental containment barrier which is planned along the riverbank.

4.1 STRATIGRAPHY

The Lyman Street site is underlain by fill and fluvial deposits overlying a basal till. The fill ranges in thickness from 0 to 20 feet. The underlying fluvial deposits consist of thinly bedded fine to medium sand with lenses of coarse sand and sandy gravel. The fluvial deposits range in thickness from less than a foot to more than 30 feet. These fluvial deposits overly a relatively dense silt and silty sand deposit which is interpreted to be till and has a maximum thickness of at least 41 feet.

Previously drilled borings LS-14 and LS-25, located at the top of the river bank in the central portion of the site, penetrated a fine to medium sand beneath the till layer. Three deep borings, LSSC-02, LSSC-10 and LSSC-11 were drilled to evaluate the nature of the sand deposit penetrated by LS-14 and LS-25. Boring LSSC-02 was drilled adjacent to previously installed well LS-26, at the top of the river bank near the eastern edge of the parking lot. LSSC-02 was drilled to a depth of 51.5 feet. The till was encountered at a depth

of 28 feet and the bedrock surface was encountered at 50 feet. No sand deposits were penetrated beneath the top of the till . Boring LSSC-10 was drilled next to monitoring well LS-10 in the central portion of the site and approximately 250 feet from the river. LSSC-10 encountered till at a depth of 17 feet. Fine to medium sand was penetrated from 30 to 36 feet. Till was again encountered at a depth of 36 feet to the bottom of the boring at 40 feet. Boring LSSC-11 was drilled at the western edge of the site adjacent to monitoring well LS-38, near the top of the river bank. LSSC-11 was drilled to a depth of 60 feet. The till was encountered at a depth of 19 feet and was continuous to the final boring depth of 60 feet. No sand deposits were encountered beneath the top of the till.

Based on the observations in the new borings, the relatively dense till is continuous beneath the site. The sand observed below the till in borings LS-14, LS-25 and LSSC-10 is discontinuous and appears to be an isolated sand lens within the till. Figure 4-2 is an elevation contour map of the top of the till. The top of till is highest in the central portion of the site and slopes to the northeast and southwest. There appears to be a trough in the top of till surface that begins near boring LS-8 and SB-7 and slopes southwesterly towards monitoring well LS-45. Figures 4-3, 4-4 and 4-5, which are cross sections F-F^{1}, G-G^{1}, and H-H^{1}, illustrate the stratigraphy beneath the site. The isolated sand lens is shown on the cross sections G-G$^{'}$ and H-H$^{'}$. Whether this sand lens is continuous between the LS-14/ LS-25 area and LSCS-10 is not known. The presence of NAPL, staining, and sheens in the borings/wells is depicted on the cross-sections. It should be noted that soil zones which contain staining and/or sheens do not necessarily indicate the presence of NAPL.

4.2 RESULTS OF CHEMICAL ANALYSES

As described in section 2 of this report, samples of the subsurface soil were collected for PCB analysis. Samples were also submitted for Appendix IX+3 analyses. Table 4-1 lists the samples collected at the Lyman Street site and the analyses performed on each sample.

The areal distribution of PCB soil concentrations is shown on Figure 4-6. The PCB soil concentration data are shown in section view on Figures 4-3, 4-4 and 4-5. The concentrations of detected analytes are summarized in Tables 4-2 through 4-6. A DNAPL sample was collected from well LSSC-07. The results of this analysis have not yet been received from the laboratory and will be forwarded to the Agencies after they are received.

4.3 EXTENT OF NAPL

Water level and NAPL measurements have been collected approximately weekly from the new wells at the site since well development was completed. Table 4-7 summarizes these measurements. In addition, GE regularly monitored 37 other wells at the site throughout 1998 as part of ongoing monitoring activities. These data have been previously reported in monthly reports for the site and the annual Short-Term Measure Effectiveness Report (Golder Associates, 1998). Based on these combined data, the following evaluation of the extent of NAPL at the site has been made.

LNAPL was not observed in any of the new wells recently drilled. However, based on the 1998 monitoring performed for GE, the extent of LNAPL at the site is shown on Figure 4-7. It is noted that the LNAPL generally occurs within the limits of the former oxbow D. The western extent of the LNAPL is conservatively shown to include well LS-38, which only detected very small quantities of LNAPL (.01 feet) on two occasions in 1998. These were the only occasions that LNAPL was detected in this well since monitoring was initiated in late 1995. The LNAPL at the site is currently subject to ongoing remediation by three groundwater/NAPL recovery systems.

A measurable thickness of DNAPL was observed in one of the newly installed monitoring wells, LSSC-07. This monitoring well is located west of Lyman Street directly across from existing wells LS-12 and LS-34, where DNAPL has been observed previously. The presence of DNAPL appears related to a trough in the till surface. DNAPL has not been

observed in monitoring wells LS-43, LS-44 and LS-45 which are located in the trough down slope from LSSC-07. Additionally, NAPL has been observed on the measuring probe in well LSSC-06, although NAPL has not accumulated in the well. Figure 4-8 shows the extent of DNAPL based on monitoring conducted in 1998. Based on these observations, it appears that DNAPL is found in an L-shaped area which extends eastward from well LSSC-07 to well LS-31, and then southward to the vicinity of well RW-1. A high area in the till surface, illustrated by the 966 foot elevation contour located near well RW-1, appears to be a barrier to the southward movement of DNAPL. No DNAPL has been observed in the wells located between RW-1 and the river.

Table 4-1 Lyman Street Site Soil Samples Collected and Analyses Preformed

BORING	SAMPLE ID	DATE	TIME	DEPTH	ANALYSIS REQUESTED
LSSC-01	CS01	1/4/99	12:11	0-1	PCB
LSSC-01	CS0103	1/4/99	12:11	1-3	PCB
LSSC-01	CS0306	1/4/99	12:11	3-6	PCB
LSSC-01	CS0610	1/4/99	12:11	6-10	PCB & App IX + 3
LSSC-01	CS1015	1/4/99	12:11	10-15	PCB
LSSC-01	CS1015D	1/4/99	12:11	10-15	PCB
LSSC-01	CS3236	1/4/99	15:04	32-36	PCB
LSSC-01	SS05	1/4/99	11:04	6-8	App IX + 3 VOC
LSSC-02	CS01	12/21/98	12:52	0-1	PCB
LSSC-02	CS0103	12/21/98	12:52	1-3	PCB
LSSC-02	CS0306	12/21/98	12:52	3-6	PCB
LSSC-02	CS0610	12/21/98	12:52	6-10	PCB
LSSC-02	CS1015	12/21/98	12:52	10-15	PCB & App IX + 3
LSSC-02	CS2830	12/21/98	14:48	28-30	PCB
LSSC-02	SS08	12/21/98	12:33	12-14	App IX + 3 VOC
LSSC-03	SS06	12/16/98	12:24	6-8	App IX + 3 VOC
LSSC-04	CS01	12/14/98	14:20	0-1	PCB
LSSC-04	CS0803	12/14/98	14:20	1-3	PCB
LSSC-04	CS0306	12/14/98	14:20	3-6	PCB
LSSC-04	CS0610	12/14/98	14:20	6-10	PCB & App IX + 3
LSSC-04	CS1015	12/14/98	14:20	10-15	PCB
LSSC-04	CS2022	12/14/98	16:10	20-22	PCB
LSSC-06	CS01	12/15/98	12:09	0-1	PCB
LSSC-06	CS0103	12/15/98	12:09	1-3	PCB
LSSC-06	CS0306	12/15/98	12:09	3-6	PCB
LSSC-06	CS0610	12/15/98	12:09	6-10	PCB
LSSC-06	CS1015	12/15/98	12:09	10-15	PCB & App IX + 3
LSSC-06	CS1015D	12/15/98	12:09	10-15	App IX + 3 BNA, Metals, and Cyanide
LSSC-06	CS1719	12/15/98	12:35	17-19	PCB
LSSC-06	SS09	12/15/98	12:05	14-15	App IX + 3 VOC
LSSC-07	CS01	12/18/98	9:19	0-1	PCB
LSSC-07	CS0103	12/18/98	9:19	1-3	PCB
LSSC-07	CS0306	12/18/98	9:19	3-6	PCB
LSSC-07	CS0610	12/18/98	9:19	6-10	PCB
LSSC-07	CS1015	12/18/98	9:19	10-15	PCB & App IX + 3
LSSC-07	CS2426	12/18/98	11:25	24-26	PCB & App IX + 3
LSSC-07	CS2628	12/18/98	11:45	26-28	PCB
LSSC-07	SS08	12/18/98	8:40	12-14	App IX + 3 VOC
LSSC-07	SS15	12/18/98	11:25	24-26	App IX + 3 VOC
LSSC-08	CS01	12/16/98	16:07	0-1	PCB
LSSC-08	CS03	12/16/98	16:07	1-3	PCB
LSSC-08	CS0306	12/16/98	16:07	3-6	PCB
LSSC-08	CS0610	12/16/98	16:07	6-10	PCB
LSSC-08	CS1015	12/16/98	16:07	10-15	PCB & App IX + 3
LSSC-08	CS1015D	12/16/98	16:07	10-15	App IX + 3 Sulfide
LSSC-08	CS2123	12/17/98	8:59	21-23	PCB & App IX + 3
LSSC-08	CS2324	12/17/98	8:59	23-24	PCB
LSSC-08	SS15	12/17/98	8:54	23-24	App IX + 3 VOC

Table 4-1 Lyman Street Site Soil Samples Collected and Analyses Preformed (continued).

BORING	SAMPLE ID	DATE	TIME	DEPTH	ANALYSIS REQUESTED
LSSC-08	SS09	12/17/98	8:54	14-15	App IX + 3 VOC
LSSC-09	CS01	12/16/98	8:55	0-1	PCB
LSSC-09	CS0103	12/16/98	8:55	1-3	PCB
LSSC-09	CS0306	12/16/98	8:55	3-6	PCB
LSSC-09	CS0610	12/16/98	8:55	6-10	PCB
LSSC-09	CS1015	12/16/98	8:55	10-15	PCB & App IX + 3
LSSC-09	CS1015D	12/16/98	8:55	10-15	Dup PCB
LSSC-09	CS1719	12/16/98	8:55	17-19	PCB
LSSC-09	SS08	12/16/98	8:55	12-14	App IX + 3 VOC
LSSC-10	CS01	12/23/98	9:50	0-1	PCB
LSSC-10	CS0103	12/23/98	9:50	1-3	PCB
LSSC-10	CS0306	12/23/98	9:50	3-6	PCB
LSSC-10	CS0610	12/23/98	9:50	6-10	PCB
LSSC-10	CS1015	12/23/98	9:50	10-15	PCB & App IX + 3
LSSC-10	CS1920	12/23/98	10:21	19-20	PCB
LSSC-10	SS09	12/23/98	9:36	14-15	App IX + 3 VOC
LSSC-10	CS3840	12/29/98	12:55	38-40	PCB
LSSC-11	CS01	12/29/98	16:45	0-1	PCB
LSSC-11	CS0103	12/29/98	16:45	1-3	PCB
LSSC-11	CS0306	12/29/98	16:45	3-6	PCB
LSSC-11	CS0610	12/29/98	16:45	6-10	PCB
LSSC-11	CS1015	12/29/98	16:45	10-15	PCB & App IX + 3
LSSC-11	CS1517	12/29/98	16:45	15-17	PCB & App IX + 3
LSSC-11	SS08	12/29/98	15:50	12-14	App IX + 3 VOC
LSSC-11	SS10	12/29/98	16:11	15-17	App IX + 3 VOC

Table 4-2 Detected PCB Soil Concentrations, Lyman Street Site.

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Units*
LSSC-01					
	CS01	0-1			
			Aroclor 1254	200	mg/kg
			Total PCBs	**200**	mg/kg
	CS0103	1-3			
			Aroclor 1254	17	mg/kg
			Total PCBs	**17**	mg/kg
	CS0306	3-6			
			Aroclor 1254	12	mg/kg
			Total PCBs	**12**	mg/kg
	CS0610	6-10			
			Aroclor 1254	2.8	mg/kg
			Total PCBs	**2.8**	mg/kg
	CS1015	10-15			
			Aroclor 1260	1.3	mg/kg
			Aroclor 1254	1.1	mg/kg
			Total PCBs	**2.4**	mg/kg
	CS1015D	10-15			
			Aroclor 1254	0.49	mg/kg
			Total PCBs	**0.49**	mg/kg
	CS3236	32-36			
			Aroclor 1254	0.046	mg/kg
			Total PCBs	**0.046**	mg/kg
LSSC-02					
	CS01	0-1			
			Aroclor 1254	54	mg/kg
			Total PCBs	**54**	mg/kg
	CS0103	1-3			
			Aroclor 1260	0.4	mg/kg
			Aroclor 1254	0.49	mg/kg
			Total PCBs	**0.89**	mg/kg
	CS0306	3-6			
			Aroclor 1254	0.6	mg/kg
			Total PCBs	**0.6**	mg/kg
	CS0610	6-10			
			Aroclor 1242	0.23	mg/kg
			Aroclor 1260	0.44	mg/kg

Table 4-2 Detected PCB Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Units*
			Aroclor 1254	0.5	mg/kg
			Total PCBs	**1.17**	mg/kg
	CS1015	10-15			
			Aroclor 1254	0.25	mg/kg
			Total PCBs	**0.25**	mg/kg
	CS2830	28-30			
			Aroclor 1254	0.053	mg/kg
			Total PCBs	**0.053**	mg/kg
LSSC-04					
	CS01	0-1			
			Aroclor 1260	60	mg/kg
			Aroclor 1254	86	mg/kg
			Total PCBs	**146**	mg/kg
	CS0103	1-3			
			Aroclor 1254	89	mg/kg
			Aroclor 1260	53	mg/kg
			Total PCBs	**142**	mg/kg
	CS0306	3-6			
			Aroclor 1254	39	mg/kg
			Aroclor 1260	23	mg/kg
			Total PCBs	**62**	mg/kg
	CS0610	6-10			
			Aroclor 1260	3	mg/kg
			Aroclor 1254	5	mg/kg
			Total PCBs	**8**	mg/kg
	CS1015	10-15			
			Aroclor 1254	0.12	mg/kg
			Total PCBs	**0.12**	mg/kg
	CS2022	20-22			
			Aroclor 1254	25	mg/kg
			Total PCBs	**25**	mg/kg
LSSC-06					
	CS01	0-1			
			Aroclor 1254	1.4	mg/kg
			Total PCBs	**1.4**	mg/kg
	CS0103	1-3			
			Aroclor 1254	99	mg/kg

Table 4-2 Detected PCB Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Units*
			Total PCBs	**99**	mg/kg
	CS0306	3-6			
			Aroclor 1254	3600	mg/kg
			Total PCBs	**3600**	mg/kg
	CS0610	6-10			
			Aroclor 1254	2500	mg/kg
			Total PCBs	**2500**	mg/kg
	CS1015	10-15			
			Aroclor 1254	4300	mg/kg
			Total PCBs	**4300**	mg/kg
	CS1719	17-19			
			Aroclor 1254	370	mg/kg
			Total PCBs	**370**	mg/kg
LSSC-07					
	CS01	0-1			
			Aroclor 1254	0.43	mg/kg
			Aroclor 1260	0.63	mg/kg
			Total PCBs	**1.06**	mg/kg
	CS0103	1-3			
			Aroclor 1260	4.2	mg/kg
			Total PCBs	**4.2**	mg/kg
	CS0306	3-6			
			Aroclor 1260	8.7	mg/kg
			Total PCBs	**8.7**	mg/kg
	CS0610	6-10			
			Aroclor 1260	7.7	mg/kg
			Total PCBs	**7.7**	mg/kg
	CS1015	10-15			
			Aroclor 1260	0.55	mg/kg
			Aroclor 1254	0.4	mg/kg
			Total PCBs	**0.95**	mg/kg
	CS2426	24-26			
			Aroclor 1254	3100	mg/kg
			Total PCBs	**3100**	mg/kg
	CS2428	26-28			
			Aroclor 1254	110	mg/kg
			Total PCBs	**110**	mg/kg

Table 4-2 Detected PCB Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Units*
LSSC-08					
	CS0.5	0-0.5			
			Aroclor 1260	2.5	mg/kg
			Aroclor 1254	8.6	mg/kg
			Total PCBs	**11.1**	mg/kg
	CS01	0-1			
			Aroclor 1260	4.8	mg/kg
			Aroclor 1254	6.3	mg/kg
			Total PCBs	**11.1**	mg/kg
	CS03	1-3			
			Aroclor 1254	3.5	mg/kg
			Aroclor 1260	3.7	mg/kg
			Total PCBs	**7.2**	mg/kg
	CS0306	3-6			
			Aroclor 1260	1.3	mg/kg
			Aroclor 1254	1.6	mg/kg
			Total PCBs	**2.9**	mg/kg
	CS0610	6-10			
			Aroclor 1254	1.1	mg/kg
			Aroclor 1260	0.84	mg/kg
			Total PCBs	**1.94**	mg/kg
	CS1015	10-15			
			Aroclor 1254	0.38	mg/kg
			Total PCBs	**0.38**	mg/kg
	CS2123	21-23			
			Aroclor 1254	870	mg/kg
			Total PCBs	**870**	mg/kg
	CS2324	23-24			
			Aroclor 1254	90	mg/kg
			Total PCBs	**90**	mg/kg
LSSC-09					
	CS01	0-1			
			Aroclor 1254	14	mg/kg
			Total PCBs	**14**	mg/kg
	CS0103	1-3			
			Aroclor 1254	5900	mg/kg
			Total PCBs	**5900**	mg/kg

Table 4-2 Detected PCB Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Units*
	CS0306	3-6			
			Aroclor 1254	49000	mg/kg
			Total PCBs	**49000**	mg/kg
	CS0610	6-10			
			Aroclor 1254	22000	mg/kg
			Total PCBs	**22000**	mg/kg
	CS1015	10-15			
			Aroclor 1254	1800	mg/kg
			Total PCBs	**1800**	mg/kg
	CS1015D	10-15			
			Aroclor 1254	290	mg/kg
			Total PCBs	**290**	mg/kg
	CS1719	17-19			
			Aroclor 1254	220	mg/kg
			Total PCBs	**220**	mg/kg
LSSC-10					
	CS0103	1-3			
			Aroclor 1260	0.072	mg/kg
			Total PCBs	**0.072**	mg/kg
	CS0306	3-6			
			Aroclor 1260	0.038	mg/kg
			Total PCBs	**0.038**	mg/kg
LSSC-11					
	CS01	0-1			
			Aroclor 1254	1	mg/kg
			Total PCBs	**1**	mg/kg
	CS0103	1-3			
			Aroclor 1254	7.2	mg/kg
			Total PCBs	**7.2**	mg/kg
	CS0306	3-6			
			Aroclor 1254	0.5	mg/kg
			Total PCBs	**0.5**	mg/kg
	CS0610	6-10			
			Aroclor 1254	0.33	mg/kg
			Total PCBs	**0.33**	mg/kg
	CS1015	10-15			
			Aroclor 1254	0.29	mg/kg

Table 4-2 Detected PCB Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Units*
			Total PCBs	**0.29**	mg/kg
	CS1517	15-17			
			Aroclor 1254	160	mg/kg
			Total PCBs	**160**	mg/kg

Table 4-3 Detected VOC Soil Concentrations, Lyman Street Site.

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
LSSC-03						
	SS06	8-10				
			Acetone	0.0062	J	mg/kg
			Chlorobenzene	0.0018	J	mg/kg
LSSC-04						
	CS0610	6-10				
			Acetone	0.051		mg/kg
			Toluene	0.0013	J	mg/kg
LSSC-06						
	SS09	14-15				
			1,1,2-Trichloroethane	53		mg/kg
LSSC-07						
	SS08	12-14				
			Acetone	0.15		mg/kg
	SS15	24-26				
			Carbon tetrachloride	190		mg/kg
LSSC-08						
	SS09	14-15				
			Acetone	1.2		mg/kg
LSSC-09						
	SS08	12-14				
			Acetone	0.063		mg/kg
			Chlorobenzene	0.15		mg/kg
LSSC-10						
	SS09	14-15				
			Acetone	0.044		mg/kg
LSSC-11						
	SS08	12-14				
			Methylene chloride	0.0014	J	mg/kg

Qualifier

J *Result is between MDL and RL.*

Table 4-4 Detected SVOC Soil Concentrations, Lyman Street Site.

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
LSSC-01						
	CS0610	6-10				
			Aniline	1.9		mg/kg
			Benzo(a)anthracene	0.51		mg/kg
			Benzo(a)pyrene	1.6		mg/kg
			Benzo(b)fluoranthene	1.1		mg/kg
			Benzo(ghi)perylene	0.79		mg/kg
			Benzo(k)fluoranthene	0.44		mg/kg
			Chrysene	0.7		mg/kg
			Dibenz(a,h)anthracene	0.042	J	mg/kg
			Fluoranthene	0.5		mg/kg
			Indeno(1,2,3-cd)pyrene	0.66		mg/kg
			Phenanthrene	0.28	J	mg/kg
			Phenol	0.38	J	mg/kg
			Pyrene	0.86		mg/kg
LSSC-02						
	CS1015	10-15				
			bis(2-Ethylhexyl) phthalate	0.46		mg/kg
LSSC-04						
	CS0610	6-10				
			bis(2-Ethylhexyl) phthalate	0.19	J	mg/kg
LSSC-06						
	CS1015	10-15				
			1,2,4-Trichlorobenzene	150		mg/kg
	CS1015D	10-15				
			1,2,4-Trichlorobenzene	130		mg/kg
LSSC-07						
	CS1015	10-15				
			Benzo(a)pyrene	0.64		mg/kg
			Benzo(ghi)perylene	0.045	J	mg/kg
			bis(2-Ethylhexyl) phthalate	0.39	J	mg/kg
	CS2426	24-26				
			1,2,4,5-Tetrachlorobenzene	9		mg/kg
			1,2,4-Trichlorobenzene	290		mg/kg
			1,2-Dichlorobenzene	2.8	J	mg/kg
			1,4-Dichlorobenzene	3.7	J	mg/kg
LSSC-08						

Table 4-4 Detected SVOC Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
	CS1015	10-15				
			1,2,4-Trichlorobenzene	0.41	J	mg/kg
			Benzo(ghi)perylene	0.053	J	mg/kg
			bis(2-Ethylhexyl) phthalate	0.34	J	mg/kg
			bis(2-Ethylhexyl) phthalate	0.29	J	mg/kg
			Indeno(1,2,3-cd)pyrene	0.039		mg/kg
	CS1015D	10-15				
			bis(2-Ethylhexyl) phthalate	0.32	J	mg/kg
	CS2123	21-23				
			1,2,4,5-Tetrachlorobenzene	1.2		mg/kg
			2-Methylnaphthalene	0.29	J	mg/kg
			bis(2-Ethylhexyl) phthalate	0.15	J	mg/kg
			Phenanthrene	0.39	J	mg/kg
LSSC-09						
	CS1015	10-15				
			1,2,4-Trichlorobenzene	0.36	J	mg/kg
			bis(2-Ethylhexyl) phthalate	0.18	J	mg/kg
LSSC-11						
	CS1015	10-15				
			Benzo(a)anthracene	0.51		mg/kg
			Benzo(a)pyrene	0.44		mg/kg
			Benzo(b)fluoranthene	0.46		mg/kg
			Benzo(ghi)perylene	0.18	J	mg/kg
			Benzo(k)fluoranthene	0.25	J	mg/kg
			bis(2-Ethylhexyl) phthalate	0.23	J	mg/kg
			Chrysene	0.54		mg/kg
			Fluoranthene	0.93		mg/kg
			Indeno(1,2,3-cd)pyrene	0.17	J	mg/kg
			Phenanthrene	0.28	J	mg/kg
			Pyrene	1		mg/kg
	CS1517	15-17				
			1,2,4-Trichlorobenzene	1.3		mg/kg
			1,4-Dichlorobenzene	0.18	J	mg/kg
			2-Methylnaphthalene	0.35	J	mg/kg
			Acenaphthene	0.32	J	mg/kg
			Anthracene	0.23	J	mg/kg
			Benzo(a)anthracene	0.47		mg/kg

Table 4-4 Detected SVOC Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
			Benzo(a)pyrene	0.36	J	mg/kg
			Benzo(b)fluoranthene	0.48		mg/kg
			Benzo(k)fluoranthene	0.19	J	mg/kg
			bis(2-Ethylhexyl) phthalate	0.32	J	mg/kg
			Chrysene	0.58		mg/kg
			Fluoranthene	1.1		mg/kg
			Fluorene	0.28		mg/kg
			Indeno(1,2,3-cd)pyrene	0.036		mg/kg
			Phenanthrene	1.3		mg/kg
			Pyrene	1.2		mg/kg

Qualifier

J *Result is between MDL and RL.*

Table 4-5 Detected Metals Soil Concentrations, Lyman Street Site.

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
LSSC-01						
	CS0610	6-10				
			Antimony	1.6		mg/kg
			Arsenic	7.7		mg/kg
			Barium	116		mg/kg
			Beryllium	0.69		mg/kg
			Cadmium	0.45	B	mg/kg
			Chromium	28.4		mg/kg
			Cobalt	10.1		mg/kg
			Copper	85.4		mg/kg
			Lead	38.8		mg/kg
			Mercury	0.11	B	mg/kg
			Nickel	14.5		mg/kg
			Selenium	0.55	B	mg/kg
			Tin	5.9	B	mg/kg
			Vanadium	30.2		mg/kg
			Zinc	86.9		mg/kg
	CS0610 DUP	6-10				
			Antimony	1.4		mg/kg
			Arsenic	8.6		mg/kg
			Barium	49.9		mg/kg
			Beryllium	0.45		mg/kg
			Cadmium	0.48		mg/kg
			Chromium	24.3		mg/kg
			Cobalt	12.1		mg/kg
			Copper	101		mg/kg
			Lead	40.9		mg/kg
			Nickel	17.2		mg/kg
			Tin	5.2		mg/kg
			Vanadium	21.4		mg/kg
			Zinc	89.7		mg/kg
LSSC-02						
	CS1015	10-15				
			Antimony	0.89		mg/kg
			Antimony	0.77	B	mg/kg
			Arsenic	7.2		mg/kg
			Arsenic	8.1		mg/kg

Table 4-5 Detected Metals Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
			Barium	102		mg/kg
			Barium	88.5		mg/kg
			Beryllium	0.43		mg/kg
			Beryllium	0.37	B	mg/kg
			Cadmium	0.18	B	mg/kg
			Cadmium	0.21		mg/kg
			Chromium	13.1		mg/kg
			Chromium	10.8		mg/kg
			Cobalt	8.8		mg/kg
			Cobalt	8.7		mg/kg
			Copper	28.9		mg/kg
			Copper	32.5		mg/kg
			Lead	12.7		mg/kg
			Lead	15.9		mg/kg
			Nickel	14.1		mg/kg
			Nickel	14.5		mg/kg
			Vanadium	13.6		mg/kg
			Vanadium	16.9		mg/kg
			Zinc	34.4		mg/kg
			Zinc	28.7		mg/kg
LSSC-04						
	CS0610	6-10				
			Antimony	1.5		mg/kg
			Arsenic	10.1		mg/kg
			Barium	56.3		mg/kg
			Beryllium	0.52	B	mg/kg
			Cadmium	0.66		mg/kg
			Chromium	20		mg/kg
			Cobalt	9		mg/kg
			Copper	64.4		mg/kg
			Lead	48.8		mg/kg
			Mercury	0.038	B	mg/kg
			Nickel	17.3		mg/kg
			Thallium	0.62	B	mg/kg
			Vanadium	24.3		mg/kg
			Zinc	43.2		mg/kg
LSSC-06						
	CS1015	10-15				

Table 4-5 Detected Metals Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
			Arsenic	2.3		mg/kg
			Barium	40		mg/kg
			Beryllium	0.28	B	mg/kg
			Cadmium	0.085	B	mg/kg
			Chromium	8.4		mg/kg
			Cobalt	6.9		mg/kg
			Copper	30.9		mg/kg
			Lead	12.3		mg/kg
			Nickel	11.7		mg/kg
			Selenium	0.39	B	mg/kg
			Tin	3.2	B	mg/kg
			Vanadium	8.1		mg/kg
			Zinc	50.1		mg/kg
	CS1015 DUP	10-15				
			Mercury	0.015		mg/kg
	CS1015D	10-15				
			Antimony	0.2	B	mg/kg
			Arsenic	2.6		mg/kg
			Barium	32		mg/kg
			Beryllium	0.25	B	mg/kg
			Cadmium	0.092	B	mg/kg
			Chromium	8.3		mg/kg
			Cobalt	6.9		mg/kg
			Copper	31.3		mg/kg
			Lead	11.7		mg/kg
			Mercury	0.041	B	mg/kg
			Nickel	12.1		mg/kg
			Selenium	0.35	B	mg/kg
			Vanadium	7		mg/kg
			Zinc	47.6		mg/kg
LSSC-07						
	CS1015	10-15				
			Antimony	0.42	B	mg/kg
			Arsenic	2.1		mg/kg
			Barium	29.4		mg/kg
			Beryllium	0.26	B	mg/kg
			Cadmium	0.13	B	mg/kg

Table 4-5 Detected Metals Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
			Chromium	8.1		mg/kg
			Cobalt	7.6		mg/kg
			Copper	9.8		mg/kg
			Lead	6.7		mg/kg
			Nickel	11.7		mg/kg
			Vanadium	8.4		mg/kg
			Zinc	43.2		mg/kg
	CS2426	24-26				
			Antimony	0.24	B	mg/kg
			Arsenic	8.3		mg/kg
			Barium	12.8	B	mg/kg
			Beryllium	0.11	B	mg/kg
			Cadmium	0.38	B	mg/kg
			Chromium	9		mg/kg
			Cobalt	12.9		mg/kg
			Copper	35.4		mg/kg
			Lead	11.6		mg/kg
			Mercury	0.026	B	mg/kg
			Nickel	16.9		mg/kg
			Vanadium	6		mg/kg
			Zinc	49		mg/kg
LSSC-08						
	CS1015	10-15				
			Antimony	0.28	B	mg/kg
			Arsenic	8.6		mg/kg
			Arsenic	2.1		mg/kg
			Barium	85.3		mg/kg
			Barium	25.9	B	mg/kg
			Beryllium	0.61	B	mg/kg
			Beryllium	0.26	B	mg/kg
			Cadmium	0.34	B	mg/kg
			Cadmium	0.1	B	mg/kg
			Chromium	13.8		mg/kg
			Chromium	7.9		mg/kg
			Cobalt	8.6		mg/kg
			Cobalt	5.6	B	mg/kg
			Copper	9.8		mg/kg

Table 4-5 Detected Metals Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
			Copper	18.3		mg/kg
			Lead	13.6		mg/kg
			Lead	7.1		mg/kg
			Nickel	19.6		mg/kg
			Nickel	11.7		mg/kg
			Selenium	0.43	B	mg/kg
			Thallium	0.71	B	mg/kg
			Vanadium	7.7		mg/kg
			Vanadium	23.3		mg/kg
			Zinc	40.4		mg/kg
			Zinc	47.9		mg/kg
	CS1015D	10-15				
			Antimony	0.17	B	mg/kg
			Arsenic	2.2		mg/kg
			Barium	32.4		mg/kg
			Beryllium	0.32	B	mg/kg
			Cadmium	0.19	B	mg/kg
			Chromium	9.8		mg/kg
			Cobalt	8.7		mg/kg
			Copper	11.7		mg/kg
			Lead	8.8		mg/kg
			Mercury	0.016	B	mg/kg
			Nickel	14.4		mg/kg
			Selenium	0.43	B	mg/kg
			Thallium	0.79	B	mg/kg
			Tin	3.6	B	mg/kg
			Vanadium	9.9		mg/kg
			Zinc	51.4		mg/kg
	CS2123	21-23				
			Antimony	0.27	B	mg/kg
			Arsenic	6.1		mg/kg
			Barium	23.6	B	mg/kg
			Beryllium	0.24	B	mg/kg
			Cadmium	0.23	B	mg/kg
			Chromium	17.4		mg/kg
			Cobalt	12.2		mg/kg
			Copper	25.6		mg/kg

Table 4-5 Detected Metals Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
			Lead	9.7		mg/kg
			Nickel	21.9		mg/kg
			Vanadium	8.1		mg/kg
			Zinc	62.5		mg/kg
LSSC-09						
	CS1015	10-15				
			Antimony	0.23	B	mg/kg
			Arsenic	2.1		mg/kg
			Barium	40.5		mg/kg
			Beryllium	0.34	B	mg/kg
			Cadmium	0.17	B	mg/kg
			Chromium	9.6		mg/kg
			Cobalt	8.8		mg/kg
			Copper	28.4		mg/kg
			Lead	10.6		mg/kg
			Mercury	0.017	B	mg/kg
			Nickel	13.2		mg/kg
			Selenium	0.4	B	mg/kg
			Vanadium	10.3		mg/kg
			Zinc	59.9		mg/kg
LSSC-10						
	CS1015	10-15				
			Antimony	0.22	B	mg/kg
			Arsenic	6.7		mg/kg
			Barium	12	B	mg/kg
			Beryllium	0.15	B	mg/kg
			Cadmium	0.29	B	mg/kg
			Chromium	12.3		mg/kg
			Cobalt	19.7		mg/kg
			Copper	36.6		mg/kg
			Lead	11.9		mg/kg
			Nickel	28.7		mg/kg
			Vanadium	8.7		mg/kg
			Zinc	81.6		mg/kg
LSSC-11						
	CS1015	10-15				
			Antimony	0.29	B	mg/kg
			Arsenic	2.4		mg/kg

Table 4-5 Detected Metals Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth (feet)*	*Compound*	*Result*	*Qualifier*	*Units*
			Barium	34.6		mg/kg
			Beryllium	0.3	B	mg/kg
			Cadmium	0.23	B	mg/kg
			Chromium	10.9		mg/kg
			Cobalt	8.4		mg/kg
			Copper	12.3		mg/kg
			Lead	12.6		mg/kg
			Mercury	0.077	B	mg/kg
			Nickel	11.6		mg/kg
			Vanadium	10.2		mg/kg
			Zinc	52.1		mg/kg
	CS1517	15-17				
			Arsenic	0.94	B	mg/kg
			Barium	9.6	B	mg/kg
			Beryllium	0.084	B	mg/kg
			Cadmium	0.048	B	mg/kg
			Chromium	6.1		mg/kg
			Cobalt	3.9	B	mg/kg
			Copper	3.9		mg/kg
			Lead	2.8		mg/kg
			Nickel	6		mg/kg
			Vanadium	3.5	B	mg/kg
			Zinc	22.6		mg/kg

Qualifier

B Result is between MDL and RL

Table 4-6 Detected Dioxin and Furan Soil Concentrations, Lyman Street Site.

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Qualifier*	*Units*
LSSC-01	CS0610	6-10				
			1,2,3,4,6,7,8-HpCDF	0.00001		ug/kg
			1,2,3,4,7,8-HxCDF	0.0000096		ug/kg
			1,2,3,6,7,8-HxCDF	0.0000046	j	ug/kg
			1,2,3,7,8-PeCDF	0.0000032	j	ug/kg
			2,3,4,7,8-PeCDF	0.0000034	j	ug/kg
			2,3,7,8-TCDF	0.0000083	g	ug/kg
			HpCDDs (total)	0.0000061		ug/kg
			HpCDFs (total)	0.000019		ug/kg
			HxCDFs (total)	0.000048		ug/kg
			OCDD	0.000042		ug/kg
			OCDF	0.0000076	j	ug/kg
			PeCDFs (total)	0.00004		ug/kg
			TCDFs (total)	0.000055		ug/kg
LSSC-02	CS1015	10-15				
			TCDDs (total)	0.000005		ug/kg
LSSC-04	CS0610	6-10				
			1,2,3,4,6,7,8-HpCDD	0.0000048	j	ug/kg
			1,2,3,4,6,7,8-HpCDF	0.00002		ug/kg
			1,2,3,4,7,8,9-HpCDF	0.0000042	j	ug/kg
			1,2,3,4,7,8-HxCDF	0.000015		ug/kg
			1,2,3,6,7,8-HxCDF	0.000015		ug/kg
			1,2,3,7,8-PeCDF	0.000015		ug/kg
			2,3,4,6,7,8-HxCDF	0.0000071		ug/kg
			2,3,4,7,8-PeCDF	0.0000085		ug/kg
			2,3,7,8-TCDF	0.000023	g	ug/kg
			HpCDDs (total)	0.000011		ug/kg
			HpCDFs (total)	0.000055		ug/kg
			HxCDDs (total)	0.000014		ug/kg
			HxCDFs (total)	0.00014		ug/kg
			OCDD	0.000051		ug/kg
			OCDF	0.000014		ug/kg
			PeCDFs (total)	0.00016		ug/kg
			TCDDs (total)	0.000014		ug/kg
			TCDFs (total)	0.00016		ug/kg
LSSC-06	CS1015	10-15				
			1,2,3,4,6,7,8-HpCDD	0.00038		ug/kg
			1,2,3,4,6,7,8-HpCDF	0.0024		ug/kg
			1,2,3,4,7,8,9-HpCDF	0.0027		ug/kg

Table 4-6 Detected Dioxin and Furan Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Qualifier*	*Units*
			1,2,3,4,7,8-HxCDD	0.000041		ug/kg
			1,2,3,4,7,8-HxCDF	0.0065	E	ug/kg
			1,2,3,6,7,8-HxCDD	0.000076		ug/kg
			1,2,3,6,7,8-HxCDF	0.0029	E	ug/kg
			1,2,3,7,8,9-HxCDD	0.000043		ug/kg
			1,2,3,7,8,9-HxCDF	0.000096		ug/kg
			1,2,3,7,8-PeCDD	0.000035		ug/kg
			1,2,3,7,8-PeCDF	0.00036		ug/kg
			2,3,4,6,7,8-HxCDF	0.00033		ug/kg
			2,3,4,7,8-PeCDF	0.0016		ug/kg
			2,3,7,8-TCDF	0.00016	g	ug/kg
			HpCDDs (total)	0.00089		ug/kg
			HpCDFs (total)	0.0078		ug/kg
			HxCDDs (total)	0.0013		ug/kg
			HxCDFs (total)	0.017		ug/kg
			OCDD	0.0021		ug/kg
			OCDF	0.0027		ug/kg
			PeCDDs (total)	0.00048		ug/kg
			PeCDFs (total)	0.012		ug/kg
			TCDDs (total)	0.00053		ug/kg
			TCDFs (total)	0.004		ug/kg
LSSC-07	CS1015	10-15				
			1,2,3,4,6,7,8-HpCDF	0.0000058	j	ug/kg
			1,2,3,4,7,8-HxCDF	0.0000039	j	ug/kg
			2,3,7,8-TCDF	0.0000014	g	ug/kg
			HpCDFs (total)	0.000015		ug/kg
			HxCDFs (total)	0.000033		ug/kg
			OCDD	0.000011	j	ug/kg
			PeCDFs (total)	0.000015		ug/kg
			TCDFs (total)	0.000022		ug/kg
			1,2,3,4,6,7,8-HpCDD	0.0053	E	ug/kg
			1,2,3,4,6,7,8-HpCDF	0.007	E	ug/kg
			1,2,3,4,7,8,9-HpCDF	0.0065	E	ug/kg
			1,2,3,4,7,8-HxCDD	0.00039		ug/kg
			1,2,3,4,7,8-HxCDF	0.012	E	ug/kg
			1,2,3,6,7,8-HxCDD	0.00021		ug/kg
			1,2,3,6,7,8-HxCDF	0.0047	E	ug/kg
			1,2,3,7,8,9-HxCDD	0.00024		ug/kg
			1,2,3,7,8,9-HxCDF	0.00016		ug/kg

Table 4-6 Detected Dioxin and Furan Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Qualifier*	*Units*
			1,2,3,7,8-PeCDD	0.00013		ug/kg
			1,2,3,7,8-PeCDF	0.00059		ug/kg
			2,3,4,6,7,8-HxCDF	0.0008		ug/kg
			2,3,4,7,8-PeCDF	0.0021		ug/kg
			2,3,7,8-TCDD	0.000026		ug/kg
			2,3,7,8-TCDF	0.00017	gF	ug/kg
			HpCDDs (total)	0.0086		ug/kg
			HpCDFs (total)	0.024		ug/kg
			HxCDDs (total)	0.0025		ug/kg
			HxCDFs (total)	0.034		ug/kg
			OCDD	0.04	E	ug/kg
			OCDF	0.017	E	ug/kg
			PeCDDs (total)	0.00022		ug/kg
			PeCDFs (total)	0.018		ug/kg
			TCDDs (total)	0.0013		ug/kg
			TCDFs (total)	0.0062		ug/kg
LSSC-08	CS1015	10-15				
			2,3,7,8-TCDF	9.4E-07	gj	ug/kg
			OCDD	0.000011	j	ug/kg
			TCDFs (total)	0.0000086		ug/kg
			1,2,3,4,6,7,8-HpCDD	0.00023		ug/kg
			1,2,3,4,6,7,8-HpCDF	0.00044		ug/kg
			1,2,3,4,7,8,9-HpCDF	0.00043		ug/kg
			1,2,3,4,7,8-HxCDD	0.000016		ug/kg
			1,2,3,4,7,8-HxCDF	0.0011		ug/kg
			1,2,3,6,7,8-HxCDD	0.000019		ug/kg
			1,2,3,6,7,8-HxCDF	0.0005		ug/kg
			1,2,3,7,8,9-HxCDD	0.000016		ug/kg
			1,2,3,7,8,9-HxCDF	0.000013		ug/kg
			1,2,3,7,8-PeCDF	0.000058		ug/kg
			2,3,4,6,7,8-HxCDF	0.000079		ug/kg
			2,3,4,7,8-PeCDF	0.00022		ug/kg
			2,3,7,8-TCDF	0.000025	g	ug/kg
			HpCDDs (total)	0.00039		ug/kg
			HpCDFs (total)	0.0015		ug/kg
			HxCDDs (total)	0.0002		ug/kg
			HxCDFs (total)	0.003		ug/kg
			OCDD	0.0018		ug/kg
			OCDF	0.001		ug/kg

Table 4-6 Detected Dioxin and Furan Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Qualifier*	*Units*
			PeCDFs (total)	0.0017		ug/kg
			TCDDs (total)	0.00015		ug/kg
			TCDFs (total)	0.0009		ug/kg
LSSC-09	CS1015	10-15				
			1,2,3,4,6,7,8-HpCDD	0.000012		ug/kg
			1,2,3,4,6,7,8-HpCDF	0.000045		ug/kg
			1,2,3,4,7,8,9-HpCDF	0.00035		ug/kg
			1,2,3,4,7,8-HxCDF	0.0012		ug/kg
			1,2,3,6,7,8-HxCDF	0.00066		ug/kg
			1,2,3,7,8,9-HxCDD	0.0000039	j	ug/kg
			1,2,3,7,8,9-HxCDF	0.000014		ug/kg
			1,2,3,7,8-PeCDF	0.00012		ug/kg
			2,3,4,6,7,8-HxCDF	0.00013		ug/kg
			2,3,4,7,8-PeCDF	0.0003		ug/kg
			2,3,7,8-TCDF	0.000064	g	ug/kg
			HpCDDs (total)	0.00002		ug/kg
			HpCDFs (total)	0.0012		ug/kg
			HxCDDs (total)	0.000023		ug/kg
			HxCDFs (total)	0.0038		ug/kg
			OCDD	0.000023		ug/kg
			OCDF	0.00054		ug/kg
			PeCDFs (total)	0.0026		ug/kg
			TCDDs (total)	0.0000039		ug/kg
			TCDFs (total)	0.00091		ug/kg
			1,2,3,4,6,7,8-HpCDD	0.0000068	j	ug/kg
			1,2,3,4,6,7,8-HpCDF	0.00018		ug/kg
			1,2,3,4,7,8,9-HpCDF	0.00012		ug/kg
			1,2,3,4,7,8-HxCDF	0.00043		ug/kg
			1,2,3,6,7,8-HxCDF	0.00028		ug/kg
			1,2,3,7,8,9-HxCDF	0.0000052	j	ug/kg
			1,2,3,7,8-PeCDF	0.00005		ug/kg
			2,3,4,6,7,8-HxCDF	0.000056		ug/kg
			2,3,4,7,8-PeCDF	0.0001		ug/kg
			2,3,7,8-TCDF	0.000033	g	ug/kg
			HpCDDs (total)	0.000015		ug/kg
			HpCDFs (total)	0.00048		ug/kg
			HxCDDs (total)	0.000011		ug/kg
			HxCDFs (total)	0.0014		ug/kg
			OCDD	0.000019		ug/kg

Table 4-6 Detected Dioxin and Furan Soil Concentrations, Lyman Street Site (continued).

Location	*Sample Name*	*Sample Depth*	*Compound*	*Result*	*Qualifier*	*Units*
			OCDF	0.00024		ug/kg
			PeCDFs (total)	0.00099		ug/kg
			TCDDs (total)	0.00001		ug/kg
			TCDFs (total)	0.00046		ug/kg
LSSC-11	CS1015	10-15				
			2,3,7,8-TCDF	0.0000016	g	ug/kg
			HxCDFs (total)	0.00001		ug/kg
			OCDD	0.0000085		ug/kg
			PeCDFs (total)	0.0000093		ug/kg
			TCDFs (total)	0.000013		ug/kg
			1,2,3,4,6,7,8-HpCDD	0.000015		ug/kg
			1,2,3,4,6,7,8-HpCDF	0.00018		ug/kg
			1,2,3,4,7,8,9-HpCDF	0.00016		ug/kg
			1,2,3,4,7,8-HxCDF	0.00036		ug/kg
			1,2,3,6,7,8-HxCDD	0.0000039		ug/kg
			1,2,3,6,7,8-HxCDF	0.00017		ug/kg
			1,2,3,7,8,9-HxCDD	0.0000038		ug/kg
			1,2,3,7,8,9-HxCDF	0.0000057		ug/kg
			1,2,3,7,8-PeCDF	0.000037		ug/kg
			2,3,4,6,7,8-HxCDF	0.00003		ug/kg
			2,3,4,7,8-PeCDF	0.00008		ug/kg
			2,3,7,8-TCDF	0.000023	g	ug/kg
			HpCDDs (total)	0.000034		ug/kg
			HpCDFs (total)	0.00058		ug/kg
			HxCDDs (total)	0.000039		ug/kg
			HxCDFs (total)	0.0011		ug/kg
			OCDD	0.000071		ug/kg
			OCDF	0.00048		ug/kg
			PeCDFs (total)	0.00091		ug/kg
			TCDDs (total)	0.000035		ug/kg
			TCDFs (total)	0.00043		ug/kg

Qualifier

- j *Result is an estimated value that is below the lower calibration limit but above the target detection level.*
- *g 2, 3, 7, 8, -TCDF results have been confirmed on a DB-225 column.*
- *E Result exceeds calibration range.*
- *F Reported value estimated due to an interference.*

Table 4-7 Summary of Water Level and NAPL Measurements, Lyman Street Site.

Boring	*Date Measured*	*Measuring Point Elevation*	*Depth to LNAPL*	*Depth to Water*	*Groundwater Elevation*	*LNAPL Thickness*	*Depth to DNAPL*	*DNAPL Elevation*	*Notes*
LSSC-01									
	1/7/99	986.95		15.81	971.14				
	1/22/99	986.95		14.80	972.15				
	1/29/99	986.95		14.69	972.26				
	2/5/99	986.95		14.17	972.78				
LSSC-03									
	12/21/98	988.96		17.23	971.73				
	12/28/98	988.96		17.16	971.80				
	1/7/99	988.96		17.25	971.71				
	1/22/99	988.96		16.45	972.51				
	1/29/99	988.96		16.22	972.74				
	2/5/99	988.96		15.82	973.14				
LSSC-04									
	12/17/98	988.9		17.21	971.69				
	12/21/98	988.9		17.21	971.69				
	12/28/98	988.9		17.15	971.75				
	1/7/99	988.9		17.22	971.68				
	1/22/99	988.9		16.42	972.48				
	1/29/99	988.9		16.20	972.70				
	2/5/99	988.9		15.80	973.10				
LSSC-05									
	12/17/98	984.87		13.61	971.26				Trace NAPL on probe
	12/21/98	984.87		13.60	971.27				Sheen on probe
	12/28/98	984.87		13.55	971.32				
	1/7/99	984.87		13.62	971.25				
	1/22/99	984.87		12.79	972.08				
	1/29/99	984.87		12.62	972.25				

Table 4-7 Summary of Water Level and NAPL Measurements, Lyman Street Site (continued).

Boring	*Date Measured*	*Measuring Point Elevation*	*Depth to LNAPL*	*Depth to Water*	*Groundwater Elevation*	*LNAPL Thickness*	*Depth to DNAPL*	*DNAPL Elevation*	*Notes*
	2/5/99	984.87		12.22	972.65				
LSSC-06									
	12/17/98	985.04		13.82	971.22				
	12/21/98	985.04		13.00	972.04				
	12/28/98	985.04		13.75	971.29				
	1/7/99	985.04		13.82	971.22				
	1/22/99	985.04		13.98	971.06				NAPL on probe
	1/29/99	985.04		12.83	972.21				
	2/5/99	985.04		12.43	972.61				1.5' DNAPL on probe
LSSC-07									
	1/7/99	982.61		11.07	971.54		23.36	959.25	
	1/22/99	982.61		10.31	972.30				2' NAPL on probe
	1/29/99	982.61		10.13	972.48		23.22	959.39	
	2/5/99	982.61		9.74	972.87		22.98	959.63	
LSSC-08									
	12/21/98	983.26		12.41	970.85				
	12/28/98	983.26		12.40	970.86				
	1/7/99	983.26		12.41	970.85				
	1/22/99	983.26		11.46	971.80				
	1/29/99	983.26		11.43	971.83				
	2/5/99	983.26		10.96	972.30				
LSSC-09									
	12/17/98	985.19		14.16	971.03				
	12/21/98	985.19		14.20	970.99				Silty tbottom
	12/28/98	985.19		14.11	971.08				
	1/7/99	985.19		14.22	970.97				
	1/22/99	985.19		13.58	971.61				

Table 4-7 Summary of Water Level and NAPL Measurements, Lyman Street Site (continued).

Boring	*Date Measured*	*Measuring Point Elevation*	*Depth to LNAPL*	*Depth to Water*	*Groundwater Elevation*	*LNAPL Thickness*	*Depth to DNAPL*	*DNAPL Elevation*	*Notes*
	1/29/99	985.19		13.33	971.86				
	2/5/99	985.19		13.08	972.11				
LSSC-10									
	1/7/99	987.18		9.73	977.45				
	1/22/99	987.18		9.26	977.92				
	1/29/99	987.18		8.57	978.61				
	2/5/99	987.18		8.26	978.92				

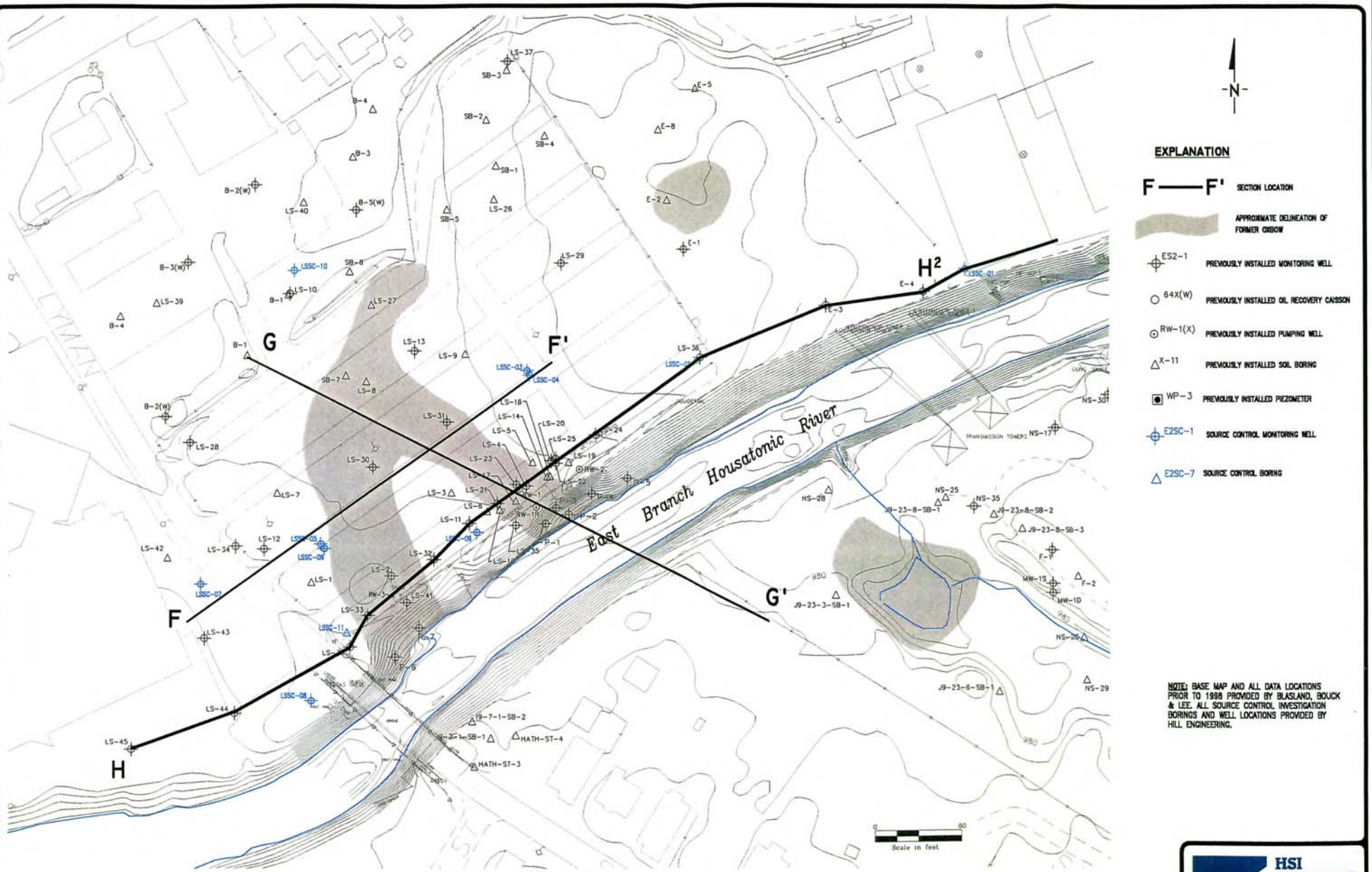


Figure 4-1 Lyman Street Site Well and Boring Location Map

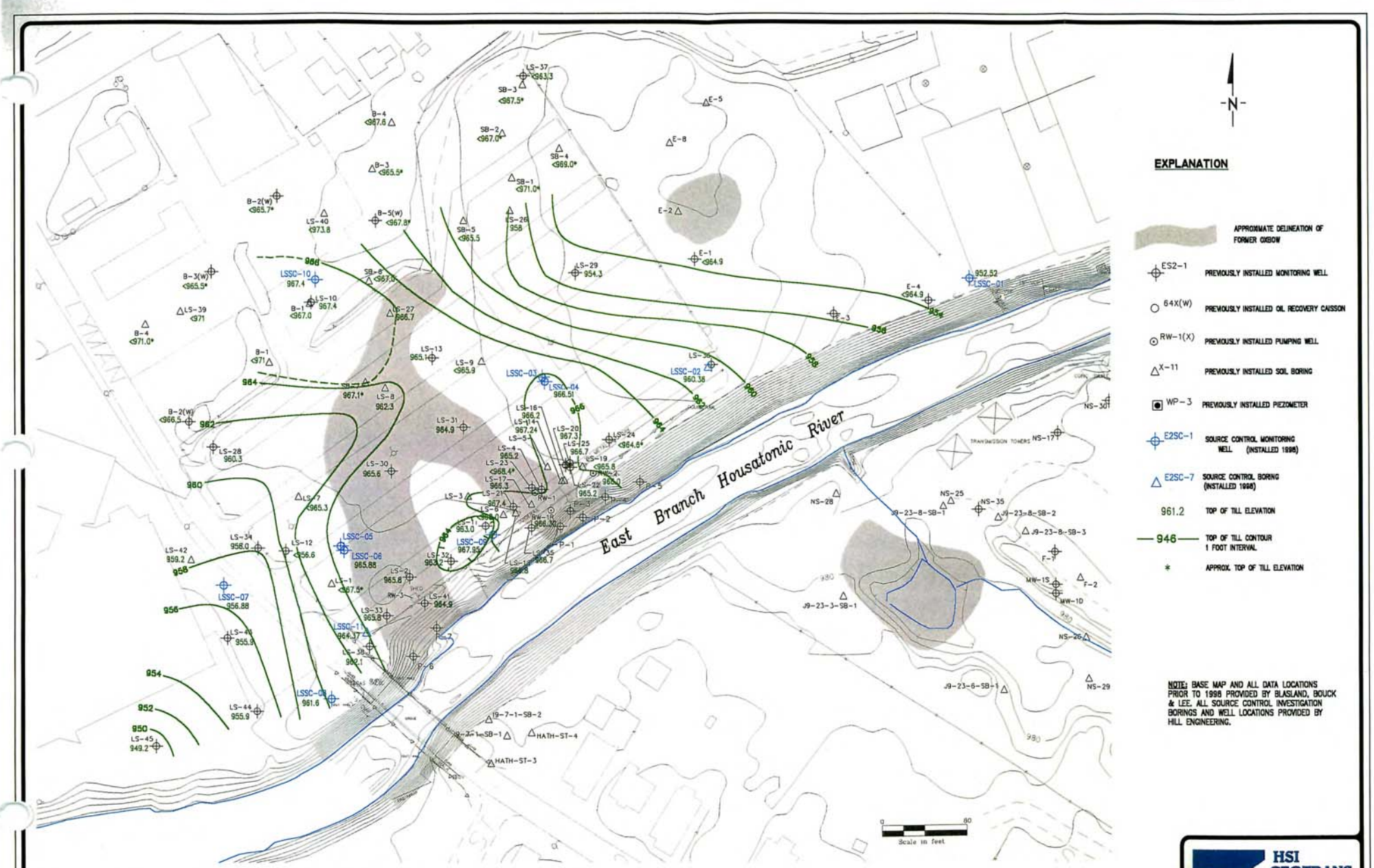


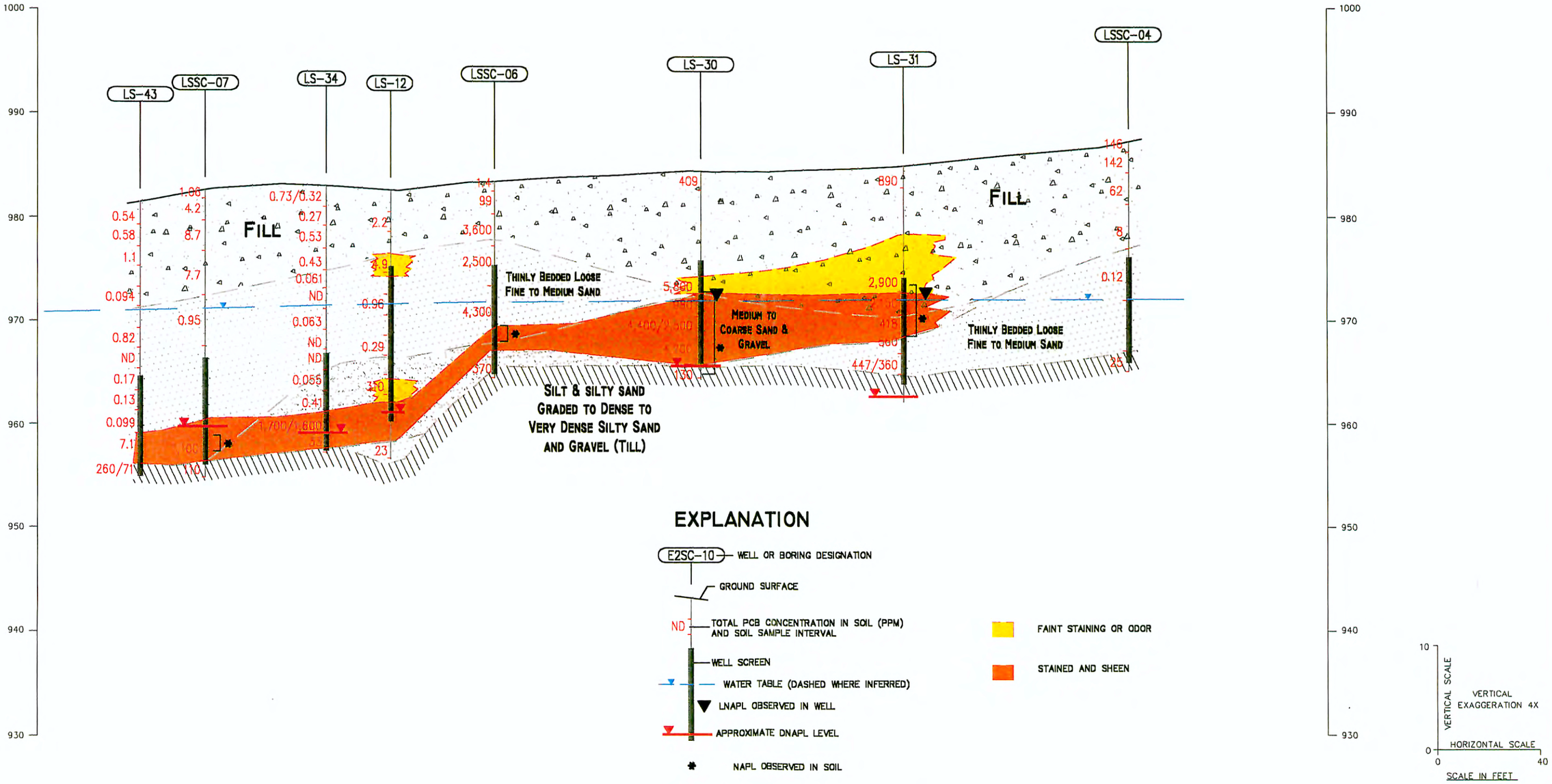
Figure 4-2 Detailed Top of Till Elevation Contour Map, Lyman Street Site

SOUTHWEST

F

NORTHEAST

F



EXPLANATION

- E2SC-10 — WELL OR BORING DESIGNATION
- GROUND SURFACE
- ND — TOTAL PCB CONCENTRATION IN SOIL (PPM) AND SOIL SAMPLE INTERVAL
- WELL SCREEN
- WATER TABLE (DASHED WHERE INFERRED)
- LNAPL OBSERVED IN WELL
- APPROXIMATE DNAPL LEVEL
- NAPL OBSERVED IN SOIL
- ND — NOT DETECTED
- P — ANALYTE WAS DETECTED IN THE SAMPLE CONCENTRATION IS ESTIMATED DUE TO LABORATORY QA CONCERNS
- FAINT STAINING OR ODOR
- STAINED AND SHEEN

VERTICAL EXAGGERATION 4X

VERTICAL SCALE 10

HORIZONTAL SCALE 0 40

SCALE IN FEET

NOTE: BASE MAP AND ALL DATA LOCATIONS PRIOR TO 1998 PROVIDED BY BLASLAND, BOUCK & LEE. ALL SOURCE CONTROL INVESTIGATION BORINGS AND WELL LOCATIONS PROVIDED BY HILL ENGINEERING.

HSI GEOTRANS
A TETRA TECH COMPANY

9812-s-F.dwg

Figure 4-3 Cross-Section F-F', Lyman Street Site

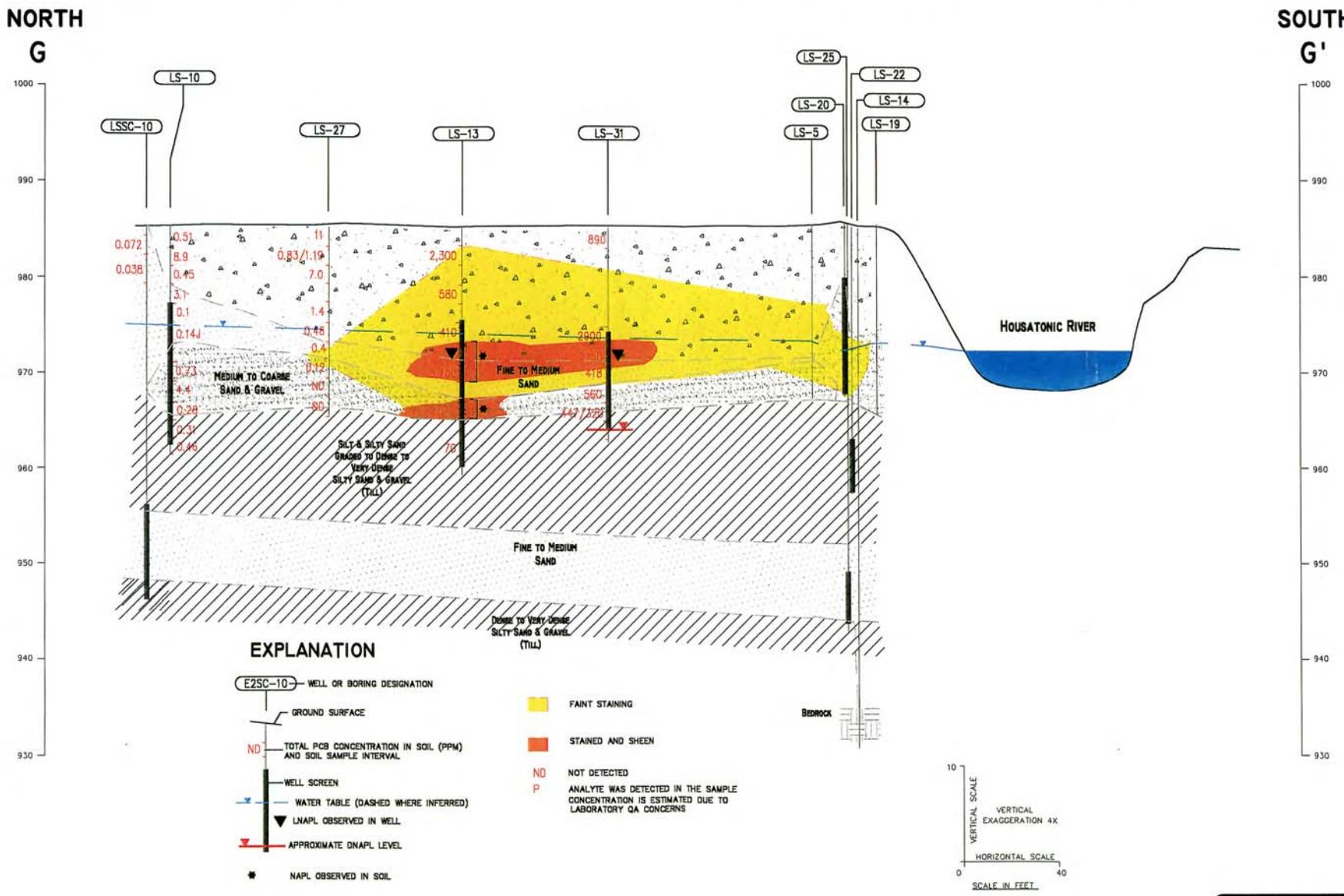


Figure 4-4 Cross-Section G-G', Lyman Street Site

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9901-s-G.dwg

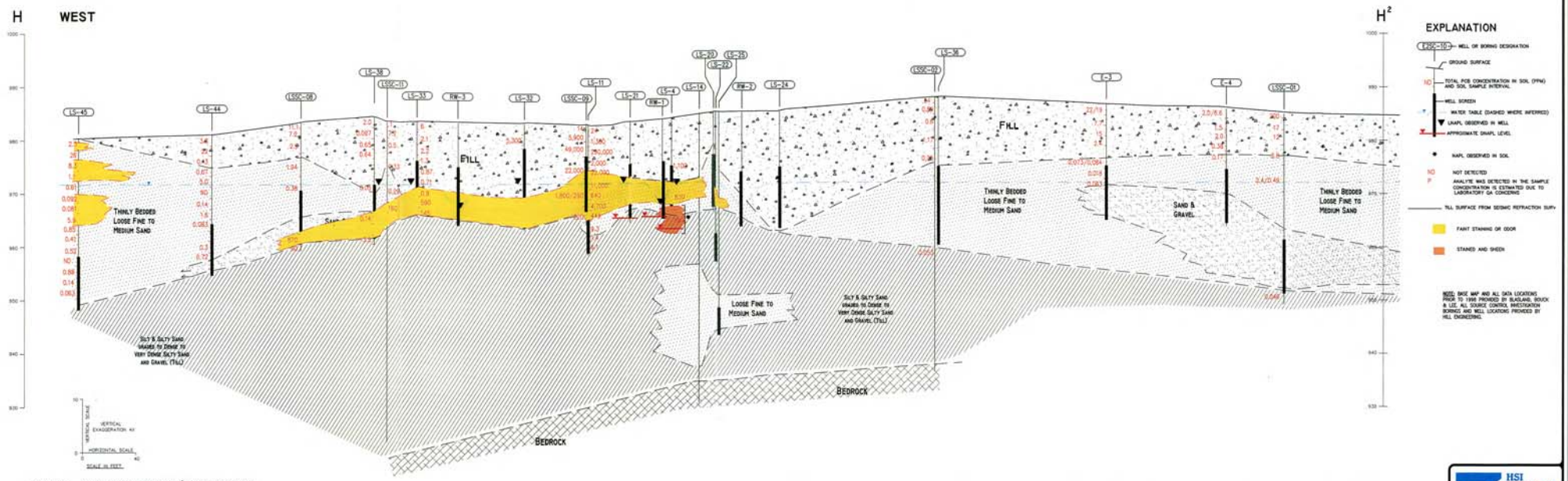


Figure 4-5 Partial Cross-Section H-H', Lyman Street Site

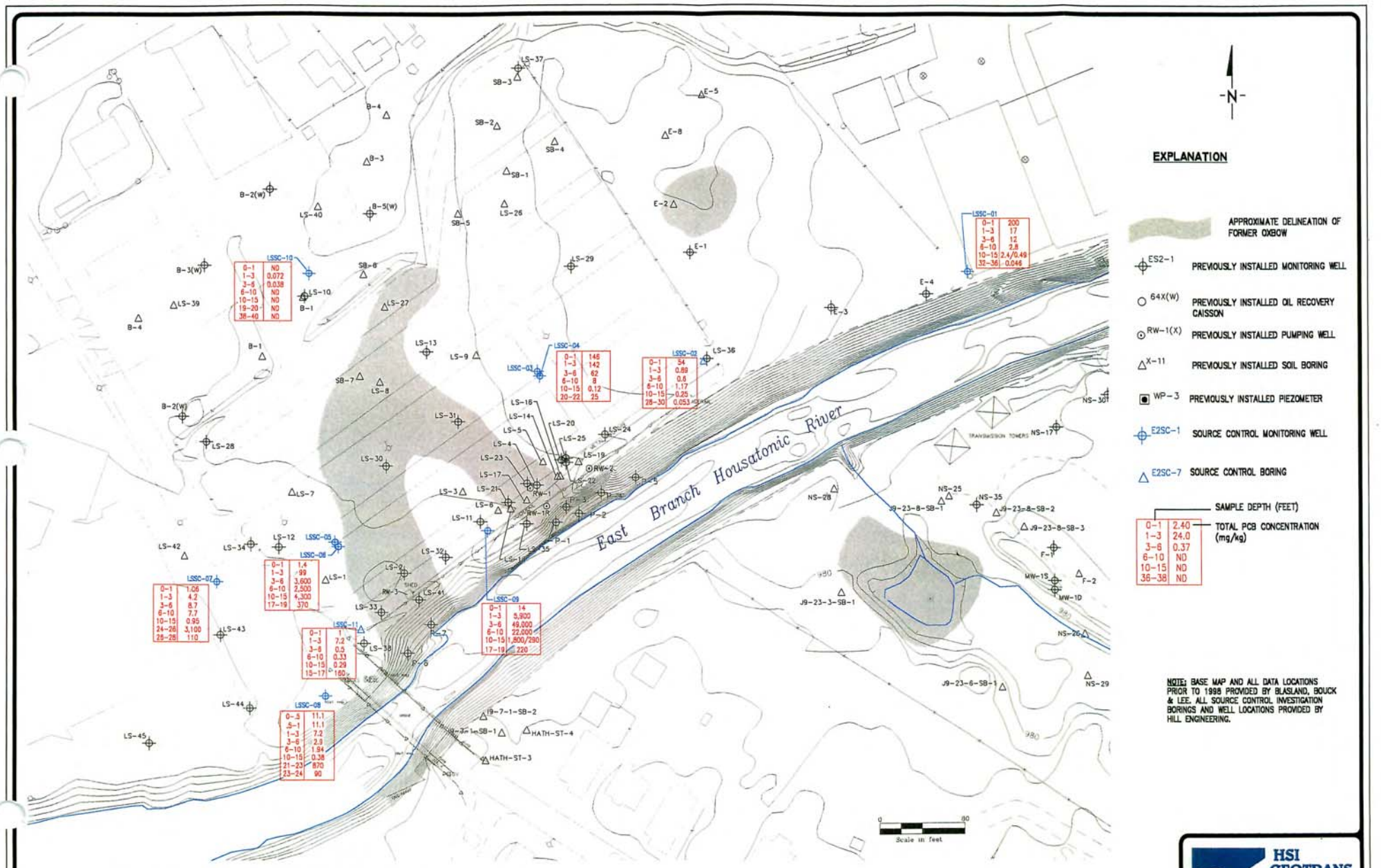


Figure 4-6 Map of Total PCB Concentrations, Lyman Street Site

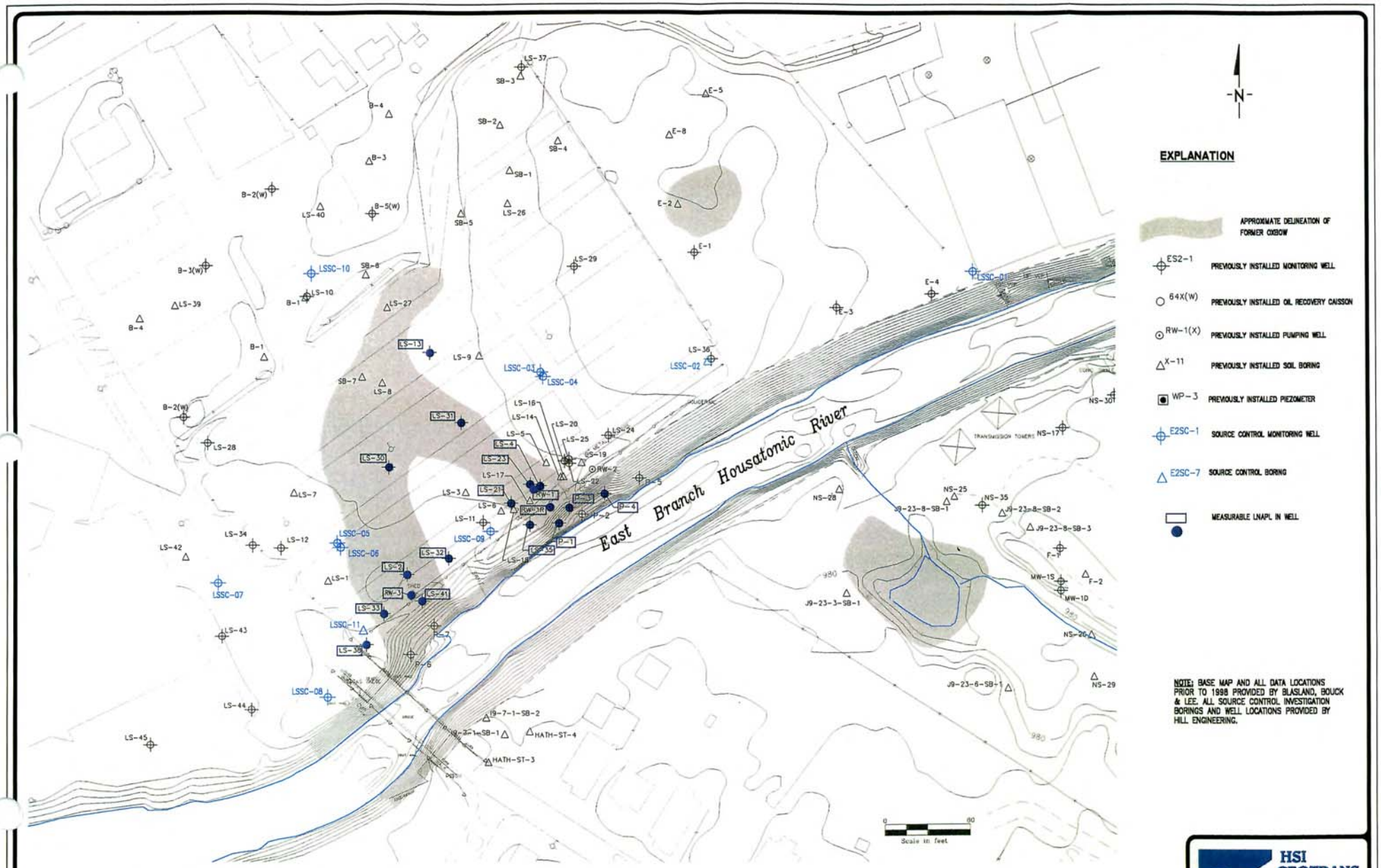


Figure 4-7 Extent of LNAPL, Lyman Street Site

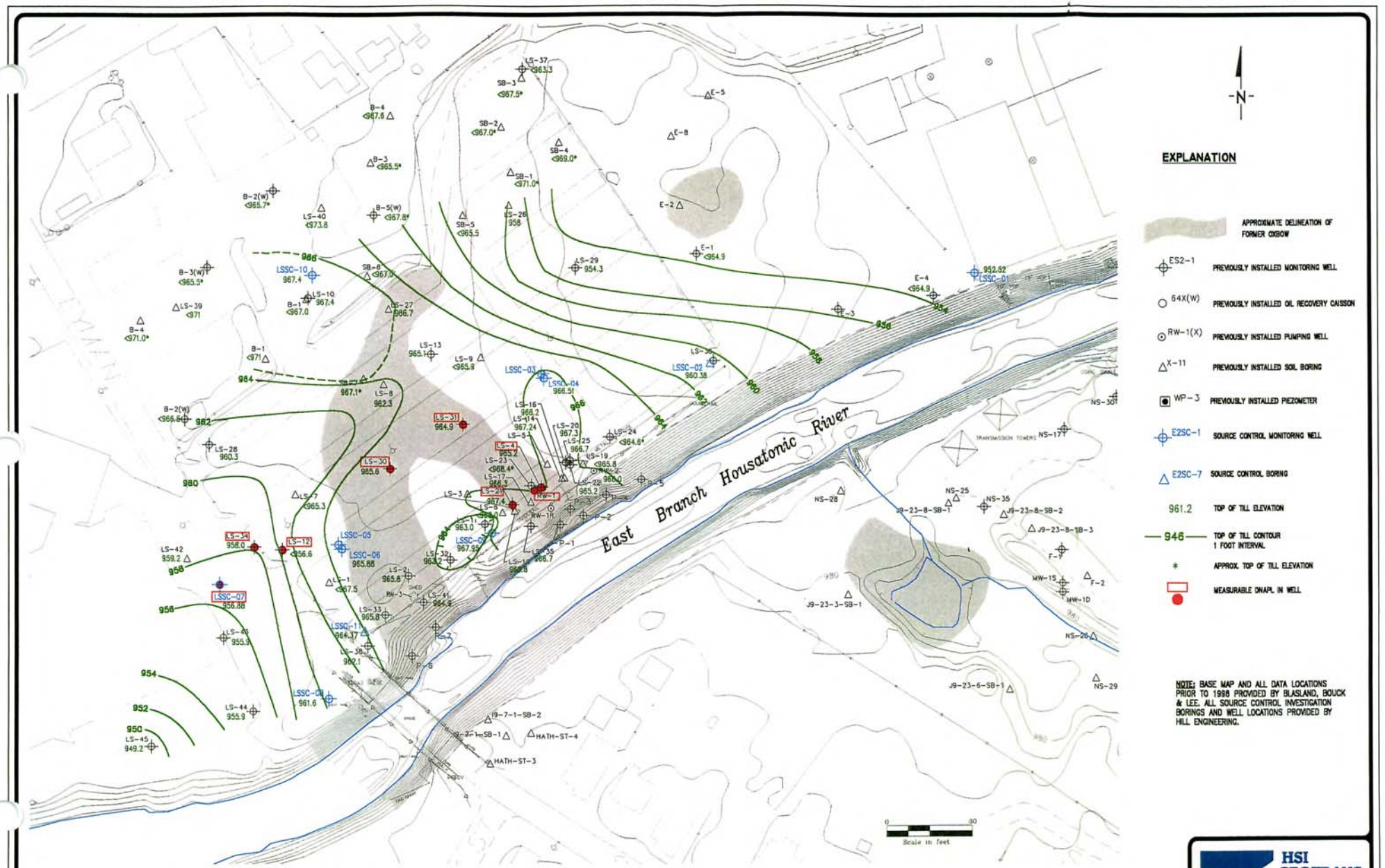


Figure 4-8 Extent of DNAPL, Lyman Street Site

5 OVERVIEW OF HYDROGEOLOGIC CONDITIONS ALONG THE FIRST ½ MILE

The geologic and seismic refraction data collected during the 1998-1999 Source Control investigations along the First ½ Mile have been evaluated along with the extensive hydrogeologic data available from previous investigations. Evaluation of these data has focused on the geologic conditions that would affect NAPL occurrence and migration in the areas adjacent to the First ½ Mile. One significant geologic condition pertinent to potential DNAPL occurrence, is the low permeability till layer that underlies the sites.

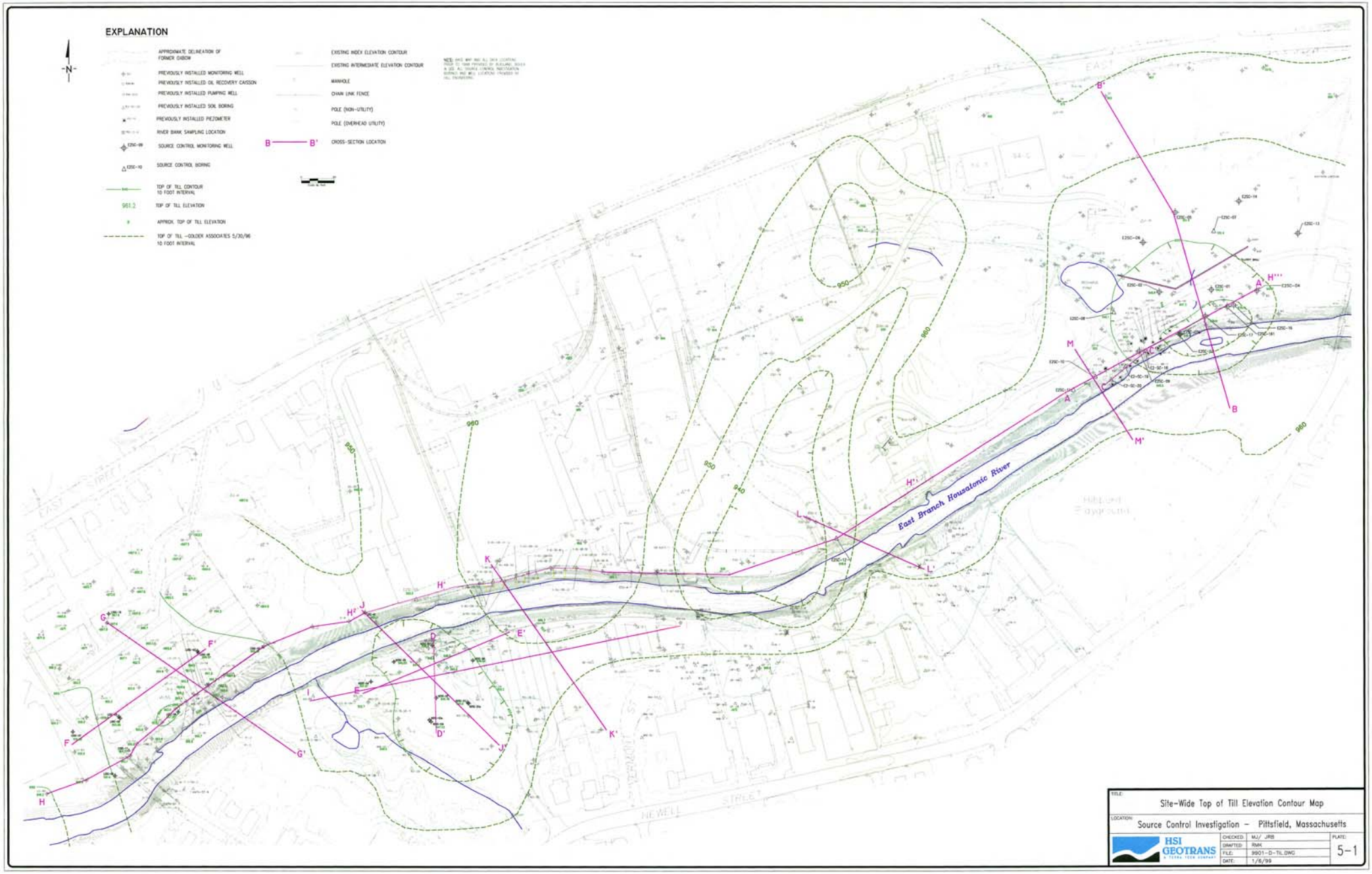
Figure 5-1 is a site-wide elevation contour map of top of the low permeability till surface. The till layer appears to be a barrier to the downward migration of DNAPL (if present). Where DNAPL is observed, it appears to have accumulated or pooled on this surface. DNAPL has not been observed to penetrate the till where the till has been sampled. Fine-grained geologic deposits, such as this till layer, are known to create capillary pressure barriers and have significant influence on NAPL migration. The top of till contour map shows that, in general, the till surface slopes from north to south. Depressions in the till surface are present beneath the East Street Area 2 site, near the 64X oil recovery system and in the central portion of that site, near monitoring well 95-27. A depression is also indicated in the till surface at the Newell Street Area II site. DNAPL has been observed in the depressions near the 64X oil recovery system and at Newell Street Area II. In both these areas, the DNAPL occurs at depths significantly below the Housatonic River bed and as such, does not appear to be a source to the river. DNAPL is currently being monitored and manually removed from a number of wells at both of these sites. Additionally, as previously mentioned, an automated DNAPL removal system is being installed in three wells at Newell Street Area II and an engineering evaluation for a fourth well is underway. DNAPL has not been observed in the till-surface depression at East Street Area 2 near monitoring well 95-27.

DNAPL has also been observed to be associated with more gentle undulations or localized troughs in the till surface west of Building 68, in the East Street Area 2 site and at the Lyman Street site. In the Building 68 area, DNAPL was detected in two wells located near the riverbank. A sheet pile barrier has already been installed in this area and relatively small amounts of DNAPL were recovered from the wells. This area is subject to ongoing monitoring/DNAPL removal. At the Lyman Street site, the till surface appears to locally slope northward away from the river. DNAPL appears to be located in a trough which slopes northward away from the river (towards the central portion of the parking lot) and then bends westward towards Lyman Street. DNAPL has not been found in the wells or well points located closest to the river.

Site wide stratigraphy is shown on Figures 5-2 to 5-8. Figures 5-2 and 5-3, which are cross sections H-H^{111} and I-I^{1}, are aligned approximately parallel to the river. Cross section H-H^{111} is aligned along the north side of the river and passes through the Lyman Street and East Street Area 2 sites. Cross-section I-I^{1} is parallel to the southern side of the river and passes through the Newell Street Area I and II sites. Figure 5-4 to 5-8 are cross sections which are oriented perpendicular to the river. These sections are based on the geologic data from borings/wells which is supplemented with data from the seismic refraction surveys. The data from these surveys indicate that the dense till layer corresponds to a relatively high velocity refraction layer. While the elevation of this layer does not always correlate precisely with the geologic data from the borings, it is believed that the relative topography of the till layer is approximated by the refraction data. Based on the available data, the low permeability till unit appears to be continuous beneath the sites along the entire First ½ Mile.

With regard to LNAPL occurrence along the First ½ Mile, the recent drilling program confirmed the existing understanding of the lateral extent of LNAPL. These areas are subject to ongoing remediation activities which includes three groundwater/LNAPL recovery systems at the Lyman Street site and seven groundwater/LNAPL recovery systems at the East Street Area 2 site. The performance of these systems in recovering LNAPL and controlling migration is discussed in more detail in the annual/semi-annual assessment reports for these

sites. In addition to the active pumping systems, weekly monitoring and manual removal of LNAPL is also being conducted at the single well at the Newell Street Area II site (NS-10) where very small quantities of LNAPL have been detected. Manual removal is also being performed in select wells at the East Street Area 2 and Lyman Street sites.



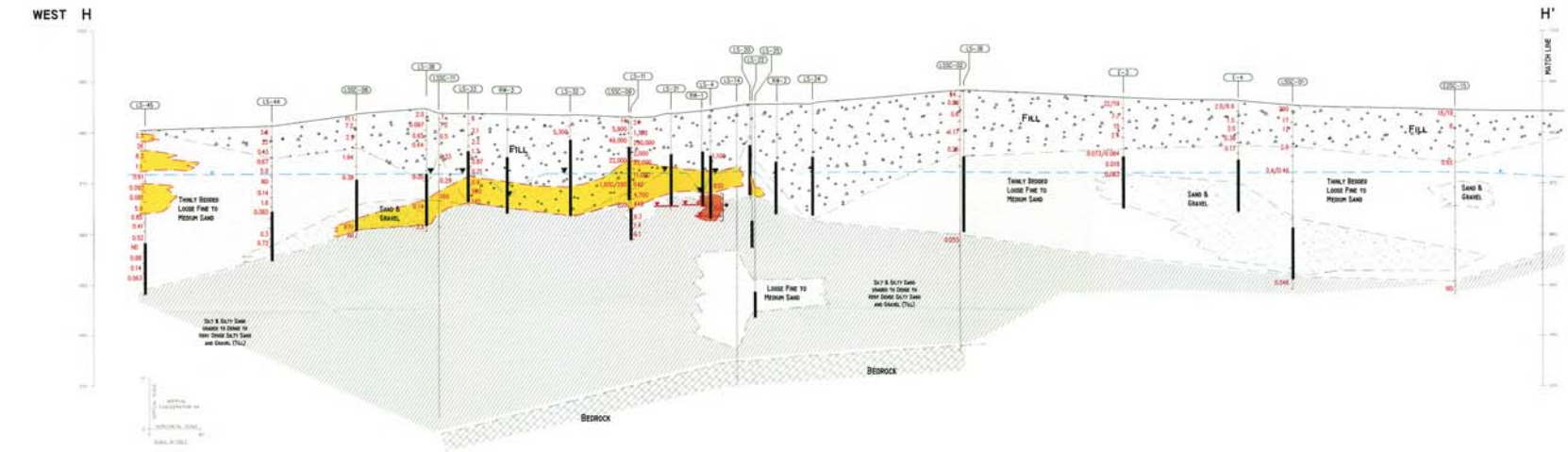
TITLE: Site-Wide Top of Till Elevation Contour Map

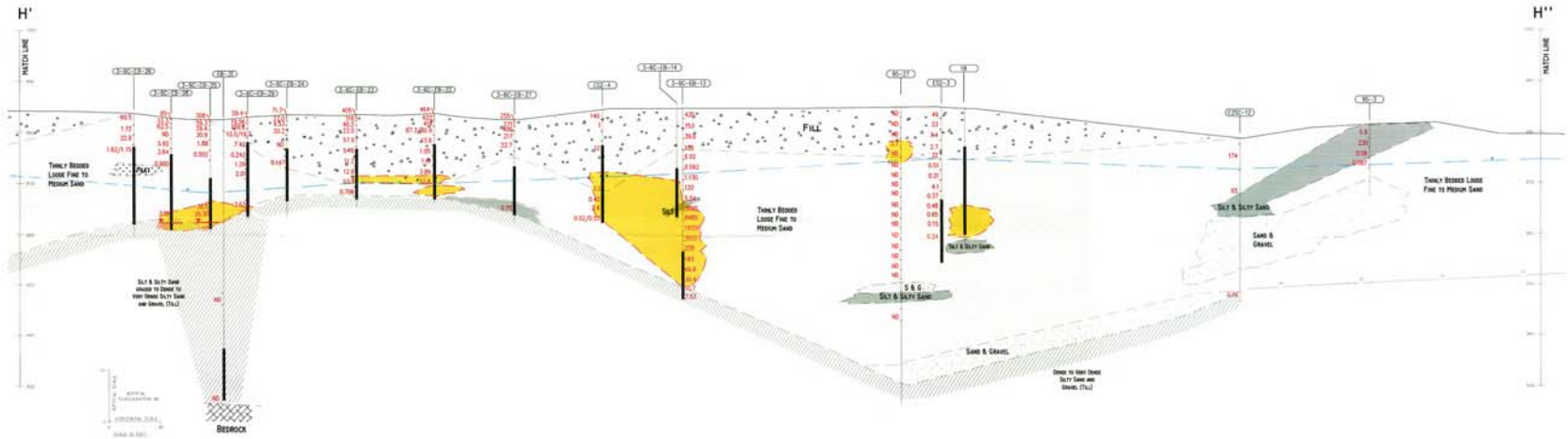
LOCATION: Source Control Investigation – Pittsfield, Massachusetts

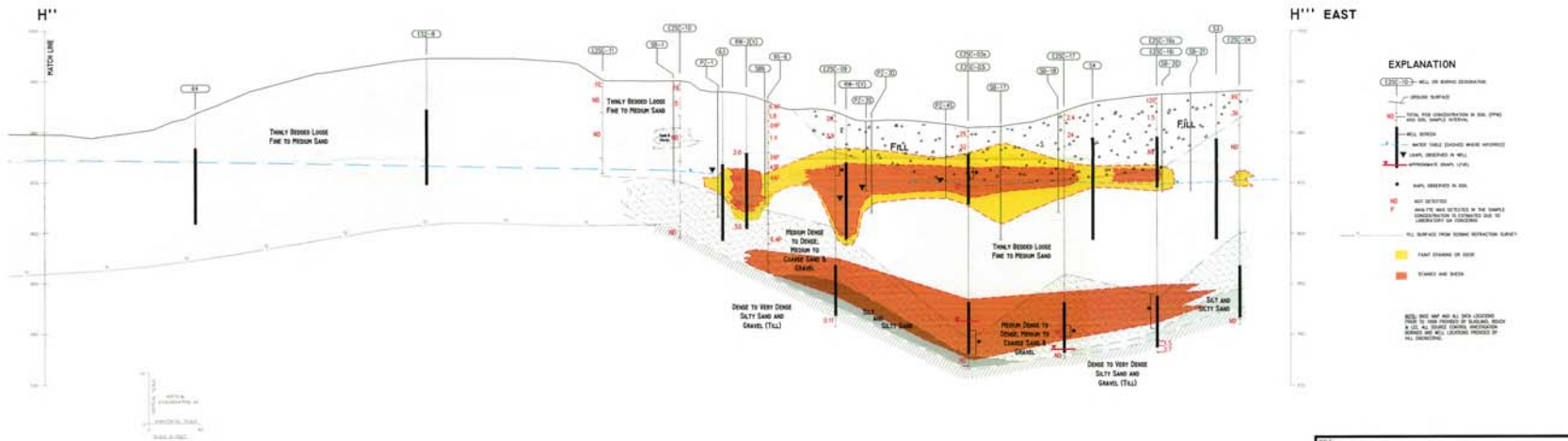
HSI GEOTRANS A TERRA TECH COMPANY

CHECKED:	MJ/ JRB
DRAFTED:	RMK
FILE:	9801-D-TIL.DWG
DATE:	1/6/99

PLATE: 5-1







TITLE:	Cross-Section H-H'''
LOCATION:	GE Pittsfield
HSI GEOTRANS	CHECKED: JRB
	DRAFTED: RWK
	FILE: 9907la-h
	DATE: 2/1/99
	FIGURE: 5-2

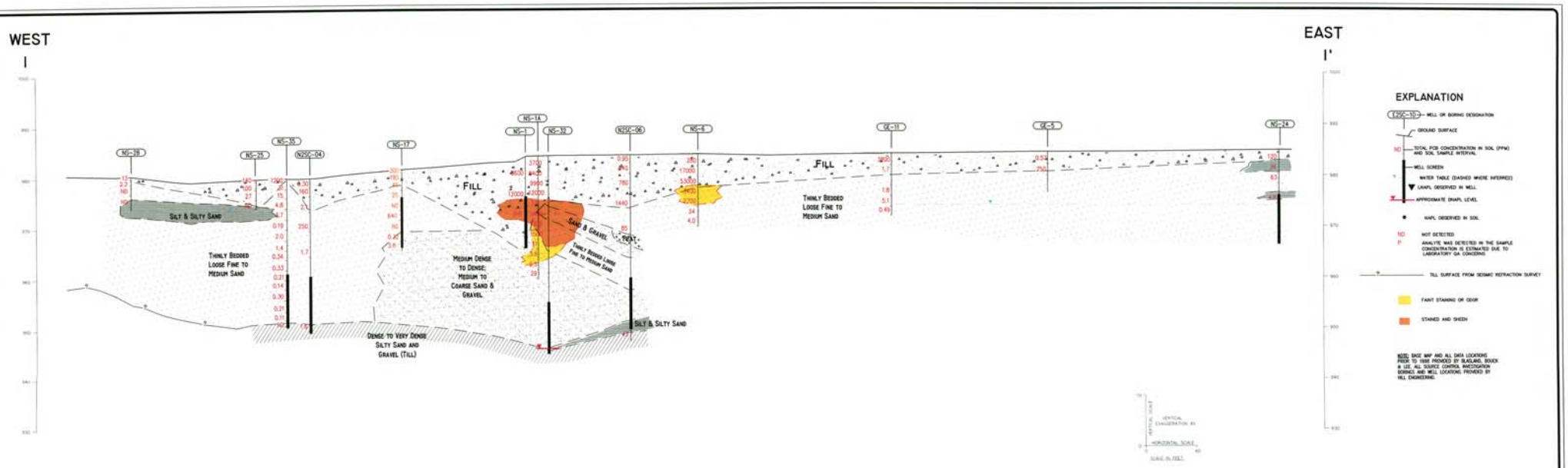


Figure 5-3 Cross-Section I-I'

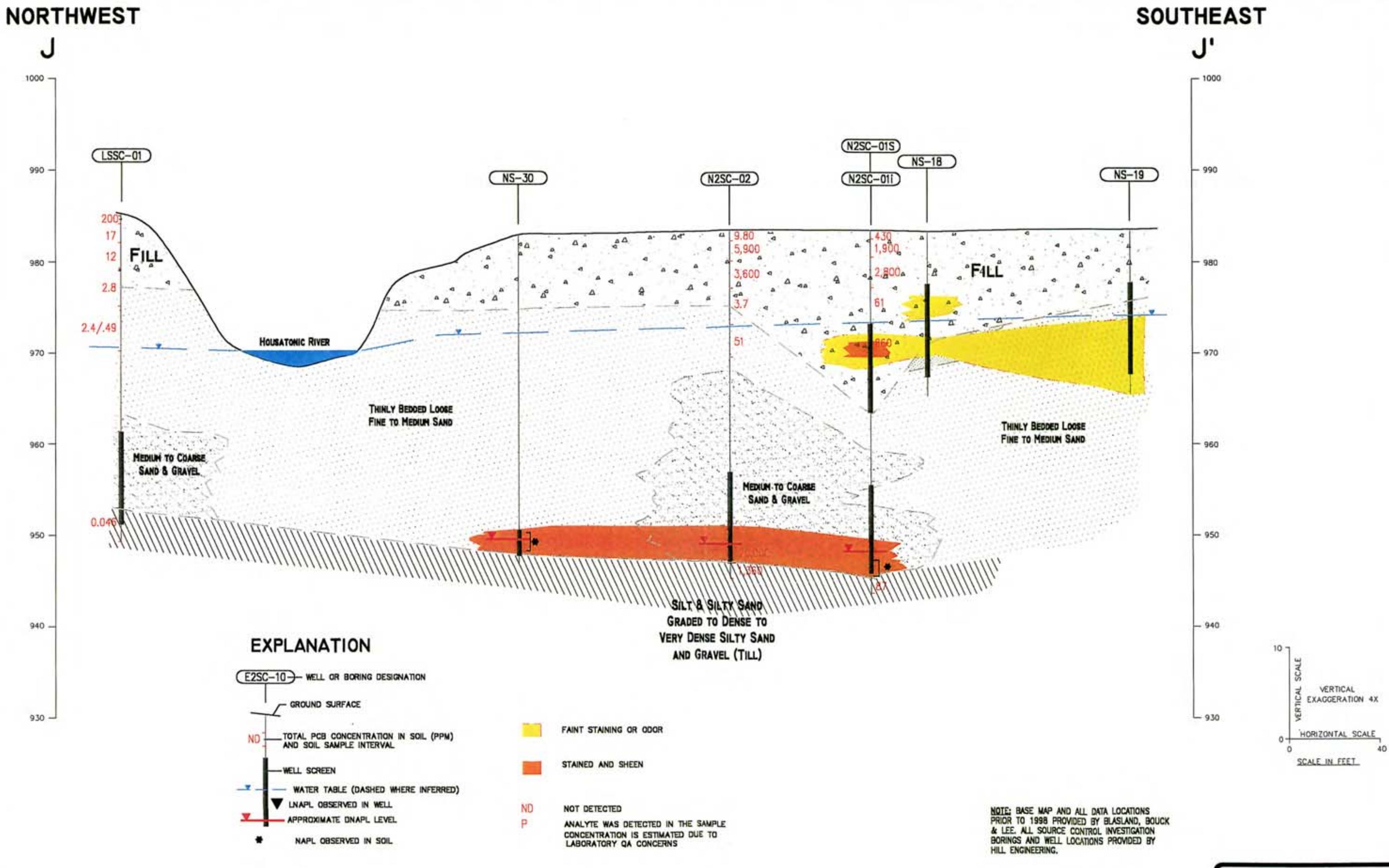


Figure 5-4 Cross-Section J-J'

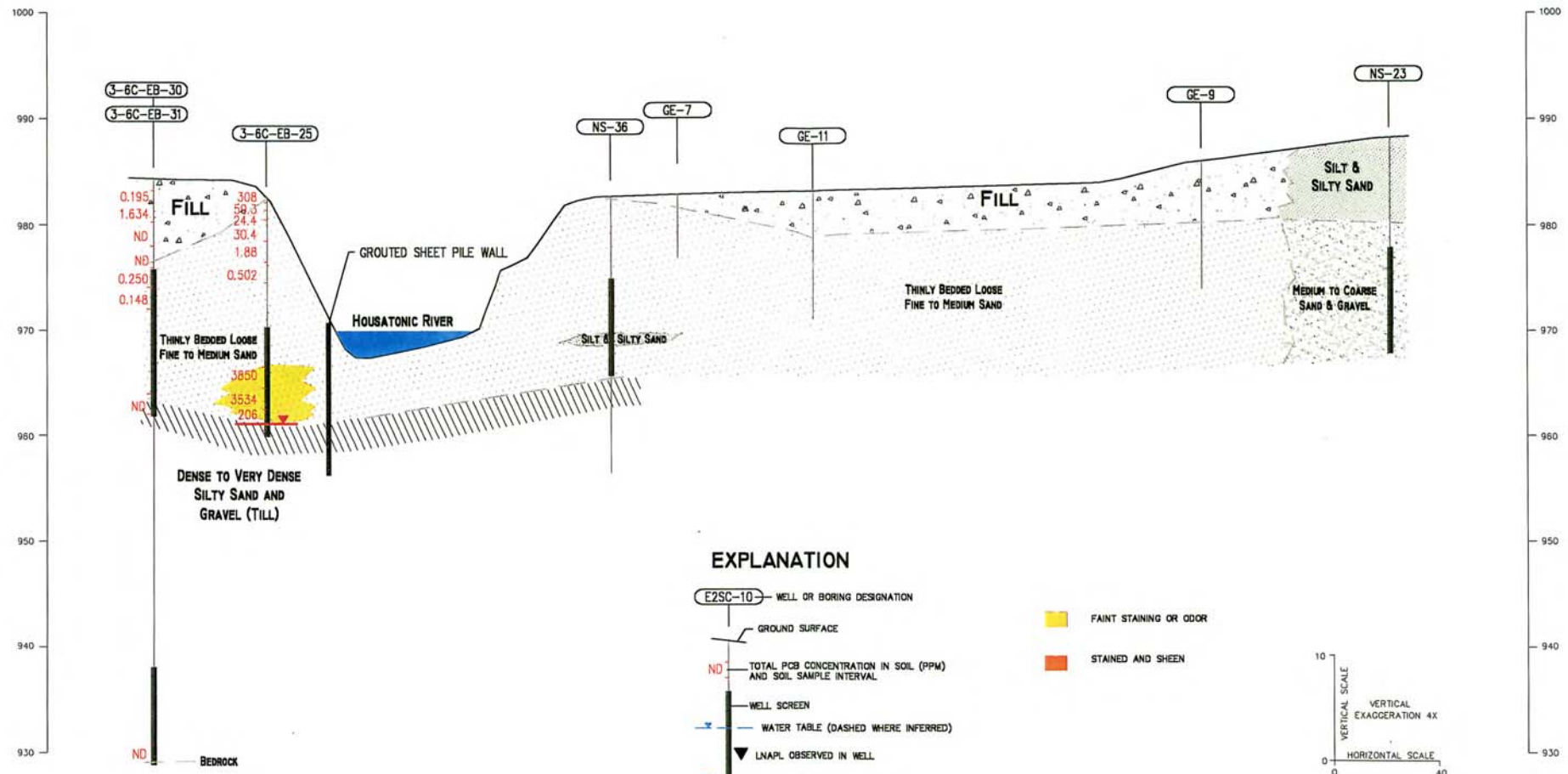


Figure 5-5 Cross-Section K-K'

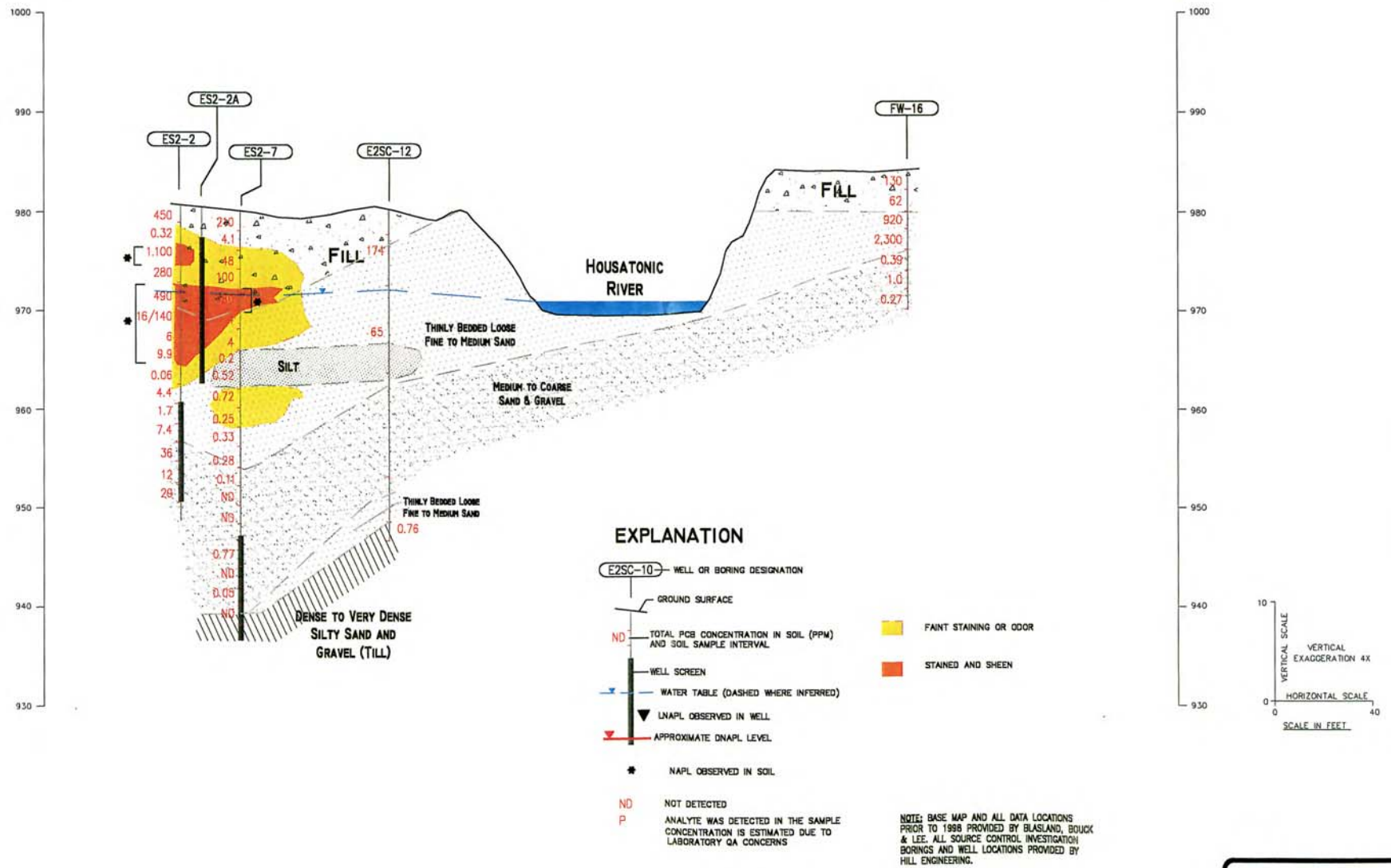
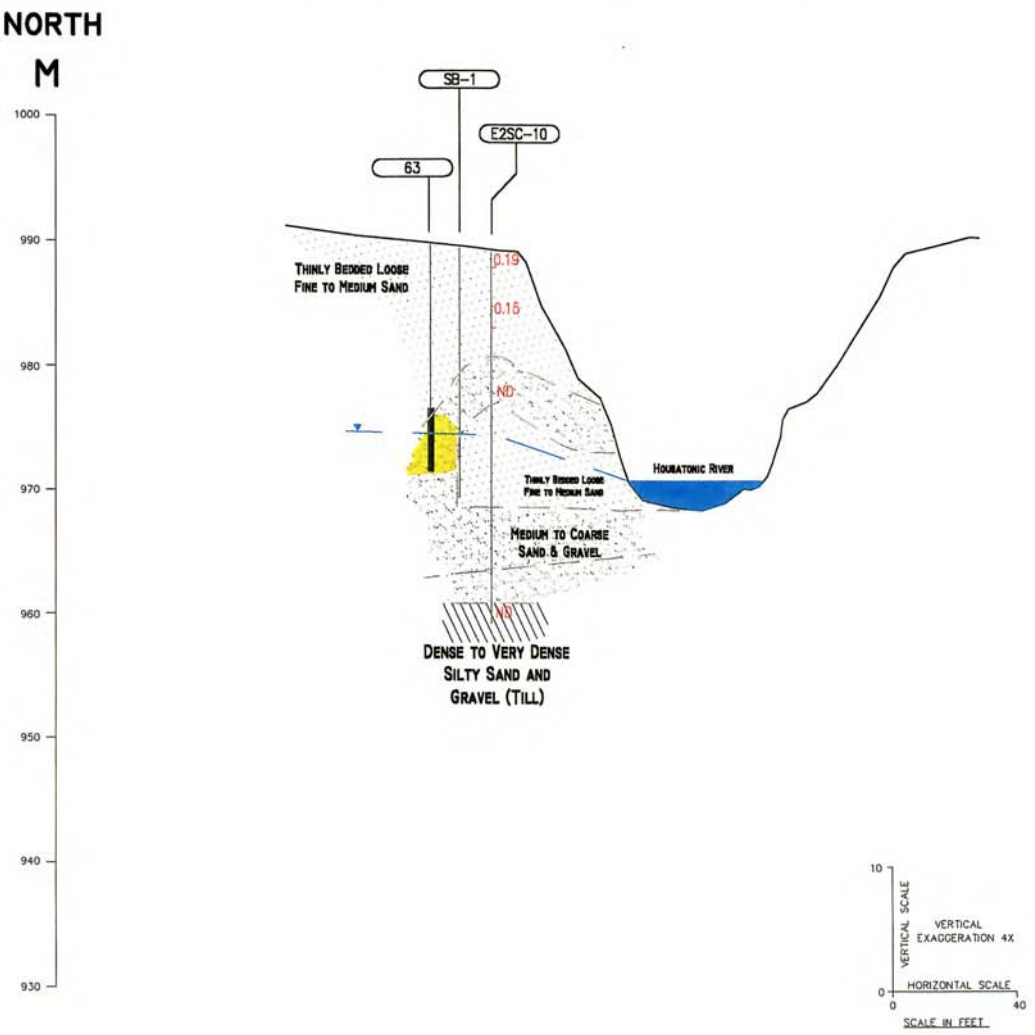


Figure 5-6 Cross-Section L-L'



EXPLANATION

- E2SC-10 — WELL OR BORING DESIGNATION
- GROUND SURFACE
- ND — TOTAL PCB CONCENTRATION IN SOIL (PPM) AND SOIL SAMPLE INTERVAL
- WELL SCREEN
- WATER TABLE (DASHED WHERE INFERRED)
- LNAPL OBSERVED IN WELL
- APPROXIMATE DNAPL LEVEL
- NAPL OBSERVED IN SOIL
- ND — NOT DETECTED
- P — ANALYTE WAS DETECTED IN THE SAMPLE CONCENTRATION IS ESTIMATED DUE TO LABORATORY QA CONCERNS
- FAINT STAINING OR ODOR
- STAINED AND SHEEN

NOTE: BASE MAP AND ALL DATA LOCATIONS PRIOR TO 1998 PROVIDED BY BLASLAND, BOUCK & LEE. ALL SOURCE CONTROL INVESTIGATION BORINGS AND WELL LOCATIONS PROVIDED BY HILL ENGINEERING.

Figure 5-7 Cross-Section M-M'

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6812-e-M.dwg

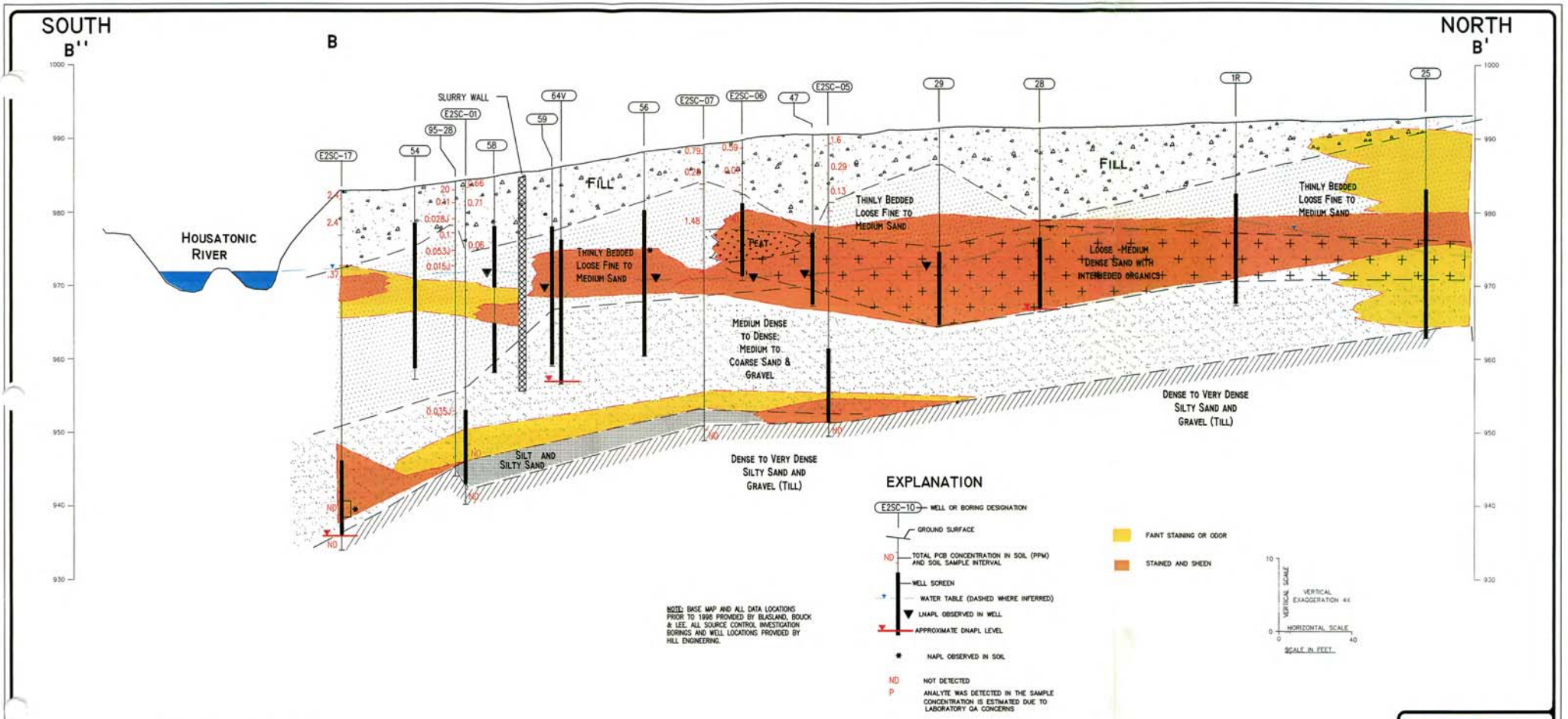

Figure 5-8 Cross-Section B-B'

6 PROPOSED ADDITIONAL INVESTIGATIONS

To further evaluate the potential extent of DNAPL at the Newell Street Area II site and Lyman Street site, additional borings and monitoring wells are proposed. To evaluate the southern extent of the DNAPL at the Newell Street Area II site, two borings are proposed. The first boring will be drilled adjacent to existing monitoring well NS-19. The second boring will be drilled approximately 100 feet south of the newly installed monitoring well cluster N2SC-03. The proposed locations of these additional borings are shown on Figure 6-1. All of these wells will be drilled to the basal till layer beneath the site. If indications of DNAPL are observed during drilling, wells will be installed in the borings.

At the Lyman Street site, two additional borings are proposed to further evaluate the extent of the DNAPL west of Lyman Street. One boring will be drilled between the building at 10 Lyman Street and newly installed monitoring well LSSC-07. The second boring will be drilled approximately 40 feet south of LSSC-07. The proposed locations of the additional borings are shown on Figure 6-2. The two borings will be drilled to the basal till. If indications of DNAPL are observed during drilling, wells will be installed in the borings.

In addition to the data for the Lyman Street and Newell Street Area II sites, the existing data for East Street Area 2 was further reviewed to determine the need for additional investigations. Based on this evaluation, borings are proposed to evaluate an isolated occurrence of LNAPL near well 50. This well periodically contains relatively small amounts of LNAPL and is located 300 feet north of the river. During manual removal activities conducted in 1998, approximately 0.13 gallons of LNAPL were recovered from the well. Although no LNAPL has been detected in three wells (95-2, ES2-12, 64) located downgradient of well 50, GE proposes two new wells in this area. The first well will be installed approximately forty feet south of monitoring well 50. The second shallow monitoring well will be installed

approximately 70 feet west of monitoring well 95-2. Figure 6-3 shows the proposed location for the additional wells. The wells will be drilled approximately 10 feet below the water table and a screen spanning the water table will be installed.

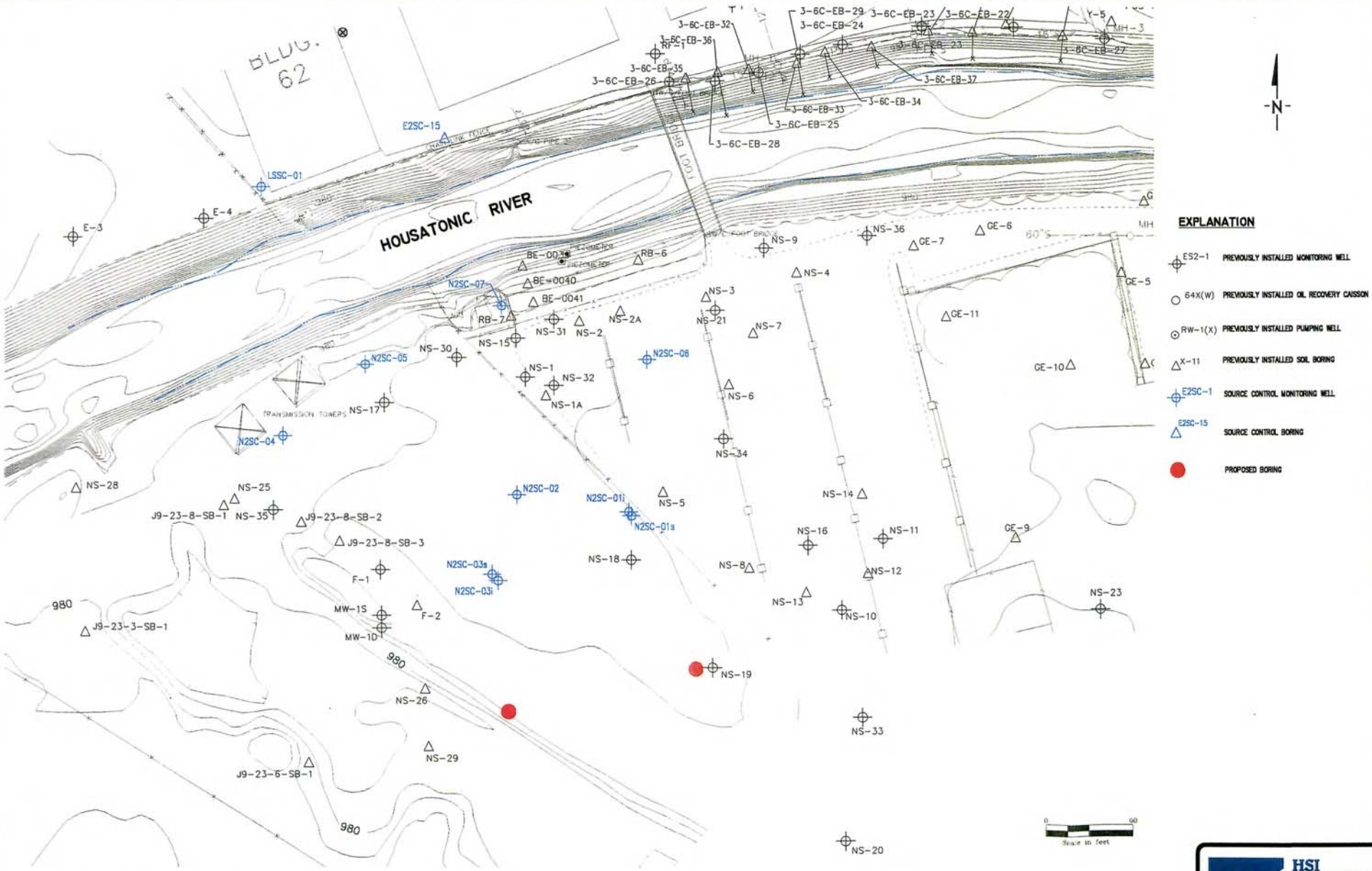

Figure 6-1 Proposed Additional Boring Locations, Newell Street Area II

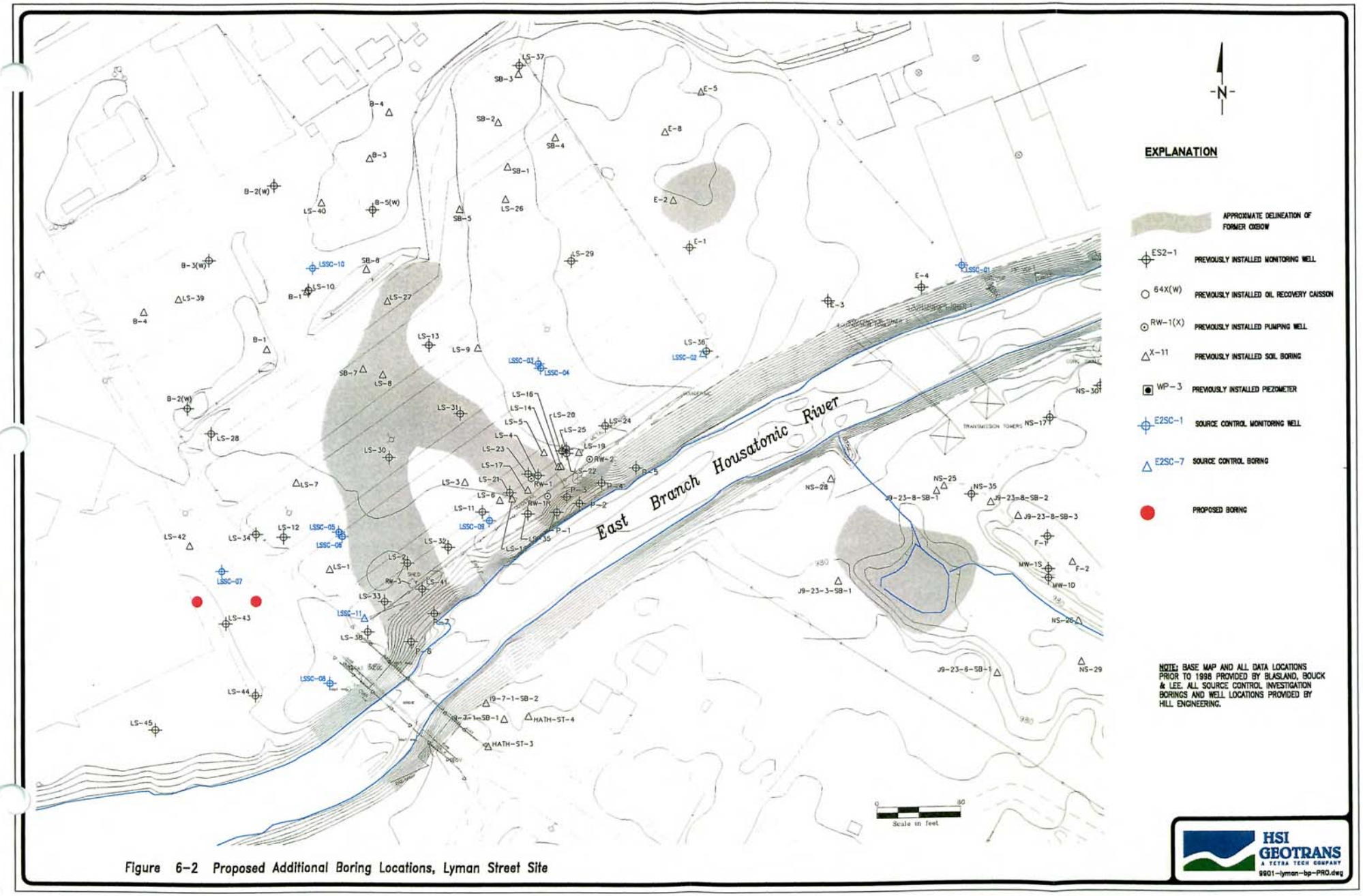

Figure 6-2 Proposed Additional Boring Locations, Lyman Street Site

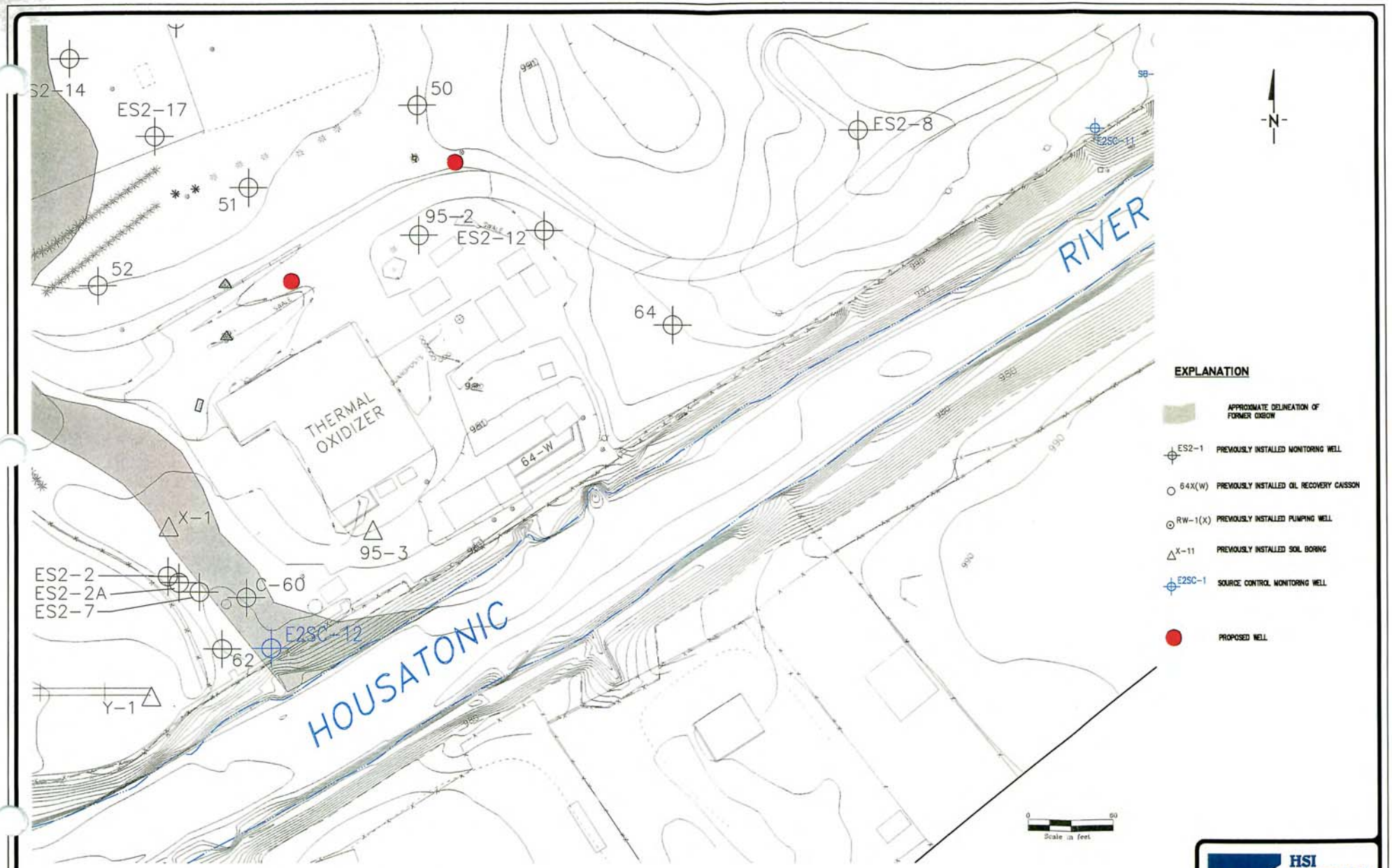

Figure 6-3 Proposed Additional Boring Location, East Street Area II

7 REFERENCES

BBL, 1998a, *Source Control Work Plan - Upper Reach of Housatonic River (First ½ Mile)*, September, 1998.

BBL 1998b, *Revised Sampling and Analysis Plan/Data Collection and Quarterly Assurance Plan*, October, 1998.

BBL, 1999, *Proposal for Supplemental Source Control, Containment/Recovery Measures*, January 1999.

Golder, 1998, *Draft Effectiveness Evaluation of Short-Term Measures*, Lyman Street (Oxbow Area D), Pittsfield, Massachusetts, November 1998.

APPENDIX A

BORING LOGS AND WELL CONSTRUCTIONS DIAGRAMS

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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	LSSC-01
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	1/5/99
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	985.22	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	986.95	**DEPTH TO WATER**	
LOGGED BY	NSB	**GROUND WATER ELEVATION**	
NORTHING	532801.3607	**EASTING**	131420.0928

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0		SS01					Loose, Dark yellowish Brown, SAND w/ little gravel, trace coal fragments, dry, well graded, SW, (Fill).	1.0
0	9 8 5 4	SS02					Medium dense, Moderate Red, COAL ASH, dry, well graded, SW, (Fill).	3.0
0	6 2 2 2	SS03					Similar to above except, trace gravel.	5.0
0	5 8	SS04		5			Loose, Moderate reddish Brown, COAL ASH, dry, well graded, SW, (Fill).	6.0
0	5 8 11 16	SS05					Top 0.5 Same as above. Middle 0.5 Medium dense, Grayish Brown, fine SAND w/ little silt, moist, well graded, SW. Bottom 0.5 Medium Dense, Olive Gray, GRAVEL and COAL FRAGMENTS, moist, well graded, GW, (Fill).	8.0
0	5 4 4 6	SS06					Loose, Pale yellowish Brown, fine SAND w/ trace silt and organics, moist, well graded, SW.	10.0
0	3 2 2 2	SS07		10			Same as above.	12.0
0	4 4 4 4	SS08					Similar to above except, wood fragments.	14.0
0	2 2	SS09					Loose, Olive Gray, SAND w/ trace organics, wet, well graded, SW.	15.0
0	2 3 4 6	SS10		15			*Top 1.4 Same as above. Bottom 0.2 Similar w/ little* gravel, subround.	17.0
0	3 3 4 3	SS11					Same as above (Bottom).	19.0
0	3 3	SS12					Loose, Olive Gray, SAND w/ little gravel and silt, wet, well graded, subround, SW.	20.0
0	4 5 5 3	SS13		20			Loose, Olive Gray, SAND w/ little silt, few gravel, wet, well graded, SW-GW.	22.0
0	7 7 6 7	SS14					Medium dense, Light olive Gray, gravelly SAND w/ little silt, wet, well graded, SW-GW.	24.0
0	7 5 7 6	SS15		25			Similar to above except, few silt.	26.0
0	4 5 4 5	SS16					Same as above.	28.0
0	14 10 10 8	SS17					Loose, Olive Gray, SAND w/ few gravel, wet, well graded, subround, SW-GW.	30.0
0	11 13 13 11	SS18		30			Same as above.	32.0
0	18 16 18 17	SS19					Top 0.7 Same as above. Bottom 0.3 Medium dense, Light olive Gray, SILT, wet, well graded, ML.	34.0
N/A	16 10 8	SS20		35			Same as above (Bottom).	36.0

Continued Next Page

WELL DIAGRAM

- Portland / Volclay Grout
- Bentonite Seal
- #0 Filter Sand
- .010 Slot 2" PVC Schd 40 Screen
- 1' 2" PVC Schd 40 Sump

BORING_WELL POL... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** LSSC-01

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 1/5/99

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM	
	9									

BORING_WELL P00s...J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001
PROJECT NAME Source Control Upper Reach Housatonic River
LOCATION Pittsfield, Massachusetts
DRILLING METHOD HSA
SAMPLING METHOD SS
GROUND ELEVATION 988.38
TOP OF CASING None
LOGGED BY NSB
NORTHING 532718.6255

BORING/WELL NUMBER LSSC-02
DATE DRILLED 12/22/98
CASING TYPE/DIAMETER 2" PVC
SCREEN TYPE/SLOT .010 Slot 2" PVC
GRAVEL PACK TYPE #0 Silica Sand
GROUT TYPE/QUANTITY Portland/Volclay
DEPTH TO WATER
GROUND WATER ELEVATION
EASTING 131172.6235

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		SS01					Auger sample through Asphalt. Loose, Moderate olive Brown, SAND w/ few gravel, dry, well graded, subround, SW-GW. (Fill)	1.0	
0	5 4 3	SS02					Loose, Dark yellowish Brown, SAND w/ some coal fragments, little fines and organics, dry, well graded, SW, (Fill).	3.0	
0	5 2 3	SS03					Top 0.3 Same as above. Bottom 0.7 Loose, Moderate reddish Brown to Moderate Brown, coarse grained COAL ASH, dry, well graded, SW, (Fill).	5.0	
0	5 6 3	SS04		5			Same as above (Bottom).	6.0	
0	3 3 4	SS05					Top 1.0 Same as above. Bottom 0.2 Loose, Dusky Yellow to Moderate olive Brown, COAL ASH, dry, well graded, SW, (Fill).	8.0	
26	3 1 2	SS06					Loose, Dark Gray to Olive Gray, COAL ASH w/ little silt, dry, well graded, SM, (Fill).	10.0	
52	2 2 2	SS07		10			Loose, Moderate reddish Brown, COAL ASH, dry (wet tip), well graded, SM, (Fill).	12.0	
527	2 1 2	SS08					Top 0.6 Same as above. Bottom 0.7 Loose, Light olive Gray, fine SAND, moist, well graded, lamianted, SW.	14.0	
8.6	2 2 3	SS09					Same as above (Bottom).	15.0	
135	3 3 5	SS10		15			Top 0.7 Loose, Light olive Gray, coarse - fine SAND, moist, well graded, interbedded, SW.	17.0	
174	3 3 5	SS11					Similar to above except, little gravel, subround.	19.0	
234	4 5 7	SS12					Same as above.	20.0	
26	9 9 7	SS13		20			Loose, Light olive Gray, Gravel w/ few sand, wet, well graded, subround to subangular, GW-SW	22.0	
0	3 2 3	SS14					Similar to above except,Medium dense, Fe staining.	24.0	
0	6 6 6	SS15					Same as above.	26.0	Portland / Volclay Grout
0	8 11 11	SS16		25			Similar to above except, Dense, trace silt.	28.0	
0	10 9 18	SS17					Medium Dense, Light olive Gray to Dusky Yellow, SILT w/ few fine sand, wet, well graded, ML.	30.0	
61	16 16 36	SS18		30			Similar to above w/ few gravel, subangular (Till).	32.0	
234	18 16 10	SS19					Top 1.1 Same as above. Bottom 0.2 Dense, Dark yellowish Orange, fine SAND w/ little gravel, wet, well graded, SW.	34.0	
26	10 8 5	SS20		35			Very dense, Dark yellowish Orange, fine SAND w/ some silt, wet, well graded, ML.	36.0	
	19 12 19								
	14 17 19								
	57 39 42								

Continued Next Page

BORING_WELL P0... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** LSSC-02

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 12/22/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
43	34 42 34 53	SS21					Same as above.	38.0	
28	50/0.2	SS22					Very dense, Dark yellowish Orange, fine SAND w/ some silt, few gravel, wet, well graded, (Till).	40.0	
N/A	50/0	SS23		40			No Recovery.	42.0	
4.8	52 42 28 18	SS24					Very Dense, Dusky Yellow, SILT, wet, well graded, (weathered limestone cobble in spoon) (Till).	44.0	
0	37 27 32 27	SS25		45			Similar too above except, few gravel, subangular.	46.0	
0	26 21 17 16	SS26					Dense, Moderate olive Brown, fine SAND and SILT, wet, well graded, (weathered limestone cobble in spoon)(Till)	48.0	
0.8	23 13 100/0.4	SS27					Same as above	50.0	
N/A		CORE		50			Medium strong, Very pale Orange, Meta-limestone, moderate weathering, fractures weathered, Fe staining, calcium matrix.	51.5	

BORING_WELL POL... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

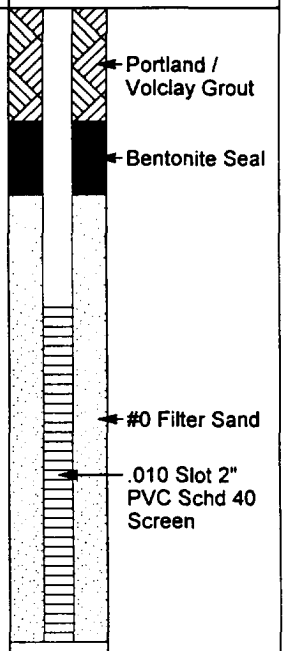
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001
PROJECT NAME Source Control Upper Reach Housatonic River
LOCATION Pittsfield, Massachusetts
DRILLING METHOD HSA
SAMPLING METHOD SS
GROUND ELEVATION 987.05
TOP OF CASING 988.96
LOGGED BY NSB
NORTHING 532708.7701

BORING/WELL NUMBER LSSC-03
DATE DRILLED 12/16/98
CASING TYPE/DIAMETER 2" PVC
SCREEN TYPE/SLOT .010 Slot 2" PVC
GRAVEL PACK TYPE #0 Silica Sand
GROUT TYPE/QUANTITY Portland/Volclay
DEPTH TO WATER
GROUND WATER ELEVATION
EASTING 131015.295

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
N/A	N/A	SS06		5			Top 0.5 Medium dense, Moderate reddish Brown, SAND, dry, well gradded, SW. Bottom 0.8 Moderate Brown, SAND w/ coal fragments, dry, well gradded, SW (FILL).	8.0
				10				
				15				

WELL DIAGRAM



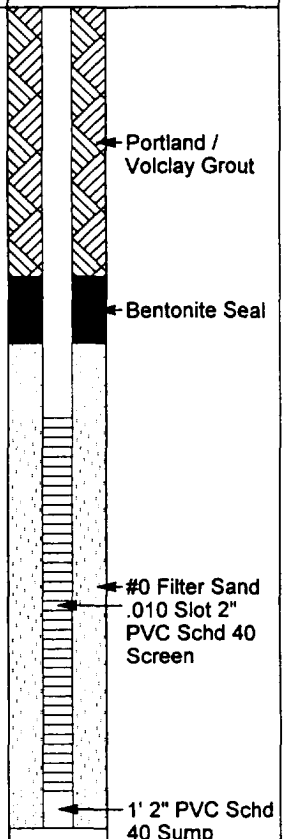
BORING_WELL PO... .GJ HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	LSSC-04
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	12/15/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	987.01	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	988.9	**DEPTH TO WATER**	
LOGGED BY	NSB	**GROUND WATER ELEVATION**	
NORTHING	532704.5562	**EASTING**	131017.6186

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.5		SS01					Auger sample through Asphalt. Moderate yellow Brown, SAND, few gravel, dry, well graded, SW, (fill)	1.0
1	7 4 3 2	SS02					Loose, Moderate Brown to Black, SAND, Little gravel and coal fragments, dry, well graded, SW, (fill)	3.0
1.5	3 1 1 1	SS03					Very loose,Moderate redish Brown, SAND, Little fines, dry, well graded, SW, (fill)	5.0
3	2 1	SS04		5			Very loose,Moderate Brown, SAND, little coal fragments, few gravel, moist, well graded, SW (fill)	6.0
50	2 3 6 8	SS05					Loose, Moderate Brown to Moderate reddish Brown, SAND, some gravel and coal fragments, moist, well-graded, SW, (fill)	8.0
5	3 4 19 20	SS06					Dense, Moderate Brown, SAND with coal fragments, moist, SW (fill), bottom 0.2 weathered cobble, Light gray	10.0
3	54	SS07		10			Light gray to White, weathered cobble in spoon.	12.0
3	3 1 3 5	SS08					Top 1.0 Loose, Dark Gray, organic SAND w/ little fines, wet, well graded, SM-Pt. Bottom 0.5 Loose, Olive Gray, SAND, well graded, SW.	14.0
4	2 3	SS09					Loose, Olive Gray, SAND with little fines, wet, well graded, SW	15.0
6	3 5 7 5	SS10		15			Top 0.3 Wood core, Bottom 0.9 Dense, Olive Gray, medium-course SAND, wet, well graded, SW	17.0
4	21 12 19 20	SS11					Medium dense, Olive Gray, medium-course SAND w/ few interbeded organics, wet, well graded, SW	19.0
2	27 12	SS12					Medium dense, Moderate olive Gray, GRAVEL and course SAND, wet, well graded, angular, GW	20.0
1		SS13		20			Top 0.5 Olive Brown, GRAVEL w/ some sand, wet, well graded, angular, GW, Bottom 0.3 Olive Brown, SILT, few sand, wet, well graded, ML.	22.0



WELL DIAGRAM

BORING_WELL POU... HSI_MA.GDT 2/5/99

HSI GEOTRANS
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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	LSSC-05
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	12/15/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	983.31	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	984.87	**DEPTH TO WATER**	
LOGGED BY	NSB	**GROUND WATER ELEVATION**	
NORTHING	532549.2949	**EASTING**	130825.3651

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
				5			See Log for LSSC-06.	16.5	Portland / Volclay Grout Bentonite Seal #0 Filter Sand .010 Slot 2" PVC Schd 40 Screen
				10					
				15					

BORING_WELL P00... HSI_MA.GDT 2/5/99

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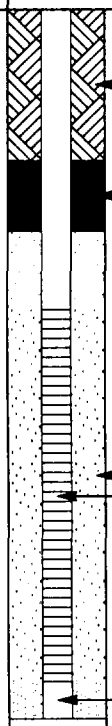
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	LSSC-06
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	12/15/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	983.44	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	985.04	**DEPTH TO WATER**	
LOGGED BY	NSB	**GROUND WATER ELEVATION**	
NORTHING	532545.3453	**EASTING**	130828.2062

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0		SS01					Auger sample through Asphalt. Moderate Brown, SAND with few GRAVEL, dry, well graded, SW (fill)	1.0
1.5	11 9 12 12	SS02					Top 0.5 Medium dense, Dark Gray, medium to fine SAND, dry, well graded, SW. Bottom 0.2 Medium dense, Light Brown to Yellowish Orange, SAND, dry, well graded, SW (fill).	3.0
13	13 9 6 5	SS03					Similar to above except, scrap metal and insulation paper (fill).	5.0
5	3 3	SS04		5			Top 0.4 Same as above. Bottom 0.3 Loose, Light Gray, SAND, dry, well graded, SW.	6.0
30	4 2 5 7	SS05					Light Gray to Moderate yellowish Brown, SAND w/ some silt, trace organics, dry, well graded, SM.	8.0
50	4 3 5 5	SS06					Top 0.8 Same as above (odor). Bottom 0.2 Loose, Light olive Gray, SAND, dry, well graded, laminated, SW.	10.0
50	3 2 3 2	SS07		10			Top 0.5 Same as above (Bottom). Bottom 1.3 Loose, Olive Gray, SAND w/ some silt, trace organics, wet, well graded, WT 11.5, SM.	12.0
30	2 2 4 4	SS08					Top 0.4 Same as above (Bottom). Bottom 0.5 Loose, Olive Grey, SAND, wet, well graded, SW.	14.0
300	1 3	SS09					Loose, Olive Gray, medium to coarse SAND w/ wood core in spoon, wet, well graded, product, SW.	15.0
200	9 7 8 9	SS10		15			Top 0.3 Same as above w/ no organics. Bottom 0.3 Similar to above Medium dense, GRAVEL w/ some sand.	17.0
250	9 5 5 7	SS11					Top 0.6 Same as above. Bottom 0.4 Medium Dense, Light olive Brown, SILT w/ trace gravel, wet, well graded.	19.0

WELL DIAGRAM



BORING_WELL PO... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	LSSC-07
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	12/18/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	982.88	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	982.61	**DEPTH TO WATER**	
LOGGED BY	NSB	**GROUND WATER ELEVATION**	
NORTHING	532512.772	**EASTING**	130714.0206

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0		SS01					Auger sample through Asphalt. Loose, Pale to Moderate yellowish Brown, SAND w/ some gravel, dry, well graded, subround, SW-GW (fill).	1.0
0	9 6 5	SS02					Top 0.3 Loose, Grayish Brown, SAND w/ few gravel, dry, well graded, SW. Bottom 0.3 Loose, Pale yellowish Brown, SAND, dry, well graded, SW (fill).	3.0
0	2 7 3 2 3	SS03					Loose, Pale yellowish Brown, COAL ASH (cemented) w/ some sand, dry, well graded, (Fill).	5.0
0	2 3	SS04		5			Loose, Grayish Brown, SAND w/ trace fines, dry, well graded, SW, (Fill).	6.0
0	2 3 3 2	SS05					Same as above.	8.0
0	6 6 6 4	SS06					Similar to above except, moist.	10.0
0	2 1 1 2	SS07		10			Very Loose, Olive Gray, fine SAND w/ trace organics, wet, well graded, SW.	12.0
2.7	5 8 14 13	SS08					Top 0.8 Same as above. Bottom 1.2 Medium dense, Olive Gray, coarse SAND w/ few gravel, wet, well graded, Fe staining, WT at 12.5, SW.	14.0
0.6	4 6	SS09					Top 0.3 Same as above (Bottom). Bottom 0.3 Medium dense, Dark olive Gray, fine SAND w/ little fines, wet, well graded, SM.	15.0
1.7	7 6 6 7	SS10		15			Medium dense, Light olive Gray, Coarse SAND, wet, well graded, SW.	17.0
0.6	20 8 8 8	SS11					Similar to above except, few gravel, subround.	19.0
0	9 10	SS12					Same as above.	20.0
0	9 7 9 10	SS13		20			Same as above.	22.0
816		SS14					Similar to above except, trace fines, sheen, odor.	24.0
839	22 15 7 7	SS15		25			Similar to above except, product blebs, sheen.	26.0
72		SS16					Medium dense, Light olive Gray, SILT w/ few gravel, trace fine sand, wet, well graded, subangular, (Till).	28.0

WELL DIAGRAM

- Portland / Volclay Grout
- Bentonite Seal
- #0 Filter Sand
- .010 Slot 2" PVC Schd 40 Screen
- 1' 2" PVC Schd 40 Sump

BORING_WELL POL ... HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	LSSC-08
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	12/17/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	983.60	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	983.26	**DEPTH TO WATER**	
LOGGED BY	NSB	**GROUND WATER ELEVATION**	
NORTHING	532406.3035	**EASTING**	130816.3352

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0		SS01					Loose, Dark yellowish Brown, SAND w/ few gravel, dry, well gradded, SW-GW (fill).	1.0
0	4 6 4 6	SS02					Top 0.8 Loose, Dark yellowish Brown, SAND w/ coal fragments, dry, well graded, SW. Bottom 0.4 Light Brown and White, SAND and COAL ASH, dry, well graded, SW, (Fill).	3.0
0	2 1 2 2	SS03					Loose, White and Grayish Red, fine to medium COAL ASH, moist, well graded, SW, (Fill).	5.0
0	2 1	SS04		5			Similar to above w/ Dark yellowish Brown, SAND w/ few organics.	6.0
1	2 2 1 2	SS05					Top 0.4 Same as above. Bottom 0.2 Loose, Light olive Brown, SAND, dry, well graded, SW.	8.0
1.7	2 4 2 4 5	SS06					Loose, Light to Moderate olive Brown, interbedded SAND and SILT w/ little organics, dry, poorly graded, SM.	10.0
1.3	3 3 2 3	SS07		10			Top 0.6 Same as above. Bottom 0.7 Loose, Light olive Gray, SILT w/ some interbedded sand, moist, poorly graded, SM.	12.0
4	3 3 4 4	SS08					Same as above	14.0
6.1	2 1 3	SS09					Top 0.5 Similar to above except, moist. Bottom 0.3 Wood Core	15.0
1	2 3 4	SS10		15			Wood Core	17.0
0	2 2 1 2	SS11					Top 0.3 Wood Core. Bottom 0.7 Very loose, Olive Gray to Light Brown, GRAVEL w/ little sand, wet, well graded, subround, GW.	19.0
0	4 4 6	SS12					Similar to above (Bottom) except, trace fines.	20.0
18.7	4 7 5	SS13		20			Top 0.4 Loose, Olive Gray, coarse SAND w/ few gravel, wet, well graded, sheen, SW-GW, Bottom 0.2 Moderate olive Gray, SILT and GRAVEL, wet, well graded, GM.	22.0
224	4 3	SS14					Top 0.6 Same as above (Top). Bottom 0.6 Light olive Gray, SILT, wet, well graded, ML.	
247	4 6	SS15						24.0

WELL DIAGRAM

- Portland / Volclay Grout
- Bentonite Seal
- #0 Filter Sand
- .010 Slot 2" PVC Schd 40 Screen
- 1' 2" PVC Schd 40 Sump

BORING_WELL P...PJ HSI_MA.GDT 2/5/99

HSI GEOTRANS
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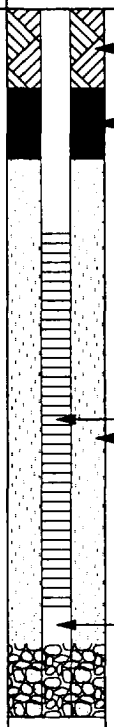
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001
PROJECT NAME Source Control Upper Reach Housatonic River
LOCATION Pittsfield, Massachusetts
DRILLING METHOD HSA
SAMPLING METHOD SS
GROUND ELEVATION 983.35
TOP OF CASING 985.19
LOGGED BY NSB
NORTHING 532560.279

BORING/WELL NUMBER LSSC-09
DATE DRILLED 12/16/98
CASING TYPE/DIAMETER 2" PVC
SCREEN TYPE/SLOT .010 Slot 2" PVC
GRAVEL PACK TYPE #0 Silica Sand
GROUT TYPE/QUANTITY Portland/Volclay
DEPTH TO WATER
GROUND WATER ELEVATION
EASTING 130968.4217

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
4		SS01					Loose, Pale yellowish Brown, SAND w/ few gravel, dry, well graded, SW (fill).	1.0
7	11 7 1 6	SS02					Top 0.4 Same as above. Bottom 0.4 Loose, Brownish Gray to Olive Gray, SAND, dry, well graded, SW (fill).	3.0
N/A	12 12 10 7	SS03					No Recovery.	5.0
25	4 7	SS04		5			Loose, Grayish Brown, SAND w/ silver paper, dry, well graded, SW, (Fill).	6.0
4	1 2 7 5	SS05					Top 0.4 Same as above. Middle 0.4 Loose, Moderate yellow Brown, SAND, dry well graded, SW. Bottom 0.4 Similar to above Dark yellowish Brown w/ little fines.	8.0
4	4 4 5 4	SS06					Loose, Interbedded Olive Gray and Light olive Gray, medium-fine SAND w/ few silt, trace silver paper fragments, dry, poorly graded, SM, (Fill).	10.0
5	4 3 2 2	SS07		10			Similar to above except, some silt, few medium sand, trace organics, WT at 12'.	12.0
3	1 4 4 3	SS08					Similar to above except, trace coal fragments.	14.0
N/A	3 3	SS09					No Recovery.	15.0
20	2 2 12 8	SS10		15			Top 0.4 Loose, Olive Gray, GRAVEL w/ few sand, wet, well graded, GW. Bottom 0.2 Loose, Light olive Brown, SILT w/ little gravel, wet, well graded, ML.	17.0
7	8 7	SS11					Same as above (Bottom).	19.0

WELL DIAGRAM



BORING_WELL PC J HSI_MA GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	LSSC-10
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	12/28/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	985.33	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	987.18	**DEPTH TO WATER**	
LOGGED BY	NSB	**GROUND WATER ELEVATION**	
NORTHING	532799.4741	**EASTING**	130801.2163

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
1.8		SS01					Loose, Moderate olive Brown, SAND w/ few gravel, dry, well graded, SW.	1.0	
0	3 4 3 6	SS02					Loose, Moderate olive Brown, SAND w/ little gravel, dry, well graded, SW.	3.0	
0	5 8 10 8	SS03					Top 0.7 Same as above. Bottom 0.7 Medium dense, Light olive Gray, coarse SAND w/ few gravel, dry, well graded, SW.	5.0	
0	11 12	SS04		5			Same as above.	6.0	
7.1	9 5 7 9	SS05					Top 0.5 Same as above. Middle 0.8 Medium dense, Light olive Gray, SAND, dry, well graded, laminated, SW. Bottom 0.2 Medium dense, Light olive Gray, coarse SAND and GRAVEL, dry, well graded, SW-GW.	8.0	
0	8 5 5 7	SS06					Top 0.6 Same as above (Bottom). Bottom 0.8 Light olive Gray, coarse SAND, dry, well graded, SW.	10.0	
0	6 6 4 5	SS07		10			Similar to above (Bottom) except, moist.	12.0	
0	7 3 3 3	SS08					Loose, Olive Gray, medium to coarse SAND, wet, well graded, SW.	14.0	
10.1	5 6	SS09					Similar to above except, few gravel.	15.0	
0.3	6 6 8 8	SS10		15			Medium dense, Olive Gray, coarse SAND w/ little gravel, wet, well graded, SW	17.0	
0	17 13 9 7	SS11					Top 0.6 Same as above. Bottom 0.2 Medium dense, Light olive Brown, SILT w/ little fine sand, wet, well graded, ML.	19.0	
0	32 10	SS12					Same as above.	20.0	
0	11 11 16 19	SS13		20			Similar to above except, little gravel, subangular.	22.0	
0	15 14 14 12	SS14					Similar to above except, few gravel, subangular, (Till).	24.0	
N/A	18 12 18 12	SS15		25			No Recovery.	26.0	
0	18 12 27 25	SS16					Same as above (22' to 24').	28.0	
0	32 31 27 23	SS17					Dense, Light olive Brown, SILT and GRAVEL, moist, well graded, subangular to angular, (Till).	30.0	
0	21 19 11 14	SS18		30			Top 1.3 Same as above. Bottom 0.2 Dense, Dark yellowish Orange, fine to medium SAND w/ some silt, wet, well graded, SM.	32.0	
0	14 18 25 28	SS19					Similar to above (Bottom) except, trace gravel.	34.0	
0	44 28 33	SS20		35			Similar to above except, weathered limestone fragments.	36.0	

Continued Next Page

Portland / Volclay Grout

Bentonite Seal

BORING_WELL P00... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** LSSC-10

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 12/28/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0	24 87 72/0.2 29	SS21					Dense, Moderate yellowish Brown, SILT w/ some gravel, few fine sand, wet, well graded, subangular, ML.	38.0	#0 Filter Sand .010 Slot 2" PVC Schd 40 Screen
0	52 36 41 73 76 55	SS22		40			Very dense, Moderate yellowish Brown to Moderate olive Brown, SILT w/ some gravel, few fine sand, moist, well graded, subangular, ML, (Till).	40.0	1' 2" PVC Schd 40 Sump

BORING_WELL P00... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	LSSC-11
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	12/29/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	983.97	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	None	**DEPTH TO WATER**	
LOGGED BY	NSB	**GROUND WATER ELEVATION**	
NORTHING	532467.4998	**EASTING**	130849.6207

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		SS01					Loose, Moderate olive Brown, SAND w/ little gravel, dry, well graded, SW (fill).	1.0	
0	12 15 14 9	SS02					Medium dense, Moderate olive Brown, SAND w/ little gravel, trace coal fragments, dry, well graded, SW, (Fill).	3.0	
0	5 6 7 6	SS03					Medium dense, Grayish Black to Black, COAL ASH, dry, well graded, SW, (Fill).	5.0	
0	5 5	SS04		5			Medium dense, Olive Gray, SAND w/ little gravel, dry, well graded, SW, (Fill).	6.0	
0	6 7 7 7	SS05					*Similar to above except, trace silt.*	8.0	
0	6 5 4 6	SS06					Loose, Light olive Gray and Light olive Brown, SAND w/ little silt, dry, well graded, SW.	10.0	
0	3 4 4 4	SS07		10			Similar to above except, laminated (0.3 mm).	12.0	
1.1	5 4 4 4	SS08					Loose, Light olive Gray, SAND w/ little silt, dry, well graded, laminated (0.3 mm), SW.	14.0	
0	8 2	SS09					Similar to above except, medium SAND.	15.0	
111	2 3 13 11	SS10		15			Medium dense, Dark Gray, medium to coarse SAND w/ few gravel, wet, well graded, sheen, SW.	17.0	
8.6	5 6 4 5	SS11					Similar to above except, little gravel.	19.0	
1.1	5 4	SS12		20			Top 0.6 Same as above. Bottom 0.2 Loose, Light olive Gray, SILT, wet, well graded, ML.	20.0	
0	25 10 12 14	SS13					Medium dense, light olive Gray to Moderate olive Brown, SILT w/ some gravel, wet, well graded, subangular, ML, (Till).	24.0	
0	26 16 15 18	SS14		25			Similar to above except, Dense.	26.0	
0	16 18 22 32	SS15					Same as above.	28.0	
0	26 36 29 31	SS16					Similar to above except, Very dense, little fine sand.	30.0	Portland / Volclay Grout
0	61 50 51 32	SS17		30			Similar to above except, Dusky Yellow, weathered limestone fragments.	32.0	
0	52 59 49 43	SS18					Very dense, Moderate olive Brown, SILT w/ few GRAVEL, little fine sand, wet, well graded, subangular, SW, (Till).	34.0	
0	51 17 11	SS19		35			Same as above.	36.0	

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BORING_WELL P009-... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** LSSC-11

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 12/29/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0	9 22 12 11	SS20					Medium dense, Moderate olive Brown, SILT w/ little gravel, wet, well graded, ML.	38.0	
1	9 33 22 29	SS21					Top 0.3 Dense, Light Brown, SAND w/ little gravel, wet, well graded, SW. Bottom 0.4 Dense, Moderate olive Brown, SILT w/ little gravel and fine sand, wet, well graded, subangular, SW, (Till).	40.0	
1.3	31 31 35 59	SS22		40			Similar to above (Bottom) except, trace fine sand.	42.0	
1	40 42 56 75/0.5	SS23					Same as above.	44.0	
1	107 107/0.4	SS24		45			Same as above.	46.0	
0.6	44 59 66 100/0.4	SS25					Same as above.	48.0	
0.6	41 66 113	SS26					Same as above.	50.0	
0.6	58 82 95 99	SS27		50			Similar to above except, little sand.	52.0	
2	182	SS28					Same as above.	54.0	
2.3	147	SS29		55			Same as above.	56.0	
1	113 110/0.2	SS30					Same as above.	58.0	
0.6	53 150	SS31					Same as above.	60.0	
				60					

BORING_WELL P009.ارب HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	N2SC-01I
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	10/29/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	983.60	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	984.99	**DEPTH TO WATER**	
LOGGED BY	MJJ	**GROUND WATER ELEVATION**	
NORTHING	532583.13	**EASTING**	131668.56

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.2	3 11	SS01					Medium Dense, Dusky Brown, SAND w/ some organics few gravel, dry, well graded, (SW), (Fill).	1.0	
0.4	11 9 10 9	SS02					Similar to above except slag and iron fillings.	3.0	
0.4	9 8 6 8	SS03					Medium dense, ,Moderate dark Grey, SAND w/ trace intrebedded silt, dry, poorly graded, iron fillings, (SP), (Fill).	5.0	
0.4	5 2	SS04		5			Same as above.	6.0	
18	2 3 5 6	SS05					Loose, Moderate dark Grey - Dusky Brown, SAND w/ little organics (wood fragments) cement, moist, well graded, (SW), (Fill).	8.0	
14	4 5 6 6	SS06					Medium dense, Moderate olive Brown - Moderate dark Grey, sandy GRAVEL w/ coal fragments, moist, well graded, (GW-SW), (Fill).	10.0	
240	2 2 1 1	SS07		10			Top 1.0 loose, black, sandy GRAVEL, wet, well graded, visible product, (GW-SW), Fill. Bottom 0.4 Black, organic peat, moist, peat stained black roots ect. (PT).	12.0	Portland / Volclay Grout
180	3 4 6 6	SS08					Top 0.8 Same as above (Bottom), Bottom 0.6 loose, Moderate reddish Brown, peat, stained heavily, (PT).	14.0	
66	2 8	SS09					Top 0.3 Loose, Dark reddish Brown, fine - coarse SAND w/ some organics, moist, graded, (SW - PT). Bottom 0.7 Loose, Black, organics (decayed wood), moist, septic odor, (PT).	15.0	
7.4	9 12 18 47	SS10		15			Wood core	17.0	
60	16 16 15 12	SS11					Dense, Moderate olive Brown, coarse - fine SAND w/ some organics, wet, well graded, (SW).	19.0	
66	16 12	SS12					Wood core	20.0	
48	3 3 4 5	SS13		20			Loose, Light olive Brown, sandy SILT, wet, poorly graded, laminated, (ML-SP).	22.0	
N/A	5 6 7 10	SS14					Medium dense, Light olive Brown, silty fine SAND w/ few clay, wet, poorly graded, finely laminated, (SP-SM).	24.0	
6	10 8 8 6	SS15		25			Medium dense, Light - Moderate olive Brown, sandy GRAVEL, wet, well graded, sub-round, (GW-SW).	26.0	Bentonite Seal
6.8	10 8 8 6	SS16					Medium dense, Olive Grey, gravelly SAND, wet, well graded, sub-round, (SW-GW).	28.0	
8.2	7 11 12 12	SS17					Medium dense, Light olive Brown, silty fine SAND, wet, poorly graded, (SP-SM).	30.0	
4.4	12 11 10 11	SS18		30			Medium dense, Olive Grey, coarse SAND w/ some gravel, wet, well graded, sub-round, (SW-GW).	32.0	.010 Slot 2" PVC Schd 40 Screen #0 Filter Sand
N/A	12 13 12 11	SS19					No Recovery / No Sample.	34.0	
78	10 8 8	SS20		35			Medium dense, Light - Moderate olive Brown, sandy GRAVEL trace fines, wet, well graded, sub-round, sheen	36.0	

Continued Next Page

BORING_WELL P009_... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** N2SC-01I

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 10/29/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
110	10 12 4 5	SS21					and staining, (GW-SW). Similar to above except visible product.		1' 2" PVC Schd 40 Sump Bentonite Seal
								38.0	
4.6	6	SS22					Light olive Brown, silty SAND w/ some gravel, (SW-GW), (Till).		
				40				40.0	

BORING_WELL P009-001 HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	N2SC-01S
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	11/3/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	983.51	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	985.1	**DEPTH TO WATER**	
LOGGED BY	MJJ	**GROUND WATER ELEVATION**	
NORTHING	532580.43	**EASTING**	131670.28

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
				5			See Log of N2SC-01I	19.0	Portland / Volclay Grout Bentonite Seal #0 Filter Sand .010 Slot 2" PVC Schd 40 Screen
				10					
				15					
				20					

BORING_WELL PU... .PJ HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001
PROJECT NAME Source Control Upper Reach Housatonic River
LOCATION Pittsfield, Massachusetts
DRILLING METHOD HSA
SAMPLING METHOD SS
GROUND ELEVATION 983.28
TOP OF CASING 985.07
LOGGED BY MJJ
NORTHING 532594.56

BORING/WELL NUMBER N2SC-02
DATE DRILLED 11/3/98
CASING TYPE/DIAMETER 2" PVC
SCREEN TYPE/SLOT .010 Slot 2" PVC
GRAVEL PACK TYPE #0 Silica Sand
GROUT TYPE/QUANTITY Portland/Volclay
DEPTH TO WATER
GROUND WATER ELEVATION
EASTING 131592.76

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0	2 4	SS01					Loose, Light to Moderate Brown, fine SAND w/ some organics (leaves, sticks, roots), dry, well graded, (SW), (Fill).	1.0
17	7 7 2 1	SS02					Top 1.1 Same as above. Bottom loose, Moderate Grey, fine SAND, moist, poorly graded, (SP), (Fill).	3.0
66	8 7 5 6	SS03					Same as above (Bottom).	5.0
55	9 17	SS04		5			Medium Dense, Moderate olive Brown to Moderate Brown, SAND w/ few gravel brick fragments, dry, well graded, sub-angular, (SW), (Fill).	6.0
30	8 6 6 8	SS05					Medium dense, Light Brown, fine SAND w/ trace gravel, dry, graded, (SW-SP), (Fill).	8.0
5	2 3 5 6	SS06					Top 1.0 loose, Olive Grey, fine SAND w/ some organics, dry, graded, (SP), (Fill). Bottom 0.3 loose, Moderate Brown, fine SAND, moist, poorly graded, (SP).	10.0
16	2 1 3 4	SS07		10			Loose, Greyish Olive, fine SAND w/ few organics, wet (at 11.2), poorly graded, (SP).	12.0
15	3 3 2 5	SS08					Similar to above except bottom 0.2 few gravel, (SP-SW).	14.0
28	2 5	SS09					Medium dense, Olive Grey, coarse SAND w/ some gravel, wet, well graded, (SW-GW).	15.0
65	6 6 7 5	SS10		15			Same as above.	17.0
68	10 10 7 7	SS11					Same as above.	19.0
30	4 4 3 2	SS12		20			Loose, Moderate olive Brown, medium SAND w/ some gravel, trace fines, wet, well graded, (SW-GW).	21.0
28	4 4 4 7	SS13					Similar to above except graded bed 0.8 thick.	23.0
18	7 6	SS14					Loose, Moderate olive Brown, coarse SAND and GRAVEL w/ trace fines, wet, well graded, sub-round, (GW-SW).	24.0
100	3 4 2 3	SS15		25			Loose, Light to Moderate olive Brown, sandy GRAVEL w/ trace fines, wet, well graded, sub-angular, (GW-SW).	26.0
40	4 6 5 7	SS16					Similar to above except bottom 0.3 few fines.	28.0
40	10 13 4 16	SS17					Medium dense, Light olive Brown, sandy GRAVEL w/ few fines, wet, well graded, sub-round to round, (GW-SW) , outwash.	30.0
18	12 12 14 13	SS18		30			Medium dense, Light olive Brown, sandy GRAVEL w/ little silt, wet, well graded, sub-angular, (GW-SW).	32.0
350	11 9 11 11	SS19					Top 0.6 Same as above. Bottom 0.4 similar to above except stained, sheen on spoon and cobbles black.	34.0
400	8 7 13	SS20		35			Material same as above staining reddish brown.	36.0

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WELL DIAGRAM

- Portland / Volclay Grout
- Bentonite Seal
- #0 Filter Sand
- .010 Slot 2" PVC Schd 40 Screen

BORING_WELL P0u... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** N2SC-02

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 11/3/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
460	11 13 14 5 8 8 10	SS21					Top 0.2 Same as above. Bottom 1.6 Light olive Brown, sandy SILT w/ few gravel, few clay, wet, well graded, (ML), (sand stringer 37.0-37.2), (Till).	38.0	1' 2" PVC Schd 40 Sump

BORING_WELL P0... .J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	N2SC-03I
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	11/2/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	983.53	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	985.33	**DEPTH TO WATER**	
LOGGED BY	MJJ	**GROUND WATER ELEVATION**	
NORTHING	532536.68	**EASTING**	131579.89

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.4	2 5	SS01					Loose, Pale Brown, SAND w/ some organics, few gravel, dry, well graded, (SP), (Fill).	1.0	
7.2	9 11 11 13	SS02					Medium dense, Yellowish Orange to Moderate dark Brown, SAND w/ ceramic and coal fragments, dry, well graded, (SP), (Fill).	3.0	
6.8	10 6 6 6	SS03					Medium dense, Grey, wood and paper fragments, (Fill).	5.0	
10.2	5 5	SS04		5			Medium dense, Moderate Brown, SAND w/ few gravel, little organics, moist, well graded, (SP), (Fill).	6.0	
5.8	5 4 7 10	SS05					Medium dense, Moderate to Dark Brown, SAND w/ little gravel, few ceramic fragments, moist, well graded, (SW), (Fill).	8.0	
9	1 5 19 21	SS06					Medium dense, Moderate to Dark Brown, SAND w/ some silt, wood and brick fragments, (SW), (Fill).	10.0	
150	8 5 3 2	SS07		10			Loose, Black, SAND w/ some gravel, copper wire, wet, well graded, sheen present, (SW), (Fill).	12.0	Portland / Volclay Grout
150	2 2 2 3	SS08					Loose, Black, organic peat (roots sticks fiberous), wet, (PT).	14.0	
200	2 1 2	SS09					Same as above, septic odor.	15.0	
100	1 1 1 2	SS10		15			Same as above.	17.0	
140	2 2 5 5 3	SS11					Top 1.1 Same as above, (Fill). Bottom 0.2 loose, Greyish Olive, medium SAND w/ trace gravel, wet, poorly graded, (SP).	19.0	
110	5 5	SS12					Loose, Greyish Olive to Olive Grey, medium - coarse SAND, wet, graded, (SP-SW).	20.0	
180	1 4 4 3	SS13		20					
42	3 3 3 3	SS14					Loose, Olive Grey, medium - coarse SAND w/ few gravel, trace fines, wet, well graded, sub-round, (SW).	24.0	Bentonite Seal
84	2 2 3 4	SS15		25			Loose, Light olive Grey, medium - fine SAND, wet, gradded, sheen, (SW).	26.0	
162	6 7 10 8	SS16					Top 0.6 Same as above. Bottom 0.8 medium dense, Moderate olive Brown, SAND w/ few silt, wet, graded, fining downward, (SP)	28.0	
92	3 7 7 8	SS17					Same as above (Bottom).	30.0	
158	6 11 9 14	SS18		30			Medium dense, Light olive Brown, medium - fine SAND, wet, porly graded,(SP).	32.0	#0 Filter Sand .010 Slot 2" PVC Schd 40 Screen
26	16 16 32 31	SS19					Top 0.8 Same as above. Bottom 0.2 dense, Light olive Brown, sandy GRAVEL w/ few fines, wet, well graded, sub-round, (GW-SW).	34.0	
140		SS20		35			Similar to above, except faint staining in top gravel zone, bottom is coarse gravel.	36.0	

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HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** N2SC-03I

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 11/2/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
38		SS21					Light olive Brown, silty SAND w/ few gravel, wet, well graded, sub-angular, (SW), (TILL).	38.0	1' 2" PVC Schd 40 Sump

BORING_WELL P009-... HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	N2SC-03S
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	11/3/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	983.68	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	985.18	**DEPTH TO WATER**	
LOGGED BY	MJJ	**GROUND WATER ELEVATION**	
NORTHING	532540.96	**EASTING**	131575.8

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
				5			See Boring Log N2SC-03I	20.0	Portland / Volclay Grout Bentonite Seal #0 Filter Sand .010 Slot 2" PVC Schd 40 Screen
				10					
				15					
				20					

BORING_WELL P00... HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	N2SC-04
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	11/4/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	979.87	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	981.56	**DEPTH TO WATER**	
LOGGED BY	MJJ	**GROUND WATER ELEVATION**	
NORTHING	532633.7	**EASTING**	131434.39

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
1.6	1 5	SS01					Top 0.4 loose, Moderate to Dark Brown, SAND w/ some organics, (SW). Bottom 0.6 loose, Olive Brown, SAND w/ little gravel, dry, well graded, sub-angular, (SW).	1.0
0.2	3 4 4 4	SS02					Loose, Dusky Yellow to Moderate Brown, SAND w/ fill debris (coal slag), dry, well graded, (SW), (Fill).	3.0
5.2	4 3 4 4	SS03					Loose, Light to Moderate olive Brown, fine SAND w/ few organics(stained orange), dry, graded, (SP), (Fill).	5.0
N/A	2 1	SS04		5			Same as above.	6.0
26	2 2 2 2	SS05					Loose, Moderate olive Brown, fine SAND w/ few silt, moist, poorly graded, (SP).	8.0
22	2 3 2 3	SS06					Top 0.3 Same as above. Bottom 1.1 loose, Light olive Brown, medium to coarse SAND, wet (at 9.5), graded, oxide staining, (SW).	10.0
7.2	2 3 4 4	SS07		10			Loose, Light olive Brown, medium to coarse SAND, wet, well graded, sub-round, (SW).	12.0
3	2 1 1 1	SS08					Top 0.2 loose, Moderate olive Brown, fine SAND w/ some silt, wet, poorly graded, laminated, (SP). Bottom 1.1 loose, Light to Moderate Olive, medium to coarse SAND w/ some gravel, wet, well graded, sub-angular, (SW).	14.0
30		SS09					Top 0.1 Same as above (Bottom). Middle 0.1 wood chunk. Bottom 0.1 Loose, Moderate olive Brown, coarse SAND, wet, well graded, (SW).	15.0
1.2	2 2 2 3	SS10		15			Loose, Moderate olive Brown, SAND w/ few gravel, trace fines, wet, well graded, sub-round, (SW).	17.0
0.8	2 3 4 4	SS11					Same as above.	19.0
8	7 7	SS12					Similar to above except for wood fragment in tip.	20.0
40	5 8 6 9	SS13		20			*Medium dense, Light to Moderate olive Brown, medium to* coarse SAND w/ few gravel, trace fines, wet, well graded, sub-round, (SW).	22.0
0	10 12 12 13	SS14					Medium dense, light to moderate olive brown, sandy GRAVEL few fines, wet, well graded, SW, subangular, bedding sequence apx. 0.5' thick.	24.0
6.6	6 27 18 18	SS15		25			Similar to above except some cobbles.	26.0
13.2	20 9 6 13	SS16					Same as above.	28.0
5.6	3 3 10 13	SS17		30			Medium dense, Light olive Brown, silty SAND w/ little gravel, few clay, wet, well graded, (SW), (Till).	30.0

WELL DIAGRAM

BORING_WELL P00...J HSI_MA.GDT 2/5/99

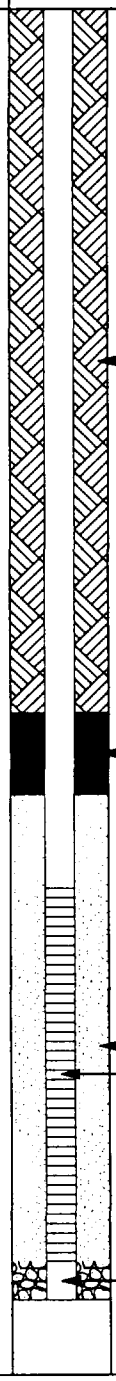
HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	N2SC-05
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	11/3/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	980.65	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	982.64	**DEPTH TO WATER**	
LOGGED BY	MJJ	**GROUND WATER ELEVATION**	
NORTHING	532682.15	**EASTING**	131490.07

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
1	1 2	SS01					Loose, Light olive Grey, fine SAND w/ organics, dry, well graded, (SP), (Fill).	1.0
0.6	4 2 4 4	SS02					Top 0.3 Loose, Light to Moderate Grey, fine SAND w/ organics, dry, poorly graded, (SP). Bottom 0.6 loose, Light to Moderate Brown, fine SAND, (SP), (Fill).	3.0
1.2	5 5 3 2	SS03					Top 0.6 Same as above (Bottom). Bottom 0.8 loose, Black, sandy, GRAVEL coal fragments, ceramics, dry, well graded, (GW), (Fill).	5.0
0.1	1 2	SS04		5			Loose, Light to Moderate olive Brown and Black, interbedded SAND w/ coal and organic fragments, moist, well graded, (SW).	6.0
1.2	1 2 3 3	SS05					Loose, Greyish Olive, sandy SILT w/ few organics (roots, sticks), moist, graded, (ML-SW).	8.0
0	0 1 2 2	SS06					Loose, Greyish Olive, SILT w/ little clay, few organics, fine sand stringers, moist, poorly graded, (CL).	10.0
0.8	1 1 2 2	SS07		10			Top 1.4 loose, interbedded Olive Grey and Moderate Brown, SAND and peat, wet, laminated, (SW - PT). Bottom 0.4 wood core.	12.0
2.4	2 3 6 6	SS08					Top 0.8 wood core. Bottom 0.8 loose, Olive Grey, medium to coarse SAND w/ trace fines, wet, well graded, sub-angular, (SW).	14.0
3.8	3 4 4 4	SS09					Loose, Olive Grey, sandy GRAVEL w/ trace fines, wet, well graded, sub-angular, (GW-SW).	15.0
15.2	1 2 5 4	SS10		15			Top 0.6 Same as above. Bottom 0.2 loose, Moderate olive Brown, SILT and fine SAND, wet, well graded, (ML-SW).	17.0
10.4	5 3 4 2	SS11					Loose, Light to Moderate olive Brown, interbedded SILTS and GRAVEL, wet, well graded, sub-angular, (ML-GW).	19.0
54	4 4 4 4	SS12					Same as above.	20.0
N/A	4 5 6 6 7	SS13		20			Loose, Olive Grey, SAND w/ some gravel, trace fines, wet, well graded, sub-angular, (SW-GW).	22.0
4		SS14					Similar to above except sandy GRAVEL, (GW-SW).	24.0
4.8		SS15		25			Similar to above except Light olive Brown.	26.0
3.6		SS16					Similar to above except few interbedded silt stringers.	28.0
4		SS17					Olive gray to light olive brown, sandy GRAVEL w/ few fines, wet, well graded, subangular, GW, outwash deposit.	30.0
11.2		SS18		30			Same as above.	32.0
250		SS19					Top 0.8 Same as above. Bottom 0.3 Light olive Brown, sandy SILT, wet, poorly graded, sheen, (ML-SW).	34.0
64		SS20		35			Light olive Brown, SILT and SAND w/ some gravel, wet, well graded, angular, (SW), (Till).	36.0

WELL DIAGRAM



BORING_WELL P00... J HSI_MA GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001
PROJECT NAME Source Control Upper Reach Housatonic River
LOCATION Pittsfield, Massachusetts
DRILLING METHOD HSA
SAMPLING METHOD SS
GROUND ELEVATION 983.94
TOP OF CASING 985.27
LOGGED BY MJJ
NORTHING 532685.65

BORING/WELL NUMBER N2SC-06
DATE DRILLED 10/28/98
CASING TYPE/DIAMETER 2" PVC
SCREEN TYPE/SLOT .010 Slot 2" PVC
GRAVEL PACK TYPE #0 Silica Sand
GROUT TYPE/QUANTITY Portland/Volclay
DEPTH TO WATER
GROUND WATER ELEVATION
EASTING 131681.15

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0		SS01					Loose, Moderate yellowish Brown, sandy GRAVEL, dry, well graded, sub-rounded, (GW-SW), (Fill).	1.0
0	7 11 11 7	SS02					Medium dense, Moderate yellowish Brown, sandy GRAVEL w/ cement fragments, dry, well graded, sub-angular, (GW-SW), (Fill).	3.0
0.4	10 12 12 8	SS03					Medium dense, Olive Grey, fine SAND w/ little silt, trace gravel, dry, sub-round, faint blackish staining (SW).	5.0
N/A	7 4	SS04		5			No Recovery / No Sample.	6.0
N/A	4 3 4 3	SS05					No Recovery / No Sample.	8.0
1.4	7 7 6 5	SS06					Loose, Olive Grey, SAND w/ some gravel, trace fines, pieces of cardboard, moist, well graded, sub-round, (SW), (Fill).	10.0
11.2	2 1 1 2	SS07		10			Very loose, Olive Grey to Moderate olive Brown, fine SAND w/ some silt, litle organics, moist (wet at tip), graded, (SM).	12.0
	4 3 2 3	SS08					Loose, Olive Grey, fine SAND w/ few gravel, wet graded, sub-round, (SW).	14.0
28		SS09					Medium dense, Olive Grey, fine SAND w/ few interbedded organics, wet, poorly graded, finely laminated, (SP).	15.0
4.6		SS10		15			Top 0.2 Same as above. Bottom 0.4 Dusky Brown, organic peat, moist, well graded, PT.	17.0
12.2	3 4 7 6	SS11					Top 0.4 Same as above (Bottom). Bottom 0.3 Medium dense, Olive Grey, sandy GRAVEL, wet, well graded, angular, (GW-SW).	19.0
14	4 4	SS12					Same as above (Bottom).	20.0
22	4 4 5 5	SS13		20			Loose, Olive Grey, SAND w/ trace gravel, wet, poorly graded, (SP).	22.0
62	6 7 7 6	SS14					Same as above.	24.0
70	3 6 10 13	SS15		25			Medium dense, Olive Grey to Moderate olive Brown, silty SAND w/ little clay, wet, poorly graded, interbedded, (SM).	26.0
44	18 27 18 13	SS16					Dense, Light olive Brown, sandy GRAVEL w/ few silt, wet, well graded, sub-angular, (GW-SW).	28.0
N/A	6 5 4 3	SS17					No Recovery / No Sample.	30.0
38	4 7 8 7	SS18		30			Medium dense, Light olive Brown, sandy GRAVEL w/ trace fines, wet, well graded, sub-angular (GW-SW).	32.0
46	8 5 6 6	SS19					Top 0.5 Same as above (Bottom), Bottom 0.3 Medium dense, Light olive Brown, silty fine SAND, wet, poorly graded, (SP-SM).	34.0
10	13 51	SS20		35			Very dense, Light olive Brown, sandy SILT w/ little gravel, few clay, moist, well graded, sub-angular, (Till).	36.0

WELL DIAGRAM

- Portland / Volclay Grout
- Bentonite Seal
- #0 Filter Sand
- .010 Slot 2" PVC Schd 40 Screen
- 1' 2" PVC Schd 40 Sump
- Bentonite Seal

BORING_WELL PO... ...J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	N2SC-07
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	11/6/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	982.89	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	984.61	**DEPTH TO WATER**	
LOGGED BY	NSB	**GROUND WATER ELEVATION**	
NORTHING	532721.95	**EASTING**	131582.5

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0		SS01					Dense, Olive Brown, SAND w/ some gravel, dry, well graded, angular, (SW-GW), (Fill).	1.0
1.5	6 16 16 7	SS02					Same as above.	3.0
0.3	3 3 2 2	SS03					Loose, Olive Brown, medium SAND w/ some wood fragments, trace gravel, dry, well graded, (SW).	5.0
25	3 3	SS04		5			Similar to above except little wood frags.	6.0
1	4 3 3 3	SS05					Loose, Moderate olive Brown, gravelly coarse SAND, dry, well graded, (SW-GW).	8.0
4.6	2 2 2 2 2	SS06					Top 1.0 Moderatre yellow Brown, medium SAND trace silt, dry, well graded, (SW). Bottom 0.6 loose, Moderate olive Brown, coarse SAND, dry, well graded, (SW).	10.0
0	2 3 3 3 2	SS07		10			Top 0.8 loose, Moderate olive Brown, coarse SAND w/ trace silt, dry, well graded, (SW). Bottom 0.3 Similar except iron staining.	12.0
26	3 3 4 4	SS08					Top 0.2 Same as above (Bottom). Bottom 1.0 loose, Olive Grey, medium to coarse SAND trace gravel, wet, well graded, sub-rounded, (SW).	14.0
42	2 3	SS09					Loose, Olive Grey, medium to coarse SAND some wood fragments, wet, well graded, (SW).	15.0
15	2 2 3 4	SS10		15			Loose, Moderate olive Grey, coarse sandy GRAVEL w/ few wood fragments, wet, well graded, (GW-SW).	17.0
5	7 7 11 8	SS11					Medium dense, Olive Grey, sandy GRAVEL, wet, well graded, (GW-SW).	19.0
N/A	2 5	SS12					No Recovery / No Sample.	20.0
5	3 6 6 10	SS13		20			Medium dense, Moderate to Olive Grey, gravelly SAND w/ trace silt, wet, well graded, sub-rounded, (SW-GW).	22.0
5	7 7 7 9	SS14					Similar to above except middle 0.2 silty sand interval	24.0
N/A	4 6 6 8	SS15		25			Medium dense, Moderate olive Grey, gravelly SAND interbedded w/ fine sand, wet, well graded, sub-angular, (SW-GW).	26.0
3	8 9 8 9	SS16					Same as above.	28.0
60	5 5 7 10	SS17					Medium dense, Moderate olive Grey, SAND w/ little gravel, wet, well graded, sub-angular, (SW).	30.0
340	6 8 9	SS18		30			Similar to above except for sheen.	32.0
600	12 25 14 14	SS19					Top 1.0 Dense, Moderate olive Grey, SAND w/ few gravel, wet, well graded, (SW). Bottom 0.4 Similar to top except coarse SAND and no gravel.	34.0
650/150	11 14 17	SS20		35			Top 0.6 Same as above (Bottom). Bottom 0.6 Dense,Light to Moderate olive Brown, sandy SILT w/ some gravel, wet,	36.0

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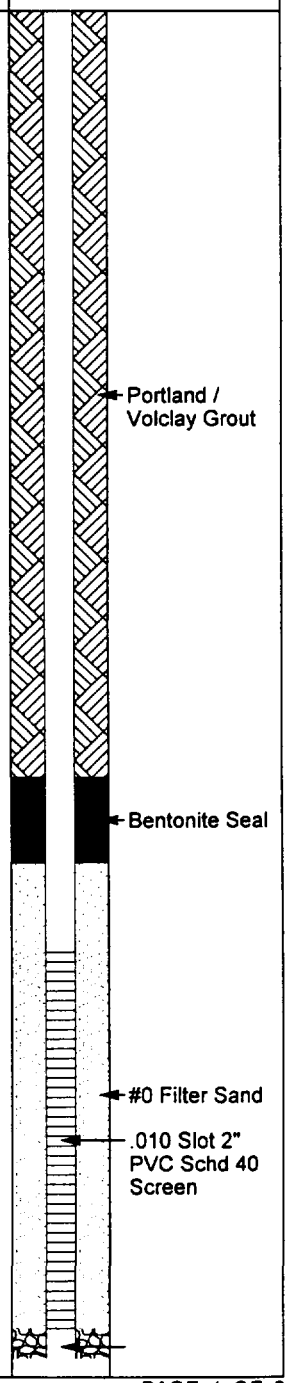

BORING_WELL PL... .PJ HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** N2SC-07

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 11/6/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
	19						well graded, sub-angular, (ML), (Till). Head space top 650 bottom 150.		1' 2" PVC Schd 40 Sump

BORING_WELL Po... .J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001
PROJECT NAME Source Control Upper Reach Housatonic River
LOCATION Pittsfield, Massachusetts
DRILLING METHOD HSA
SAMPLING METHOD SS
GROUND ELEVATION 986.42
TOP OF CASING 988.36
LOGGED BY MJJ
NORTHING 533580.48

BORING/WELL NUMBER E2SC-01
DATE DRILLED 10/14/98
CASING TYPE/DIAMETER 2" PVC
SCREEN TYPE/SLOT .010 Slot 2" PVC
GRAVEL PACK TYPE #0 Silica Sand
GROUT TYPE/QUANTITY Portland/Volclay
DEPTH TO WATER
GROUND WATER ELEVATION
EASTING 133469.53

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
1.2	6 12	SS01					Medium dense, Moderate Brown, SAND w/ little organics, trace gravel, moist, well graded (SW-Pt) (soil horizon).	1.0
0.1	6 6 8 7	SS02					Medium dense, Moderate Brown, fine SAND w/ little gravel, moist, well graded, (SW) (poor recovery).	3.0
1.2	6 5 7 8	SS03					Medium dense, Moderate olive Brown, SAND w/ little gravel, few fines, moist, well graded, (SW).	5.0
1	4 7	SS04		5			Same as above.	6.0
1	2 1 3 3	SS05					Loose, Light to Moderate yellowish Brown, fine SAND w/ little silt, moist, poorly graded, orange mottling, (SP).	8.0
0	4 3 6 6	SS06					Same as above	10.0
0	7 5 7 5	SS07		10			Top 1.2, Same as above. Bottom 0.5', Medium dense, Light olive Brown, fine to medium SAND w/ little silt, moist , poorly graded, laminated (SP).	12.0
0.6	5 8 7 8	SS08					Medium dense, Light Grey to Medium Brown, Interbeded fine SAND and organic peat w/ little silt, moist (SP-Pt).	14.0
12	25 7	SS09					Same as above	15.0
11	3 3 3 5	SS10		15			Loose, Light to Moderate Grey, interbeded fine SAND w/organics, wet, well graded, (SP-Pt) (soil horizon).	17.0
25	3 4 5 8	SS11					Same as above	19.0
3	2 3	SS12					Same as above	20.0
2	4 6 6 9	SS13		20			Same as above	22.0
1	6 9 11 12	SS14					Same as above	24.0
2.5	19 11 12 10	SS15		25			Medium dence, Brownish Black, medium SAND, wet, well graded, SW, stained.	26.0
2	4 6 11 9	SS16					Similar too above except, little fines, few gravel	28.0
3.1	12 12 11 10	SS17					Similar too above except, trace gravel	30.0
0.6	19 12 11 11	SS18		30			Top 1.0, Same as above. Bottom .4, Medium dense, Light to Moderate olive Brown, GRAVEL w/ little sand, few silt, wet, well graded, sub-angular (GW).	32.0
2	14 14 9 10	SS19					Medium dense, Light olive, sandy GRAVEL w/ few fines, wet, well graded, sub-round, (GW).	34.0
N/A	9 10 15	SS20		35			Medium dense, Grayish Olive, gravelly SAND w/trace silt, wet, well graded, sub round, Quartz cobbles, (SW-GW).	36.0

Continued Next Page

WELL DIAGRAM

- Portland / Volclay Grout
- Bentonite Seal
- #0 Filter Sand

BORING_WELL P0[illegible] HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** E2SC-01

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 10/14/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
	16 10 17 17	SS21					No recovery/ no sample (sluff in spoon has sheen headspace 5.6).	38.0	.010 Slot 2" PVC Schd 40 Screen
63.2	22 24 11 11	SS22					Medium dense, Black, gravelly SAND, wet, well graded, heavilly stained, sheen, laminated fine sand at tip has faint staining, (SW-GW).	40.0	
0	17 4 11 11	SS23		40			Medium dense, Moderate yellowish Brown, fine SAND w/little silt, wet, poorly graded, (SP-SM).	42.0	1' 2" PVC Schd 40 Sump
1	9 4 4 6	SS24					Similar to above except, trace clay, laminated 1-3mm, tip has angular gravel.	44.0	
6	6 8 13 12 11	SS25		45			Medium dense, Light olive Brown, SAND w/ some silt, little gravel, trace clay, wet, well graded, (SW-SM), (Till).	46.0	Bentonite Seal

BORING_WELL P00... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	E2SC-02
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	10/23/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	985.93	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	987.57	**DEPTH TO WATER**	
LOGGED BY	MJJ	**GROUND WATER ELEVATION**	
NORTHING	533574.77	**EASTING**	133343.71

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0	4 6 8 14	SS02					Medium dense, Moderate olive Brown, fine SAND w/ some subangular gravel, few fines, dry, well graded, (SW).	3.0
0.2	6 14 24 8	SS03					Dense, Light - Moderate olive Brown, SAND w/ little subangular gravel, few fines, dry, well graded, (SW).	5.0
2.2	9 4	SS04		5			Same as above	6.0
0.2	2 6 7 14	SS05					Top 1.0 Medium dense, Light olive Brown, clayey SILT w/ wood fragments, dry, poorly graded, (CL- ML). Bottom .3 Medium dense, Moderate olive Brown, medium SAND, moist, poorly graded, SP.	8.0
0	4 4 4 11	SS06					Loose, Olive Grey, medium - fine SAND w/ few fines, trace organics, dry, graded, laminated, (SP), (native).	10.0
0.4	2 2 2 5	SS07		10			Loose, Olive Grey, organic fine SAND w/ trace fines, moist, graded, wood fragments, faint organic odor (SW-SM).	12.0
32	2 4 4 9	SS08					Top 1.4 Similar to above except, Interbedded. Bottom .3 Similar too above except, Loose, wet, petroleum odor, free product, (light yellow).	14.0
56	4 6 4 5	SS09					Loose, Olive Grey, fine SAND w/ little gravel, few organic (wood fragments), wet, faint odor, black staining in finer zones, (SW).	15.0
80		SS10		15				16.0
62	3 4 5 5	SS11					Loose, Moderate olive Brown, SAND w/ little gravel, few fines, wet, well graded, product observed, strong petroleum odor, (SW).	18.0
50	3 5 11 12	SS12					Loose, Moderate olive Brown, gravelly SAND w/ trace fines, wet, well graded, subrounded, oil sheen on spoon, (SW-GW).	20.0
26	14 7 7 7	SS13		20			Medium Dense, Moderate olive Brown, sandy subrounded GRAVEL w/ few fines, wet, well graded, sheen and odor present, (GW).	22.0
46	4 1 4 6	SS14					Medium Dense, Olive Grey, medium - coarse SAND and subrounded GRAVEL w/ few fines, wet, well graded, (SW-GW).	24.0
							No Recovery.	
32	10 10 11 10	SS15		25			Loose, Olive Grey, medium - coarse SAND, w/ some subround gravel little fines, wet, well graded, (SW).	26.0
58	13 12 15 9	SS16					Medium Dense, Olive Grey, gravelly SAND, wet, well graded, subround, (SW-GW).	28.0
62		SS17					Similar to above except, visible NAPL.	30.0
210	18 22 25 19	SS18		30			Medium Dense, Moderate olive Brown - Grey, fine - medium SAND interbedded w/ gravel, wet , poorly sorted, NAPL present in coarser zones (SW-GW).	32.0
180	11 24 24 32	SS19					Dense, Moderate olive Brown - Olive Grey, sandy GRAVEL w/ few fines, wet, well graded, subangular, (GW).	34.0
160	29 29 29	SS20		35			Same as above	36.0

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WELL DIAGRAM

Portland / Volclay Grout

Bentonite Seal

#0 Filter Sand

BORING_WELL POO... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** E2SC-02

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 10/23/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
200	32 25 15 11	SS21					Same as above	38.0	.010 Slot 2" PVC Schd 40 Screen
16	11 9 15 30 69	SS22		40			Top .2 Same as above. Bottom .2 Medium dense, Olive Grey, fine SAND, wet, graded, product sheen on interior of SS, sample, (SW).	40.0	
							Top .9 Medium dense, Light - Moderate olive Brown, SILT w/ fine sand, trace clay, wet, poorly graded, (ML). Bottom .4 Dense, light - Light - Moderate olive Brown, silty fine SAND w/ some gravel few clay, wet, well graded, (CLG), (Till).	42.0	1' 2" PVC Schd 40 Sump

BORING_WELL P009-001 HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	E2SC-03I
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	10/15/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	980.43	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	982.12	**DEPTH TO WATER**	
LOGGED BY	MJJ	**GROUND WATER ELEVATION**	
NORTHING	533473.03	**EASTING**	133392.16

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.2	3 3	SS01					Very loose, Moderate dark Brown, organic SAND, (SW) (topsoil).	1.0
0.2	2 2 2 2 3	SS02					Very loose, Moderate Brown, SAND w/ little gravel, few organics, moist, well graded, faint order, (SW).	3.0
32	5 5 5 4	SS03					Loose, Light-Moderate olive Brown, SAND w/ few gravel, trace fines, moist, well graded, (SW), (Fill) (poor recovery).	5.0
N/A	3 3	SS04		5			No Recovery.	6.0
6.8	5 3 25 35	SS05					Top .3 Loose, Moderate olive Brown, SAND w/ few gravel, trace fines, dry, well graded, (SW). Bottom .4 Medium dense, Black, Coal Ash and slag, dry, well graded, fractured from drive, (Fill).	8.0
28	11 16 9 13	SS06					Medium dense, Black, SAND w/ little gravel, trace fines, few wood fragments, moist to wet, well graded, heavily stained sheen present on soil (w/ NAPL), (SW).	10.0
32	2 2 3 5	SS07		10			Loose, Black, SAND w/ NAPL, sheen on spoon (poor recovery), (FILL).	12.0
38	6 5 4 5	SS08					Black, medium - fine SAND, wet, poorly graded, heavily stained sheen on spoon and sample, (SP).	14.0
10	1 2	SS09					Top .4 Same as above. Bottom .3 Very loose, Olive gray, medium SAND, moist, faint staining, (SW).	15.0
N/A	2 1 3 4	SS10		15			No Recovery.	17.0
13.2	3 3 3 4	SS11					Loose, Light olive Brown, fine SAND, wet, poorly graded, finely laminated, (SP).	19.0
N/A	3 3	SS12					Same as above.	20.0
N/A	4 4 4 3	SS13		20			Loose, Light olive Brown, fine SAND w/ few silt, wet, poorly graded, finely laminated 1-4 mm, (SM).	22.0
N/A	5 4 4 4	SS14					Same as above.	24.0
N/A	4 3 4 8	SS15		25			Same as above (loose).	26.0
N/A	2 1 1 4	SS16					Same as above (poor recovery due to loose material).	28.0
N/A	2 3 4 4	SS17					Same as above, Trace organics in units.	30.0
N/A	2 3 4 5	SS18		30			Loose, Light olive Brown to Light olive Grey, fine SAND w/ trace fines, poorly graded, laminated 1-3mm, (SM).	32.0
N/A	3 4 4 6	SS19					Same as above.	34.0
N/A	3 4 6	SS20		35			Loose, Light olive Brown, fine SAND w/ few silt, wet, poorly graded, loose laminated 1-3 mm, (SP).	36.0

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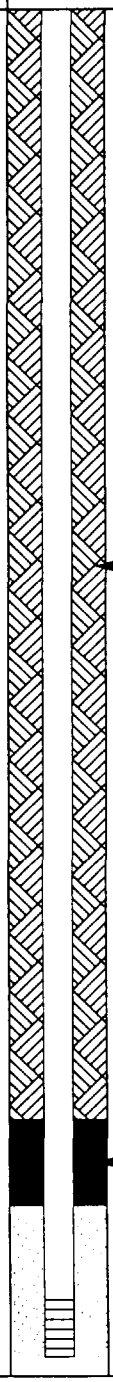
WELL DIAGRAM



HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** E2SC-03I

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 10/15/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
N/A	7 10 4 5	SS21					Same as above.	38.0	
N/A	6 5 2 2	SS22					Loose, Moderate olive Brown, medium - coarse SAND w/ few fines, wet, well graded, subrounded, heavily stained (DNAPL sheen), (SW).	40.0	#0 Filter Sand .010 Slot 2" PVC Schd 40 Screen
N/A	7 14 9 9	SS23		40			Medium dense, Moderate olive Brown, SAND w/ few gravel, trace fines, wet, well graded, heavily stained, NAPL observed in soil, (SW).	42.0	
N/A	16 20 21 28	SS24					Dense, Moderate - Dark Brown, sandy GRAVEL w/ little fines, wet, well graded, subrounded gravel, heavily stained, (GW-SW).	44.0	
6	54 32 98 73	SS25		45			Very dense, Moderate Brown to Moderate olive Brown, gravelly SAND w/ few silt trace clay, moist, well graded, heavily stained (prdt in preferential pathways), (SW-GW).	46.0	1' 2" PVC Schd 40 Sump
0	103 18 17 15 10	SS26					Dense, Light Olive, fine SAND w/ little silt, rafted clasts, well graded, (SM).	47.0	

BORING_WELL POL J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	E2SC-03S
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	10/16/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	980.57	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	982.15	**DEPTH TO WATER**	
LOGGED BY	MJJ	**GROUND WATER ELEVATION**	
NORTHING	533473.43	**EASTING**	133394.88

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
				5 10 15			See Boring Log " E2SC-03I"	20.0	Portland / Volclay Grout Bentonite Seal #0 Filter Sand .010 Slot 2" PVC Schd 40 Screen Cave in

BORING_WELL POL J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	E2SC-04
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	10/13/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	987.29	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	989.11	**DEPTH TO WATER**	
LOGGED BY	MJJ	**GROUND WATER ELEVATION**	
NORTHING	533577.76	**EASTING**	133578.97

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
N/A	4 11	SS01					Loose, Moderate - Dark Brown, organic SAND w/ little fines, moist, well graded, brick fragments, (SW) (FILL).	1.0
0	4 54	SS02					Dense, Light - Moderate olive Brown, SAND w/ little fines, little gravel, moist, well graded, SW, angular, brick and coal fragmients. (FILL).	3.0
0	5 5 5 4	SS03					Loose, Moderate olive Brown, SAND w/ little silt, few gravel, trace coal fragments, moist, well graded,subrounded, (SW) (FILL).	5.0
0	2 3	SS04		5			Very loose, Light - Moderate Brown, fine SAND w/ trace fines, moist, poorly graded, subangular, (SM).	6.0
2	4 4 4 5	SS05					Loose, Light Brown, fine SAND, moist, poorly graded, subangular, (SM).	8.0
2.9	4 4 6 6	SS06					Loose, Light yellowish Brown, fine SAND, dry, poorly graded, trace bedding, (SM).	10.0
3.2	4 6 5 6	SS07		10			Top .8 Same as above. Bottom .7 Loose, Light olive Grey, fine SAND w/ trace silt, dry, poorly graded, subangular, laminated 3-6 mm, (SM).	12.0
3.1	3 5 4 5	SS08					Loose, Light olive Grey to Moderate yellowish Brown, interbedded fine SAND w/ trace fines, moist, poorly graded, some fine bedded lamination, (SM).	14.0
3.6	5 3	SS09					Loose, Moderate yellowish Brown, moderate - fine SAND w/ trace fines, moist, poorly graded, (SM).	15.0
2.8	3 4 4 5	SS10		15			Top .2 loose, Moderate yellowish Brown, medium SAND, Bottom .7 Loose, Moderate Grey, medium - coarse SAND, wet, graded, visible staining at WT, (SW).	17.0
1	4 3 5 6	SS11					Loose, Olive Grey, medium SAND w/ coarse interval at top, wet, graded, faint odor present, staining, (SW).	19.0
N/A	2 3						No Recovery.	20.0
0.9	3 4 7 6	SS12		20			*Loose, Light - Moderate olive Grey, fine - medium* SAND w/course gravel, wet, graded, (SW).	22.0
0	2 2 7 6	SS13					Same as above	24.0
0	7 9 10 13	SS14		25			Medium dense, Moderate olive Brown, gravelly SAND w/ little silt, wet, well graded, angular, (SW).	26.0
0	7 8 11 11	SS15					Similar to above except, few - trace fines.	28.0
0	10 9 11 13	SS16					Medium dense, Light olive Grey, sandy GRAVEL w/ trace *silt, wet, well graded, sub rounded,* (GW-SW).	30.0
0	9 10 11 12	SS17		30			Same as above.	32.0
0	5 8 10 9	SS18					Similar to above except, trace silt few cobbles, color being lost w/ fines.	34.0
N/A	20 11 10	SS19		35			Same as above	36.0

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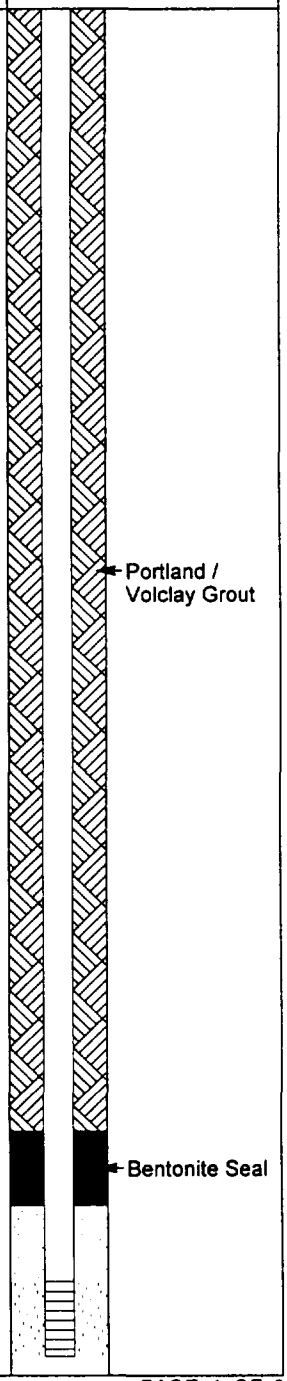

BORING_WELL PDL J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** E2SC-04

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 10/13/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
	9 6 5 5	SS20					Same as above	38.0	
0	7 13 7 6	SS21					Top .5 Same as above. Bottom .4 medium dense, Light olive Brown, SILT w/ little fine sand, wet, poorly graded, (ML).	40.0	#0 Filter Sand .010 Slot 2" PVC Schd 40 Screen
N/A	6 16 16 14			40			No Recovery.	42.0	
1	13 2 2 4	SS22					Loose, Light olive Brown, SILT w/ some gravel, few clay, wet, well graded, (ML) (TILL).	44.0	
0	3 23 30 53 42	SS23		45			Similar too above except, very dense (TILL).	46.0	1' 2" PVC Schd 40 Sump

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	E2SC-05
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	10/26/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	991.42	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	993.24	**DEPTH TO WATER**	
LOGGED BY	MJJ	**GROUND WATER ELEVATION**	
NORTHING	533766.67	**EASTING**	133382

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.8	2 6	SS01					Loose, Light olive - Moderate Brown, silty SAND w/ some organics, dry, well graded, subround, (SM).	1.0
12	20 18 50/.4'	SS02					Medium dense, Light - Moderate olive Brown, SAND w/ some gravel, few fines, dry, well graded, subangular, (SW).	3.0
0.6	8 15 8 5	SS03					Medium dense, Moderate olive Brown, fine SAND w/ little gravel trace fines, dry, well graded, subangular, (SW), (FILL).	5.0
10.2	5 6	SS04		5			Same as above.	6.0
4.5	6 8 4 8	SS05					Similar to above w/ limestone cobbles.	8.0
0	10 7 6 6	SS06					Medium dense, Light olive Brown, fine SAND w/ some gravel, some fines, dry, well graded, (SW), (FILL).	10.0
7	4 5 5 4	SS07		10			Top .1 Same as above, Bottom 1.3 Medium dense, Olive Grey, silty SAND w/ few organics (roots) trace gravel, moist, graded, (SM), (native).	12.0
8	4 12 10 12	SS08					Medium dense, Olive Grey, sandy SILT w/ few clay, trace gravel, moist, well graded, (SM).	14.0
1.5	4 9	SS09					Medium Dense, Olive Grey, sandy GRAVEL w/ few fines, moist, well graded, faint odor (GM).	15.0
17	10 9 9 11	SS10		15			Medium dense, Olive Grey, sandy GRAVEL w/ trace fines, moist, well graded, subangular, faint odor (GW-SW).	17.0
13	10 9 9 11	SS11					Top .3 Same as above, Bottom 1.0 Olive Grey, gravelly coarse SAND w/ trace fines, moist, well graded, faint odor (SW-GW).	19.0
18	11 15	SS12					Medium dense, Olive Grey, gravelly coarse SAND, wet, well graded, (SW-GW).	20.0
15	8 9 9 7	SS13		20			Medium dense, Olive Grey, gravelly coarse SAND, wet, well graded, visable NAPL (SW-GW).	22.0
5.3	9 10 10 10	SS14					Similar too above except, no NAPL	24.0
5.2	11 16 17 20	SS15		25			Dense, Light olive Grey, sandy GRAVEL, wet, well graded, (GW-SW).	26.0
4.8	13 15 16 19	SS16					Dense, Olive Grey, medium - fine SAND w/ trace fines, wet, well graded, (SW).	28.0
3.2	8 15 20 30	SS17					Dense, Olive Grey, gravelly medium SAND, wet, well graded, (SW-GW).	30.0
4.6	7 10 14 24	SS18		30			Medium dense, Olive Grey, medium - fine SAND some gravel, wet, well graded, subangular (SW-GW).	32.0
2.8	26 20 19 13	SS19					Dense, Moderate dark Grey, medium - fine SAND some gravel, trace fines, wet, well graded, subangular (SW-GW).	34.0
3	11 12 15	SS20		35			Medium dense, Dark Brown - Dark Grey, medium SAND w/ few gravel, wet, well graded, slight odor (SW).	36.0

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WELL DIAGRAM

- Portland / Volclay Grout
- Bentonite Seal
- #0 Filter Sand
- .010 Slot 2" PVC Schd 40

BORING_WELL P009...J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** E2SC-05

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 10/26/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
N/A	10	SS21					Medium dense, Olive Grey, SAND w/ some gravel few fines, wet, well graded, visible NAPL (SW-GW).	38.0	Screen
1	17 11 20 18	SS22					Top 0.2 Same as above. Bottom 0.3 Dense, Light olive Brown, sandy SILT, wet, poorly graded, (ML).	40.0	
1.2	25 21 33 51	SS23		40			Very dense, Light olive Brown, fine sandy SILT w/ little gravel, wet, well graded, angular, (ML) (Till).	42.0	1' 2" PVC Schd 40 Sump

BORING_WELL P0... , HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

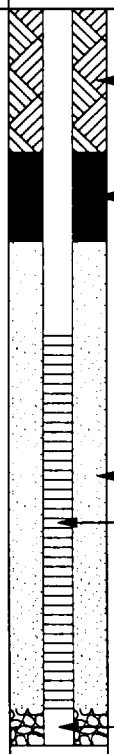
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001
PROJECT NAME Source Control Upper Reach Housatonic River
LOCATION Pittsfield, Massachusetts
DRILLING METHOD HSA
SAMPLING METHOD SS
GROUND ELEVATION 990.46
TOP OF CASING 992.49
LOGGED BY MJJ
NORTHING 533694.74

BORING/WELL NUMBER E2SC-06
DATE DRILLED 10/24/98
CASING TYPE/DIAMETER 2" PVC
SCREEN TYPE/SLOT .010 Slot 2" PVC
GRAVEL PACK TYPE #0 Silica Sand
GROUT TYPE/QUANTITY Portland/Volclay
DEPTH TO WATER
GROUND WATER ELEVATION
EASTING 133304.43

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0.2	6 8	SS01					Loose, Moderate olive Brown, SAND w/ some organics, dry, well graded, (SW).	1.0
0.4	8 15 10 5	SS02					Medium dense, Moderate olive Brown, SAND w/ little organics, few slag, few fines, dry, well graded, (SW), (Fill).	3.0
17	12 6 4 3	SS03					Medium dense, Moderate olive Brown, SAND w/ few gravel, trace organics, dry, well graded, (SW), (Fill).	5.0
15	5 10	SS04		5			Medium dense, Light - Moderate olive Brown, SAND w/ little gravel, few fines, moist, well graded, organic odor (SW).	6.0
0	8 18 6 5	SS05					Medium dense, Moderate olive Brown, SAND w/ some gravel, trace fines, dry, well graded, (SW), (Fill).	8.0
18	3 3 7 5	SS06					Medium dense, Light olive Brown, silty SAND w/ little gravel, wet, well graded, perched water (SW).	10.0
20	5 9 4 1	SS07		10			Medium dense, Light Brown, silty SAND w/ some gravel, wet, graded, sheen (SW).	12.0
750	3 4 2 2	SS08					Top 0.2 Same as above. Middle 0.4 loose, Black, sandy GRAVEL, wet, saturated w/ NAPL (GW-SW). Bottom 0.5 Black, organic peat, saturated w/NAPL, odor.	14.0
580	4 3	SS09					Same as above (Bottom).	15.0
410	14 15 10 4	SS10		15			Top 0.6 Medium dense, Black - Dark Brown, peat organics (roots), wet, saturated w/ NAPL (PT). Bottom 0.4 sandy GRAVEL, moist, well graded, (GW-SW).	17.0
180	8 8 8 9	SS11					Top 0.3 Black, peat, saturated with NAPL. Middle 0.3 Loose, Olive Grey, clay, moist, poor grading, laminated (CL). Next 0.3 loose, Black - Dark Brown, gravelly SAND, wet, well graded, (SW-GW). Bottom 0.3 loose, Light olive Grey, medium SAND, moist, poorly graded, (SP).	19.0

WELL DIAGRAM



BORING_WELL P00... HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001
PROJECT NAME Source Control Upper Reach Housatonic River
LOCATION Pittsfield, Massachusetts
DRILLING METHOD HSA
SAMPLING METHOD SS
GROUND ELEVATION 989.13
TOP OF CASING None
LOGGED BY MJJ
NORTHING 533721.71

BORING/WELL NUMBER E2SC-07
DATE DRILLED 10/27/98
CASING TYPE/DIAMETER 2" PVC
SCREEN TYPE/SLOT .010 Slot 2" PVC
GRAVEL PACK TYPE #0 Silica Sand
GROUT TYPE/QUANTITY Portland/Volclay
DEPTH TO WATER
GROUND WATER ELEVATION
EASTING 133475.36

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.6	3 9	SS01					Loose, Moderate Brown, silty fine SAND w/ some organics trace gravel, dry, well graded, (SW-SM), (soil horizon).	1.0	
0.2	11 13 13 11	SS02					Medium dense, Light to Moderate olive Brown, fine SAND w/ some silt, little gravel, trace coal fragments, dry, well graded, (SW-SM), (Fill).	3.0	
1.6	5 7 5 2	SS03					Same as above.	5.0	
0	3 3	SS04		5			Loose, Light Brown, fine SAND, dry, poorly graded, (SP).	6.0	
0	4 4 5 6	SS05					Loose, Moderate yellowish Brown, fine SAND w/ trace silt, dry, poorly graded, sub-angular (SP).	8.0	
3.8	3 6 5 6	SS06					Medium dense, Dusky Yellow - Moderate Brown, interbedded fine SAND w/ trace gravel, dry, well graded, (SW).	10.0	
2	5 3 3 3	SS07		10			Loose, Moderate yellowish Brown, gravelly SAND w/ trace fines, dry, well graded, sub-angular (SW).	12.0	
3	5 4 4 4	SS08					Similar to above except poor recovery.	14.0	
6		SS09					Loose, Light olive Grey, medium - coarse SAND, moist, graded, faint odor (SP).	15.0	
	3 3 4 4	SS10		15			Loose, Greyish Olive, medium SAND, moist, poorly graded, sub-angular (SP).	17.0	
30	5 5 6 6	SS11					Medium dense, Greyish Olive, medium SAND, wet, poorly graded, sub-angular, strong odor, visible NAPL (SP).	19.0	
28	3 5	SS12					Top 0.3 loose, Medium - Dark Grey, medium - coarse SAND, wet, poorly graded, sub-angular, visible NAPL (SP). Bottom 0.3 loose, Moderate olive Brown, medium - coarse SAND, wet, poorly graded,, sub-angular, no NAPL (SP).	20.0	Portland / Volclay Grout
15	3 5 6 6	SS13		20				22.0	
4	4 5 8 8	SS14					Top 0.2 Same as above (Bottom). Bottom 0.5 medium dense, Light olive Brown, fine SAND w/ some silt, wet, poorly graded, (SP-SM).	24.0	
0.7	14 7 10 15	SS15		25			Same as above (Bottom). Medium dense, Light olive Brown, interbedded SILT - SAND - GRAVEL, wet, wellgraded, sub-angular (GM).	26.0	
6.2	5 5 13 16	SS16					Medium dense, Light - Moderate olive Brown, interbedded SILTS - GRAVELS, wet, well graded, sub-angular (GW-GM).	28.0	
3.6	12 19 20 16	SS17					Same as above.	30.0	
0	22 22 19 21	SS18		30			No Recovery.	32.0	
2.8	10 12 11 23	SS19					Medium dense, Moderate olive Brown, medium - fine SAND w/ few silts, wet, poorly graded, sub-angular (SP-ML).	34.0	
0.2	7 18 13	SS20		35			Dense, Moderate olive Brown, SAND w/ some gravel, trace fines, wet, well graded, angular, faint staining	36.0	

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BORING_WELL POOL J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** E2SC-07

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 10/27/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
1.2	14 19 13 14	SS21					(SW-GW). Top 0.5 Same as above. Bottom 0.3 medium dense, Light olive Brown, silty fine SAND, wet, poorly graded, (SP-SM).	38.0	
0.2	21 12 16 30 35	SS22		40			Dense, Light olive Brown, silty SAND w/ little gravel, few clay, wet, well graded, angular, (SP_SM) (Till).	40.0	

BORING_WELL PO... HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001
PROJECT NAME Source Control Upper Reach Housatonic River
LOCATION Pittsfield, Massachusetts
DRILLING METHOD HSA
SAMPLING METHOD SS
GROUND ELEVATION 986.07
TOP OF CASING None
LOGGED BY MJJ & BB
NORTHING 533526.09

BORING/WELL NUMBER E2SC-08
DATE DRILLED 10/19/98
CASING TYPE/DIAMETER None
SCREEN TYPE/SLOT None
GRAVEL PACK TYPE None
GROUT TYPE/QUANTITY Portland/Volclay
DEPTH TO WATER
GROUND WATER ELEVATION
EASTING 133233.63

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0	8 9	CS01					Loose, Moderate olive Brown, sandy GRAVEL trace fines, moist, well graded, (GW-SW).	1.0	
190	14 20 17 9	SS02					Similar to above except wood fragments.	3.0	
70	5 50 1 1	SS03					Loose, Moderate olive Brown, SAND w/ some wood fragments, little fines, well graded, (SW).	5.0	
190	6 3	SS04		5			Similar to above (sample recovery poor).	6.0	
62	4 3 4 5	SS05					Loose, Moderate to Dark olive Brown, SAND w/ some gravel, organic fragments (wood), poor recovery, (SW-GW).	8.0	
3.7	4 3 3 3	SS06					Loose, Dark Brown, SAND w/ some organics, moist, well graded, (SW).	10.0	
22	2 1 3 1	SS07		10			Top 0.01 very loose, Moderate - Dark Brown, organics and SAND (SW). Middle 0.01 - 0.9 very loose, Moderate - Dark Brown, fine SAND w/ little silt, moist, heavily stained, petroleum odor (SW). Bottom 0.1 very loose, Moderate - Dark Brown, SILT w/ little sand, moist, heavily stained, petroleum odor (ML).	12.0	
30	7 9 34 12	SS08					Dense, Black, SAND w/ little fines, wet (NAPL), well graded, heavily stained, strong odor (SW).	14.0	
30	5 4	SS09					Loose, Light olive Brown, medium - fine SAND, wet, poorly graded, strong odor, sluf is full of NAPL (SP).	15.0	
4.5	3 6 8 6	SS10		15			Medium dense, Moderate olive Brown, fine SAND few fines, wet, laminations 1-3mm (SP).	17.0	
N/A	7 7 7 8	SS11					Same as above.	19.0	
N/A	4 3						No Recovery.	20.0	
3	4 3 6 9	SS13		20			Loose, Olive gray, fine SAND fines, wet, laminated (SP).	22.0	Portland / Volclay Grout
2.6	10 6 5 4	SS14					Medium dense, Olive Grey, fine SAND trace gravel and fines, sub-angular (SW).	24.0	
N/A	4 4 4 6 7	SS15		25			Medium dense, dark olive Gray, subrounded to subangular GRAVEL trace fines,wet, (GM).	26.0	
2.5	6 8 8 6	SS16					Medium dense, Olive Grey, GRAVEL few fines, wet, sub-angular to sub-rounded (GM).	28.0	
N/A	6 8 9 9						No Recovery.	30.0	
N/A	2 1 4 8			30			No Recovery.	32.0	
1	9 6 8 6	SS19					Mediun dense, Greyish Olive w/ Greyish Yellow mottling, fine - medium SAND w/ gravel, sub-rounded to sub-angular (SW-GW).	34.0	
N/A	4 5 4	SS20		35			Loose, Greyish Olive, fine - medium SAND and GRAVEL, wet, (SW-GW).	36.0	

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BORING_WELL POO...J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** E2SC-08

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 10/19/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0	4 5 5 4	SS21					Top 0.5 loose, Dark yellowish Orange, SAND and GRAVEL trace clays, sub-angular (SW-GW). Bottom 0.25 loose, Brownish Black, GRAVEL trace sand, sub-angular to sub-rounded (GP).	38.0	
0.4	8 8 10 15	SS22		40			Medium dense, Light olive Grey, fine SAND some gravel, some fines, sub-angular (SW-GW).	40.0	
0.4	16 12 14 23	SS23					Dense, Light olive Grey, silty SAND w/ little clay and gravel, sub-angular to angular (SW-ML).	42.0	
N/A	24 28 37 37 39						Same as above.	44.0	

BORING_WELL P009-001 HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	E2SC-09
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	10/21/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	983.48	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	984.78	**DEPTH TO WATER**	
LOGGED BY	BB	**GROUND WATER ELEVATION**	
NORTHING	533432.5	**EASTING**	133294.79

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
N/A	3 3	CS01					Very loose, Dark yellowish Brown, clayey SILT, dry, OL.	1.0	
10	5 5 3 3	SS02					Loose, Greyish Brown, clayey SILT trace pebbels, dry, (OL).	3.0	
0	3 3 4 6	SS03					Loose, Greyish Brown, clayey SILT some gravel, trace sand , dry, (ML-GM).	5.0	
0.2	4 6	SS04		5			Loose, Brownish Black, sandy clayey SILT trace gravel, coal ash and brick fragments, (ML-SM).	6.0	
6	7 3 4 5	SS05					Loose, Pale Olive, SILT and very fine SAND trace clay, trace gravel root fragments, (ML-SM).	8.0	
36	3 4 4 4	SS06					Loose, Light olive Grey, fine SAND some silt, trace clay root fragments, slight odor (SM).	10.0	
28	2 1 5 6	SS07		10			Top 1.0 Same as above. Middle 0.5 loose, Olive Grey, SILT some sand, (SM) Bottom 0.5 loose, Black, SAND, wet, LNAPL (SW).	12.0	Portland / Volclay Grout
26	10 14 9 3	SS08					Medium dense, Black, SAND and GRAVEL, wet, odor (SW-GW).	14.0	
6.5	3 5	SS09					Loose, Black, medium - coarse SAND and GRAVEL, wet, sheen, odor (SW-GW).	15.0	
6	10 24 11 10	SS10		15			Dense, Light olive Grey, SAND and GRAVEL, wet, sub-angular to sub-rounded (SW-GW).	17.0	
16.5	3 10 9 8	SS11					Medium dense, Pale Olive, SAND some gravel, wet to moist, (SW-GW).	19.0	
6	9 5	SS12					No Recovery.	20.0	
8	10 5 6 6	SS13		20			Medium Dense, Olive Grey, medium - coarse SAND some gravel, wet, (SW-GW).	22.0	
11	11 13 13 11	SS14					Top 0.5 medium dense, Olive Grey, silty SAND trace gravel, (SM). Bottom 0.5 medium dense, GRAVEL and SAND some silt and clay, (SW-GW).	24.0	
6	8 8 10 4	SS15		25			Medium dense, Light Olive, SAND and GRAVEL some clay, (SW-GW).	26.0	Bentonite Seal
2	28 13 12 11	SS16					Top 0.5 Same as above. Bottom 1.5 Medium dense, Dark yellowish Orange, GRAVEL and SAND trace silt and clay, (SW-GW).	28.0	
25	21 18 22 9	SS17					Dense, Pale Olive w/ Dark Grey staining, GRAVEL w/ silt, (GM).	30.0	
12	8 22 24 16	SS18		30			Dense, Olive Grey w/ layered dark staining, fine SAND and SILT some gravel, (SM).	32.0	
6	27 21 18 22	SS19					Dense, Greyish Yellow w/ black staining, SILT and GRAVEL, slight sheen (GM).	34.0	#0 Filter Sand
7	8 16 25	SS20		35			Dense, Grayish Yellow w/ Black staining, SILT and fine SAND gravel, (SM).	36.0	.010 Slot 2" PVC Schd 40

Continued Next Page

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** E2SC-09

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 10/21/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
4	28 26 36 18	SS21					Same as above.		Screen
8	9 19 13 9	SS22					Medium dense, Pale Olive, clayey SILT some gravel, Till (ML).	38.0	
1	6 29 49 52 50	SS23		40			Very dense, Olive Gray, SILT some clay and gravel, Till (ML).	40.0 42.0	1' 2" PVC Schd 40 Sump Cave in

BORING_WELL P00... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	E2SC-10
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	10/20/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	None
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	None
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	None
GROUND ELEVATION	989.19	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	None	**DEPTH TO WATER**	
LOGGED BY	BB	**GROUND WATER ELEVATION**	
NORTHING	533371.08	**EASTING**	133188.44

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
1	3 5	CS01					Loose, Moderate olive Grey, silty CLAY some clay root fragments, (CH), (top soil).	1.0	
1	5 5 5 5 4	SS02					Loose, Olive Grey, silty SAND trace clay, (SM).	3.0	
36	4 6 5 5	SS03					Top 0.25 loose, Dark Grey to Black, organic granular material, no odor. Bottom 2.5 loose, Olive Grey, fine SAND trace clays, laminated (SM).	5.0	
0.3	3 5	SS04		5			Same as above (Bottom).	6.0	
1	4 4 7 7	SS05					Top 0.5 Same as above. Bottom 1.5 loose, Light olive Grey (salt and pepper), medium SAND trace fines, dry, (SW).	8.0	
3.8	6 6 7 6	SS06					Medium dense, Light olive Grey, fine - medium SAND and GRAVEL, dry, sub-rounded (SW-GW).	10.0	
1	5 7 6 5	SS07		10			Same as above.	12.0	
0	5 5 6 7	SS08					Medium dense, Light olive Grey (salt and pepper), medium SAND trace gravel, dry, sub-rounded, some Fe stained laminations, (SW).	14.0	
N/A	7 8	SS09					Same as above.	15.0	Portland / Volclay Grout
1	8 8 8 8	SS10		15			Medium dense, Light olive Grey (salt and pepper), medium - coarse SAND trace gravel and qtz cobbles, (SP).	17.0	
0	6 6 6 3	SS11					Loose, Light olive Grey, fine - medium SAND some silt, trace clay, wet, laminations (SM).	19.0	
0.5	3 5	SS12					Top 0.5 Same as above. Bottom 0.5 loose, Light olive Grey (salt and pepper), medium SAND, wet, (SW).	20.0	
0.2	3 6 3 2	SS13		20			Top 0.5 Same as above (Bottom). Bottom 1.5 loose, Dark yellowish Orange, medium - coarse SAND some gravel, sub-rounded to sub-angular (SW-GW).	22.0	
0.2	7 8 11 15	SS14					Top 0.25 Same as above (Bottom). Bottom 1.5 loose, Pale Olive, GRAVEL trace cobbles, sub-rounded to sub-angular (GW).	24.0	
0.5	18 10 5 18	SS15		25			Same as above (Bottom).	26.0	
0	14 12 26 28	SS16					Top 1 Dense, Olive Grey, GRAVEL some sand and fines, well graded, (GW-SW). Bottom 1 Same but clay inc. trace sand	28.0	
0	46 50 29 26 28 34	SS17		30			Dense, Greyish Olive, SILT and CLAY w/ some gravel and cobbles, well graded, (ML), (Till).	30.0	

BORING_WELL POL... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001
PROJECT NAME Source Control Upper Reach Housatonic River
LOCATION Pittsfield, Massachusetts
DRILLING METHOD HSA
SAMPLING METHOD SS
GROUND ELEVATION 990.06
TOP OF CASING None
LOGGED BY MJJ
NORTHING 533339.37

BORING/WELL NUMBER E2SC-11
DATE DRILLED 10/9/98
CASING TYPE/DIAMETER None
SCREEN TYPE/SLOT None
GRAVEL PACK TYPE None
GROUT TYPE/QUANTITY Portland/Volclay
DEPTH TO WATER
GROUND WATER ELEVATION
EASTING 133135.01

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0.2	2 3	SS01					Very loose, Moderate to Dark Brown, medium to fine SAND, w/ some organics, moist, poorly graded, (SP).	1.0	
0	6 6 6 6 3	SS02					Medium loose, Moderate yellowish Brown, fine SAND, w/ few interbeded medium sand lenses, (SP).	3.0	
0	6 6 6 5	SS03					Similar too above except no medium sand lenses, finely laminated, dry.	5.0	
0	4 3	SS04		5			Same as above.	6.0	
0.4	4 4 4 3	SS05					Same as above.	8.0	
0.2	4 3 4 4	SS06					Same as above.	10.0	Portland / Volclay Grout
0	2 4 6 6	SS07		10			Similar too above except, few silt lenses.	12.0	
0	4 4 5 7	SS08					Similar too above except, moist.	14.0	
0.2	18 6	SS09					Similar too above except, wet.	15.0	
0.2	7 7 9 11	SS10		15			Same as above.	17.0	

BORING_WELL P00-_ J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	E2SC-12
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	10/19/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	None
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	None
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	None
GROUND ELEVATION	978.87	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	None	**DEPTH TO WATER**	
LOGGED BY	MJJ	**GROUND WATER ELEVATION**	
NORTHING	532980.62	**EASTING**	132560.78

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
N/A	6 6	CS01					No Recovery (Pavement).	1.0	
N/A	5 4 4 5	SS02					No Recovery.	3.0	
0.2	3 4 5 4	SS03		5			Loose, Moderate olive Brown, SAND w/ little gravel trace fines, dry, well graded, sub-rounded (SW).	5.0	
N/A	1 3	SS04					No Recovery.	6.0	
42	1 3 6 13	SS05					Loose, Moderate - Dark Brown, SAND w/ few organic peat and fines, tip of spoon wet, visablly discolored (SW).	8.0	
28	1 2 7 8	SS06					Top 0.6 Same as above. Bottom similar except coarse SAND w/ few gravel trace fines, wet, (SW).	10.0	
14	2 2 4 6	SS07		10			Top 0.4 loose, coarse SAND w/ gravel, (SW). Bottom loose, Moderate to Dark olive Brown, fine SAND w/ trace fines, wet, poorly graded, (SM).	12.0	
10	4 8 4 8	SS08					Medium dense, Moderate olive Brown, clayey SILT, wet, poorly graded, laminate 1-4mm (ML).	14.0	
	6 11	SS09					Medium dense, Moderate olive grey Brown, silty SAND w/ trace gravel, wet, well graded, interbedded (SM).	15.0	
				15			No Sample Taken	16.0	Portland / Volclay Grout
4.2	7 7 8 9	SS10					Medium dense, Moderate olive Brown, SAND w/ some gravel trace fines, wet, well graded, sub-rounded (SW-GW).	18.0	
1.8	6 6 8 12	SS11					Top 0.3 Medium dense, Moderate olive Brown, SAND w/ little gravel trace fines, wet, well graded, (SW). Bottom 0.5 Medium dense, Moderate olive Brown, SAND, wet, poorly graded, SW.	20.0	
0.2	6 7 8 9	SS12		20			Medium dense, Light olive Brown, coarse - medium SAND w/ some gravel trace fines, wet, well graded, (SW-GW).	22.0	
N/A	2 4 12 10	SS13					No Recovery.	24.0	
0.4	4 7 7 12	SS14		25			Medium dense, Greyish Olive, medium - coarse SAND w/ few gravel trace fines, wet, graded, (SW).	26.0	
0.4	4 4 7 3	SS15					Medium dense, Moderate olive Brown, silty SAND w/ trace gravel, wet, poorly graded, laminated 1-3mm (SP).	28.0	
0	8 58 13 17	SS16					Very dense, Moderate olive Brown, SAND w/ some silt few gravel, wet, well graded, (SM).	30.0	
0.6	16 24 76 70	SS17		30			Very Dense, Light olive Brown, SAND w/ little gravel few fines, moist, well graded, (SW), (Till).	32.0	

BORING_WELL P00s_... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

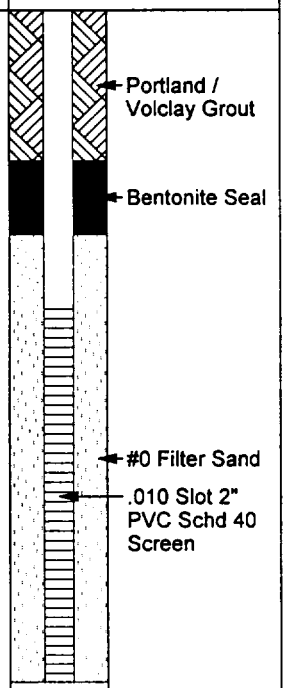
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001
PROJECT NAME Source Control Upper Reach Housatonic River
LOCATION Pittsfield, Massachusetts
DRILLING METHOD HSA
SAMPLING METHOD SS
GROUND ELEVATION 988.09
TOP OF CASING 989.89
LOGGED BY MJJ
NORTHING 533715.98

BORING/WELL NUMBER E2SC-13
DATE DRILLED 10/7/98
CASING TYPE/DIAMETER 2" PVC
SCREEN TYPE/SLOT .010 Slot 2" PVC
GRAVEL PACK TYPE #0 Silica Sand
GROUT TYPE/QUANTITY Portland/Volclay
DEPTH TO WATER
GROUND WATER ELEVATION
EASTING 133679.03

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0	6 10	CS01					Loose, Moderate yellowish Brown, SAND w/ little fines and gravel, sub-rounded (SW).	1.0
0	11 13 14 20	SS02					Medium dense, Moderate Brown, SAND w/ some gravel trace fines, dry, (SW-GW).	3.0
0	7 7 4 3	SS03					Same as above.	5.0
0	6 4	SS04		5			Loose, Moderate Brown, SAND w/ some gravel little fines, dry, sub-rounded (SW-GW).	6.0
N/A	7 5 4 3						No Sample Taken	8.0
N/A	3 2 2 3	SS05					Loose, Moderate Brown, fine - medium SAND w/ trace fines, moist, poorly graded, (SP).	10.0
0	10 12 14 4	SS06		10			No Recovery (Drove cobble).	12.0
0	4 6 6 5	SS07					Medium dense, Light olive Grey and Light olive Brown, SAND w/ some gravel, moist, laminated fine sand zone, (SW-GW).	14.0
N/A	3 2 2 1	SS08		15			Loose, Light olive Grey, medium SAND, wet, poorly graded, laminated (salt and pepper) (SW).	16.0
N/A	3 2 2 2	SS09						18.0

WELL DIAGRAM



BORING_WELL POL . J HSI_MA.GDT 2/5/99

HSI GEOTRANS
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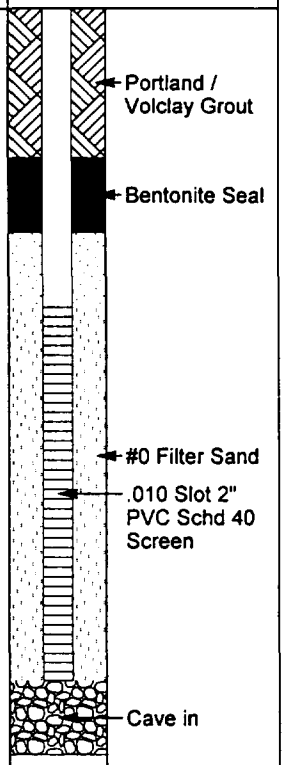
BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	E2SC-14
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	10/8/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	990.19	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	992.25	**DEPTH TO WATER**	
LOGGED BY	MJJ	**GROUND WATER ELEVATION**	
NORTHING	533793.69	**EASTING**	133536.48

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0		SS01					Loose, Medium to Dark Brown, organic SAND w/ few gravel, moist, (SW), (Top soil/ Fill).	1.0
0		SS02					Medium dense, Moderate Brown, SAND w/ little gravel, few fines, moist, (SW).	3.0
0		SS03					Loose, Light to Pale olive Brown, SAND w/ trace fines, moist, poorly graded, (SP).	5.0
1		SS04		5			Loose, Light olive Brown, fine SAND, moist, poorly graded (SP).	6.0
1.1		SS05					Similar too above except, silty SAND.	8.0
2.3		SS06					Similar to above except fine to medium SAND.	10.0
0		SS07		10			Similar too above except, medium SAND.	12.0
0.7		SS08					Loose, Light olive Grey, medium to fine SAND w/ trace fines, moist, poorly graded, brown staining from bottom 0.6 (SP).	14.0
0.8		SS09		15			Similar too above except, medium SAND, interbeded silt lens .4 to .6	16.0
10.2		SS10					Similar too above except, no silt lens, wet.	18.0
0		SS11		20			Medium dense, Light olive Grey, clayey SILT, wet, poorly graded, (MH).	20.0



BORING_WELL PU... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001
PROJECT NAME Source Control Upper Reach Housatonic River
LOCATION Pittsfield, Massachusetts
DRILLING METHOD HSA
SAMPLING METHOD SS
GROUND ELEVATION 984.34
TOP OF CASING N/A
LOGGED BY MJJ
NORTHING 532834.93

BORING/WELL NUMBER E2SC-15
DATE DRILLED 10/20/98
CASING TYPE/DIAMETER None
SCREEN TYPE/SLOT None
GRAVEL PACK TYPE None
GROUT TYPE/QUANTITY Portland/Volclay
DEPTH TO WATER
GROUND WATER ELEVATION
EASTING 131544.48

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0	3 4 6 2	SS02					Loose, Moderate olive Brown, SAND w/ little gravel, few fines(organics), dry, well graded, (SW).	3.0	
	5 4 3 4	SS03					Loose, Moderate olive Brown to Dusk yellow Brown, SAND w/ little gravel, few fines, dry, coal slag fragments (SW), (Fill).	5.0	
1.8	4 4 4	SS04		5			Same as above.	6.0	
0	3 6 6 18	SS05					Medium dense, Dark yellowish Brown, fine SAND w/ trace fines and gravel, dry, graded, (SW), (Fill).	8.0	
1.4	4 5 7 6	SS06					Similar to above except wood fragments.	10.0	
0	3 4 8 9	SS07		10			Medium dense, Light olive Grey to Moderate olive Brown, fine SAND w/ few fines, trace organics, poorly graded, Iron staining (SP).	12.0	
5	3 2 5 1	SS08					Loose, Light olive Grey, SAND w/ trace fines interbedded w/ fine - medium sand and trace organics, wet, graded, (SW).	14.0	
0.2	4 6 4 10	SS09					Loose, Light olive Grey to Moderate olive Brown, sandy GRAVEL w/ trace organics, wet, well graded, sub-angular (GW-SW).	15.0	
0.4		SS10		15				16.0	
0.2	4 8 10 13	SS11					Same as above Medium dense, Moderate olive Brown, sandy GRAVEL few fines, wet, well graded, sub-angular (GW-SW).	18.0	
8.2	10 5 3 7	SS12					Top 0.6 Same as above. Bottom 0.5 loose, Light olive Grey, silty SAND, wet, poorly graded, (SP-SM).	20.0	Portland / Volclay Grout
0	4 4 4 6	SS13		20			Loose, Greyish Olive, silty fine SAND w/ trace clay, wet, poorly graded, laminated 1-3mm (SP-SM).	22.0	
0	3 5 9 10	SS14					Top 0.6 Same as above. Bottom 0.7 Medium dense, Greyish Brown to Moderate olive Brown, medium SAND, wet, poorly graded, top of sand has grayish interval (SW)	24.0	
0.4	4 6 9 11	SS15		25			Same as above (Bottom).	26.0	
0	5 13 28 60	SS16					Top 0.9 Same as above. Bottom 0.2 Dense, Olive Grey, SAND and GRAVEL w/ trace fines, wet, well graded, sub-rounded (SW-GW).	28.0	
0	6 12 26 45	SS17					Dense, Olive Grey to Moderate olive Brown, sandy GRAVEL w/ few fines, wet, well graded, sub-rounded (GW-SW).	30.0	
N/A	10 28 33 34	SS18		30			No Recovery.	32.0	
0	8 16 24 17	SS19					Dense, Light olive Brown, SAND w/ some silt, few gravel, wet, well graded, sub-angular, glacial outwash (SM).	34.0	
0	17 33 66	SS20		35			Very dense, Light olive Brown, silty SAND w/ some gravel few clay, moist, well graded, sub-angular (SM), (Till).	36.0	

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BORING_WELL POL J HSI_MA.GDT 2/5/99

HSI GEOTRANS
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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** E2SC-15

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 10/20/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM	
	71									

BORING_WELL P00...J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	E2SC-16I
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	11/10/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	985.95	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	987.77	**DEPTH TO WATER**	
LOGGED BY	NSB	**GROUND WATER ELEVATION**	
NORTHING	533539.68	**EASTING**	133513.9

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
							See Soil Boring "E2SC-16S"		
0.4	3 6 8 9	SS12		20			Medium dense, Dark Grey, coarse SAND trace fines, wet, well graded, (SW).	18.0	
2	3 5 7 7	SS13					Similar to above except middle 0.8 light olive gray.	20.0	
15	6 6 10 11	SS14					Top 0.8 Medium dense, Dark Grey to Moderate olive Grey, SAND, wet, poor grading, coarsening downward (SP). Bottom 0.4 Medium dense, Moderate olive Grey, fine SAND, trace silt, wet, well graded, (SW).	22.0	
24	5 8 10 15	SS15		25			Top 0.2 Medium dense, Dark Grey, fine SAND, wet, well graded, (SW). Bottom 1.0 Light to Moderate olive Grey, fine SAND little silt, wet, well graded, (Sw).	24.0	
16	9 8 10 10	SS16					Medium dense, Moderate olive Grey, fine to medium SAND trace silt, wet, well graded, chunk of metal slag on side of sample (SW).	26.0	
15	3 4 7 12	SS17					Medium dense, Moderate olive Grey, SAND trace silt and gravel, wet, well graded, (SW).	28.0	
20	5 6 9 11	SS18		30			Top 0.3 medium dense, Light Grey, fine SAND trace fines, wet, well graded, laminations (SW). Bottom 0.3 Moderate Grey, medium SAND, wet, well graded, (SW).	30.0	
42	8 10 12 11	SS19					Top 0.3 Same as above (Top). Bottom 0.7 Moderate olive Grey, coarse to medium SAND, wet, well graded, (SW).	32.0	
40	4 7 11	SS20		35			Same as above (Bottom).	34.0	Bentonite Seal
								36.0	

Continued Next Page

Portland / Volclay Grout

BORING_WELL P00... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** E2SC-16I

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 11/10/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
N/A	11 9 10 13	SS21					No Recovery.		
								38.0	
130	10 4 5 16	SS22					Medium dense, Moderate olive Grey, SAND w/ few gravel, wet, well graded, sub-angular, visable NAPL (SW).		
								40.0	
80	21 18 35 37	SS23		40			Same as above except very dense.		
								42.0	
N/A	36 14 17 16	SS24					No Recovery.		#0 Filter Sand
								44.0	.010 Slot 2" PVC Schd 40 Screen
5	33 9 15 25	SS25		45			Top 0.8 Medium dense, Moderate olive Brown, SAND w/ little gravel, wet, well graded, sub-rounded, visable NAPL (SW). Bottom 0.2 Dense, Moderate olive Grey to Moderate olive Brown, SILT little gravel, wet, well graded (ML).		
								46.0	
15	37	SS26					Top 0.3 Moderate olive Brown, SAND, wet, well graded, (SW). Bottom 0.3 Moderate olive Grey, gravelly SILT, well graded, (ML), (Till).		
								48.0	
12		SS27					Light olive Grey to Yellowish Grey, fine SAND some weathered cobbles little silt, wet, well graded, (SM), (Till).		1' 2" PVC Schd 40 Sump Cave in
								50.0	

BORING_WELL POOL_HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001
PROJECT NAME Source Control Upper Reach Housatonic River
LOCATION Pittsfield, Massachusetts
DRILLING METHOD HSA
SAMPLING METHOD SS
GROUND ELEVATION 985.78
TOP OF CASING 987.69
LOGGED BY MJJ
NORTHING 533542.88

BORING/WELL NUMBER E2SC-16S
DATE DRILLED 10/8/98
CASING TYPE/DIAMETER 2" PVC
SCREEN TYPE/SLOT .010 Slot 2" PVC
GRAVEL PACK TYPE #0 Silica Sand
GROUT TYPE/QUANTITY Portland/Volclay
DEPTH TO WATER
GROUND WATER ELEVATION
EASTING 133523.7

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
0	7 13	CS01					Medium dense, Medium Brown, organic SAND w/ few gravel, moist, (CL), (Top soil/ Fill).	1.0
0	7 6 6 7 7	SS02					Medium dense, Dark Brown to Black, medium SAND w/ few gravel, trace fines, moist, well graded, (SW), (Fill).	3.0
	6 6 7 8	SS03					Dark Brown to Black, medium SAND w/ some cinders and coal ash, moist, (SW), (Fill).	5.0
	6 3	SS04		5			Same as above.	6.0
0.8	2 1 2 1	SS05					Top Same as above. Bottom 0.4, loose, Olive Brown, medium to course SAND, moist, well graded, (SW).	8.0
5.5	3 3 4 3	SS06					Loose, Interbeded cinders and sand units, (Fill).	10.0
6	6 6 7 9	SS07		10			Medium dense, Black, coal ash and slag, (Fill).	12.0
5.4	11 5 6 8	SS08					Same as above.	14.0
71.4	8 12	SS09					Loose, Black, gravelly SAND, moist, well graded, SW, heavily stained, (Fill).	15.0
0.4	25 7 4 4 2 2	SS10		15			Loose, Light olive Grey, medium to course SAND, wet, stained, (SW), (native).	17.0

WELL DIAGRAM

- Portland / Volclay Grout
- Bentonite Seal
- #0 Filter Sand
- .010 Slot 2" PVC Schd 40 Screen

BORING_WELL P00s.grJ HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	E2SC-17
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	10/27/98
LOCATION	Pittsfield, Massachusetts	**CASING TYPE/DIAMETER**	2" PVC
DRILLING METHOD	HSA	**SCREEN TYPE/SLOT**	.010 Slot 2" PVC
SAMPLING METHOD	SS	**GRAVEL PACK TYPE**	#0 Silica Sand
GROUND ELEVATION	983.76	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	985.38	**DEPTH TO WATER**	
LOGGED BY	NSB	**GROUND WATER ELEVATION**	
NORTHING	533516.03	**EASTING**	133454.75

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0	4 5	CS01					Loose, Black - olive Brown, silty SAND few gravel, dry, well graded, sub-angular, (SW), (soil horizon).	1.0	
1	3 5 4 2	SS02					Loose, Moderate yellowish Brown, fine - medium SAND few fines, trace gravel, dry, well graded, (SW).	3.0	
50	1 6 3 4	SS03					Loose, Olive Black, fine SAND few fines coal fragments, dry, well graded, (SW), (Fill).	5.0	
12	2 2	SS04		5			Similar to above w/ few coal slag cobbles.	6.0	
30	6 12 12 6	SS05					Medium dense, Olive Black, medium to fine SAND trace fines, some coal fragments, dry, well graded, Fe staining, (SM), (Fill).	8.0	
17	5 3 15 16	SS06					Medium dense, Olive Black - Black, coarse SAND some coal fragments, dry, well graded, Fe staining, (SW), (Fill).	10.0	
5	10 12 9 5	SS07		10			Top and bottom 0.3 Similar to above w/ same coal fragments, moist, Middle 0.1 Loose, Pale greenish Yellow, coarse SAND, dry, well graded, (SW)	12.0	
7	2 3 5 4	SS08					Loose, Black, gravelly coarse SAND, wet well graded, sub-angular (SW-GW).	14.0	
6	1 1 1 2	SS09		15			Top 0.8 Very Loose, Olive Brown, coarse SAND, wet, well graded, (SW). Bottom 0.2 Similar to above except fine SAND trace fines	16.0	
25	7 9 12 22	SS11					Very loose, Black, silty SAND, wet, well graded, (SW). Medium dense, Light olive Grey, medium SAND trace fines, wet, well graded, laminations 1 - 3mm, (SW).	16.0 18.0	← Portland / Volclay Grout
6	5 11 14 17	SS12					Same as above.	20.0	
8	4 7 9 10	SS13		20			Medium dense, Light olive Grey, fine SAND few fines, wet, well graded, laminated (SW).	22.0	
13	6 8 15 13	SS14					Same as above.	24.0	
18	6 9 6 11	SS15		25			Medium dense, Light olive Grey, fine SAND some fines, wet, well graded, laminated (SW).	26.0	
15	5 10 13 20	SS16					Medium dense, Light olive Grey - Greyish Olive, fine SAND some fines, wet, well graded, laminated (SW).	28.0	
N/A	6 10 24 19						No Recovery.	30.0	
N/A	2 4 5 5			30			No Recovery.	32.0	
30	11 10 26 24	SS19					Top 0.4 dense, Greyish Olive, sandy GRAVEL, wet, well graded, sub-rounded, (GW-SW). Bottom 0.4 dense, Greyish Olive, gravely SAND, wet, well graded, sub-rounded (SW-GW).	34.0	← Bentonite Seal
16	7 5 10	SS20		35			Medium dense, greyish Olive, sandy GRAVEL, wet, well rounded, sub-rounded (GW-SW).	36.0	

Continued Next Page

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HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** E2SC-17

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 10/27/98

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
N/A	11 6 4 9						No Recovery.	38.0	
N/A	33 17 11 13						No Recovery.	40.0	
N/A	20 8 18 14			40			No Recovery.	42.0	#0 Filter Sand .010 Slot 2" PVC Schd 40 Screen
72	18 28 56 78	SS24					Very dense, Light olive Grey - Olive Grey, GRAVEL w/ some sand, few fines, wet, well graded, sub-rounded, visable NAPL, outwash (GW-SW).	44.0	
N/A	63 6 100+			45			No Recovery.	44.8	
N/A	30 140						No Recovery.	46.9	
20	16 41 47 43	SS27					Very Dense, Light olive Gray, fine SAND w/ some gravel few fines,weathered cobble, well graded, till, (SM)	49.0	1' 2" PVC Schd 40 Sump Cave in

BORING_WELL P00... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
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BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001
PROJECT NAME Source Control Upper Reach Housatonic River
LOCATION Pittsfield, Massachusetts
DRILLING METHOD Direct Push
SAMPLING METHOD Direct Push
GROUND ELEVATION 980.13
TOP OF CASING None
LOGGED BY DC
NORTHING 533431.48

BORING/WELL NUMBER E2SC-18
DATE DRILLED 12/18/98
CASING TYPE/DIAMETER None
SCREEN TYPE/SLOT None
GRAVEL PACK TYPE None
GROUT TYPE/QUANTITY Bentonite
DEPTH TO WATER
GROUND WATER ELEVATION
EASTING 133310.99

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
		SS01					Top 0.5 Dark yellow Brown to olive Brown TOP SOIL, dry, well graded. Bottom 0.5 Dark yellow Brown to olive Brown TOP SOIL w/ some coarse gravel, dry, well graded. Shake test Negative.	1.0	
		SS02						2.0	
		SS03					Dark yellow Brown TOP SOIL w/ some coarse gravel trace organics trace sand, dry, well graded. Shake test Negative.	3.0	No Well Installed
		SS04						4.0	
		SS05		5			Dark yellow Brown TOP SOIL w/ trace gravel, dry, well graded. Shake test Negative.	5.0	
		SS06					Pale yellow Brown fine SAND w/ trace coal ash, dry, well graded. Shake test Negative.	6.0	
							Pale yellow Brown fine SAND w/ trace coal ash, dry, well graded. Shake test Negative.		
							Olive Brown, SAND w/ staining on bottom 0.3, moist well graded, ODOR. Shake test Negative.		

BORING_WELL P00... J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001
PROJECT NAME Source Control Upper Reach Housatonic River
LOCATION Pittsfield, Massachusetts
DRILLING METHOD Direct Push
SAMPLING METHOD Direct Push
GROUND ELEVATION 980.07
TOP OF CASING None
LOGGED BY DC
NORTHING 533395.21

BORING/WELL NUMBER E2SC-19
DATE DRILLED 12/18/98
CASING TYPE/DIAMETER None
SCREEN TYPE/SLOT None
GRAVEL PACK TYPE None
GROUT TYPE/QUANTITY Bentonite
DEPTH TO WATER
GROUND WATER ELEVATION
EASTING 133261.24

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
		SS01					Brown, TOP SOIL w/ wood chips, little sand, dry, well graded. Shake test Negative.	1.0	
		SS02					Dark yellowish Brown, SAND, dry, well graded. Shake test Negative.	2.0	
		SS03					Top 0.5 Dark yellowish Brown, SAND, dry, well graded.	3.0	
		SS04					Bottom 0.5 Dark Brown, SAND w/ organics, dry, well graded. Shake test Negative.	4.0	
		SS05					Light olive Gray, weathered GRAVEL w/ SAND and coarse subangular GRAVEL, dry, odorless. Shake test Negative.	6.0	No Well Installed
		SS06		5			Moderate yellow brown, SAND w/ gravel, dry, well graded. Shake test Negative.	7.0	
		SS07					Light Brown to Grayish Orange, weathered GRAVEL w/ little coarse Gravel, dry, well graded. Shake test Negative.	8.0	
		SS08					Top 0.5 Light Brown to Grayish Orange, weathered GRAVEL w/ little coarse Gravel, dry, well graded, slight ODOR. Bottom 0.5 Olive Gray, SAND w/ some fines, little coarse, moist, strong ODOR. Slight sheen in shake test.		

BORING_WELL P00s_..J HSI_MA.GDT 2/5/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001
PROJECT NAME Source Control Upper Reach Housatonic River
LOCATION Pittsfield, Massachusetts
DRILLING METHOD Direct Push
SAMPLING METHOD Direct Push
GROUND ELEVATION 980.38
TOP OF CASING None
LOGGED BY DC
NORTHING 533362.04

BORING/WELL NUMBER E2SC-20
DATE DRILLED 12/18/98
CASING TYPE/DIAMETER None
SCREEN TYPE/SLOT None
GRAVEL PACK TYPE None
GROUT TYPE/QUANTITY Bentonite
DEPTH TO WATER
GROUND WATER ELEVATION
EASTING 133227.24

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH	WELL DIAGRAM
		SS01					Dark olive Gray, fine ORGANICS w/ little sand, dry, medium to well graded. Shake test Negative.	1.0	
		SS02					Dark yellowish Brown, SAND w/ trace gravel, dry, well graded. Shake test Negative.	2.0	
		SS03					Grayish Orange, weathered GRAVEL, poorly graded, dry. Shake test Negative.	3.0	
		SS04					Yellowish Gray, medium to coarse SAND w/ little gravel, little cobbles, dry, well graded. Shake test Negative.	4.0	
		SS05					Medium Brown to Grayish Yellow, medium weathered GRAVEL w/ some cobbles, dry, well graded. Shake test Negative.	5.0	No Well Installed
		SS06		5			Moderate Brown, weathered GRAVEL w/ medium to coarse SAND, moist. Slight sheen in shake test.	6.0	
		SS07					Dark Gray, weathered GRAVEL w/ medium to coarse SAND, moist. Slight sheen in shake test.	7.0	
		SS08					Olive Black, fine SAND w/ some Silt, moist, well graded, strong ODOR. Shake test positive.	8.0	

BORING_WELL P00... HSI_MA.GDT 2/5/99

APPENDIX B

GEOPHYSICAL APPLICATIONS, INC.
GEOPHYSICAL SURVEY REPORT

Geophysical Survey Report
Source Control Investigation
Pittsfield, Massachusetts

Prepared for
GENERAL ELECTRIC COMPANY
February 1999

GEOPHYSICAL
APPLICATIONS
INCORPORATED

February 5, 1999

Mr. John Ciampa
GENERAL ELECTRIC COMPANY
100 Woodlawn Avenue
Pittsfield, MA 01201

Subject: Geophysical Survey Report
Source Control Investigation
Pittsfield, Massachusetts

Dear Mr. Ciampa:

Geophysical Applications has performed seismic refraction profiling to help characterize subsurface conditions near the General Electric Plant site and Housatonic River, in Pittsfield, Massachusetts. The primary objective of this survey was to measure apparent depths and elevations of various subsurface soil layers along a series of traverses.

METHODS OF INVESTIGATION

Survey Control

Geophysical Applications located the survey traverses using taped distance measurements referenced to monitoring wells and roads. The base map shown on Figure 1 was provided by Blasland, Bouck and Lee, Inc. of Syracuse, New York.

Vertical survey control included ground-surface elevation measurements at seismic impact points and selected geophones using an electronic theodolite. Those elevation measurements were adjusted to ground surface elevations provided for nearby monitoring wells.

Distances between impact points and geophones on opposite sides of the Housatonic River were measured (where possible) with a laser mounted on the theodolite. Scaled distances from the plan map were substituted for locations where vegetation prevented the laser's use.

Seismic Refraction

Refraction data were acquired using an ABEM Terraloc Mark 6 seismograph with 10-foot geophone spacings. Seismic energy was generated at most locations with a DigiPulse model EWG-1 weight-drop device mounted on a Polaris all-terrain vehicle. The EWG uses a thick rubber band to accelerate a 90-pound hammer onto an aluminum impact plate, thereby producing stronger seismic signals than a free-falling weight. A 20-pound sledge hammer striking an aluminum impact plate provided seismic energy at locations that could not be accessed by the all-terrain vehicle (e.g. Line 11, between the river and a boundary fence).

Seismograph recording was initiated along most traverses by either a switch mounted on the impact plate, or a geophone adjacent to the plate. A radio-link time-break system was used along traverses oriented perpendicular to the river, to allow impact points on the riverbank opposite a geophone array.

Interference from wind noise was minimized by using 30-hertz geophones, with high-pass filters set to 12 hertz. Geophones were coupled to the ground surface with spike bases on soft ground, and tripod bases on pavement or hard ground. Small sand bags were placed on tripod-base geophones to enhance the physical coupling between those geophones and the ground surface.

Refraction seismograms were recorded using 0.25 millisecond sampling intervals, with record lengths of 128 or 256 milliseconds. Seismograms were stored on the ABEM's internal hard drive, and also on floppy diskette for backup data storage.

Seismic impact points were located at approximately 80-foot intervals along each 24-channel geophone spread. Additional offset impact points were placed up to 100 feet beyond each geophone array endpoint, where permitted by site conditions, to help profile deep strata. Four to six impact points were occupied along each geophone array to provide reversed seismic profiles. Depending upon ambient noise conditions, up to ten seismograms were stacked at each impact point to enhance recorded data quality. Each impact point was marked using a pink stake flag, labeled with the seismic line number and impact station.

Refraction data analysis was performed by picking first-arrival times with either the seismograph or Rimrock Geophysics' ASIPIK program, followed by modeling with Rimrock Geophysics' SIPT2 delay-time interpretation software. This software uses a ray-tracing algorithm, in which calculated layer thicknesses beneath each geophone are varied to obtain good agreement between observed and modeled arrival times.

The SIPT2-generated computer models were spot-checked using layer depths manually calculated with the crossover-distance technique. SIPT2 models along some traverses, notably Line 10, initially showed poor correlation with nearby borings. In those cases, manually-calculated refractor depths were substituted for the SIPT2 models.

Seismic interpretations were refined in an effort to obtain agreement within $\pm$ 2 or 3 feet at traverse intersections.

SURVEY LIMITATIONS

This survey was designed to profile relatively thick (greater than approximately 10 feet), continuous strata across the site. Dense soil strata at depths up to approximately 50 feet below ground surface were of particular interest. The survey was not intended to profile the bedrock surface. Subsurface strata too thin to be detected by seismic profiling may be present along any of the attached cross sections.

Seismic velocity values shown on the cross sections were calculated over 24-channel geophone arrays, and therefore represent averaged subsurface conditions.

Dashed lines on the seismic cross sections represent layers where refractor depths were manually-calculated below selected impact points. Note that straight-line interpolations were used between adjacent manual depth calculations. Actual refractor depths between those impact points may differ from the interpolations shown on the attached cross sections.

Seismic survey depth calculations are typically accurate within $\pm$ 10% (or $\pm$ 4 feet, whichever is larger).

RESULTS

Figure 1 shows seismic traverse positions from this survey with respect to nearby topographic and cultural features.

Similar velocity values were observed along most traverses. A near-surface low-velocity layer (1,200 to 1,550 ft/sec) is interpreted to represent unsaturated unconsolidated deposits. An intermediate layer (3,100 to 5,000 ft/sec) probably represents water-saturated unconsolidated deposits. This layer is occasionally thin, and was not confidently detected along all traverses. Values at the lower end of this layer's velocity range might also represent more dense unsaturated deposits (e.g. dense silt or clay).

The lowermost layer shown on each cross section (6,000 to 8,200 ft/sec) is interpreted to represent very dense soils. This layer should correlate with materials that produce high blow counts at soil borings.

Seismic interpretations from three general regions are summarized below.

Western Survey Region

Seismic profiles performed near the west end of the survey region are shown on Figures 2 and 3.

Manual depth calculations were performed along most of Lines 10 and 13, as indicated by dashed lines on those traverses. Seismically-inferred strata elevations are generally in good agreement with nearby monitoring wells. Note that most existing wells are relatively shallow, and therefore only a few wells allowed comparison with the lowermost-layer's interpreted depths.

Along traverses collected north of the river, the lowermost layer appears locally deep near the intersection of Lines 1A and 10 (approximately elevation 940 to 945 feet), and possibly at the east end of Line 13 (approximately elevation 945 feet).

Along traverses collected south of the river, the lowermost layer is deepest (approximately elevation 945 feet) near Line 9 Station 4+30 and Line 12 Station 5+00. Note that highly-irregular surface terrain may have affected seismic depth accuracy along Line 12 between Stations 2+70 through 4+30.

Central Survey Region

Seismic profiles performed near the middle of the survey area are shown on Figure 4. This survey region includes Lines 3, 4 (south of the river), 4A (north of the river), 5A (north of the river), and 11.

Line 5A was shifted slightly east of its proposed location to minimize interference from an extensive concrete slab north of the river. Line 5 south of the river experienced unacceptable interference (and poor seismic data quality) due to loose surficial materials and nearby building foundations, and consequently is not included in this report.

Lines 4 and 4A were offset with respect to each other in an east-west direction, and were therefore modeled individually instead of as a single traverse crossing the river. Line 4A (north of the river) also experienced considerable interference from nearby building foundations, consequently the lowermost refractor's surface is represented by a dashed line on Figure 4.

The lowermost layer's interpreted elevation varies between approximately 940 and 965 feet in this region. This layer's interpreted surface is deepest on Line 11 near Station 2+75, and across the river at Line 5A's south end.

Eastern Survey Region

Seismic profiles performed in the eastern portion of the survey region are shown on Figure 5.

Seismic traverses in this region were generally performed along their proposed positions. Line 11A was shifted slightly south, from dense woods onto the open area of the Hibbard playground. An extra traverse, Line 15, was located diagonally across the playground east of the tennis courts.

A subtle trough in the lowermost layer's interpreted surface is inferred near the intersections of Lines 8, 11A, and 15.

The middle layer's velocity was difficult to accurately determine in this area, because this layer was generally detected by only one or two geophones on each seismogram. This layer's calculated velocity values, as shown on Figure 5, are lower than typically observed for water-saturated soils (i.e. approximately 4,500 - 5,000 ft/sec). If this layer's velocity value is actually higher than calculated, the lowermost layer's interpreted surface may be 5 or 10 feet deeper than shown on Figure 5.

* * * * *

Very truly yours,

GEOPHYSICAL APPLICATIONS, INC.

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NOTES:

1. MAPPING IS BEST AVAILABLE INFORMATION AS OF 12/10/98 BASED ON MAPPING PROVIDED BY LOCKWOOD MAPPING, INC. PREPARED FROM 1990 AERIAL PHOTOGRAPHY; DATA PROVIDED BY GENERAL ELECTRIC; AND BLASLAND AND BOUCK ENGINEERS, P.C. CONSTRUCTION PLANS. RIVERBANK AND RIVER BED TOPOGRAPHIC INFORMATION PROVIDED BY BBL FROM OCTOBER 12-23, 1998 FIELD SURVEY.
2. COORDINATE GRID BASED ON 1927 STATE PLANE COORDINATES.
3. ELEVATION DATUM REFERENCED TO NGVD 1929.
4. CONTOUR INTERVAL IN THE RIVER AND ON RIVERBANK = 1 FOOT CONTOUR. INTERVAL OUTSIDE RIVERBANK AREA = 2 FEET.
5. ALL SAMPLING LOCATIONS ARE APPROXIMATE.

LEGEND:

- APPROXIMATE DELINEATION OF FORMER OXBOWS
- ES2-1 EXISTING MONITORING WELL
- IA-9 ABANDONED MONITORING WELL
- 64X(W) EXISTING OIL RECOVERY CAISSON
- RW-1(X) EXISTING PUMPING WELL
- X-11 EXISTING SOIL BORING
- WP-3 EXISTING PIEZOMETER
- RB-2-6 RIVER BANK SAMPLING LOCATION
- SEISMIC TRANSECT LOCATION (PREVIOUSLY COMPLETED)
- SEISMIC TRANSECT LOCATION (CURRENT SURVEY)
- EXISTING INDEX ELEVATION CONTOUR
- EXISTING INTERMEDIATE ELEVATION CONTOUR
- DECIDUOUS TREE
- CONIFEROUS TREE
- MANHOLE
- CHAIN LINK FENCE
- POLE (NON-UTILITY)
- POLE (OVERHEAD UTILITY)

Silver Lake

Hibbard Playground

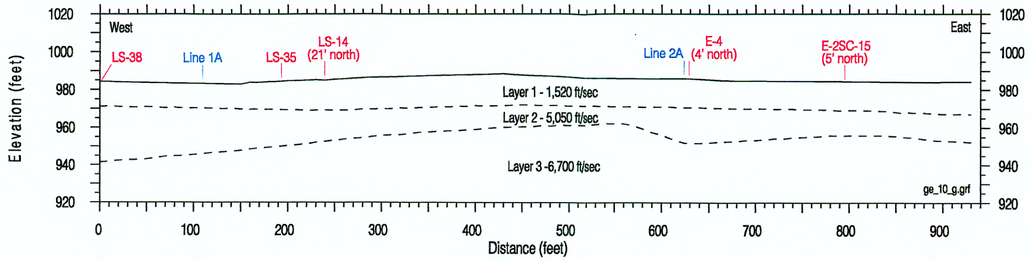
0 120' 240'
GRAPHIC SCALE

Base map provided by Blasland, Bouck & Lee, Inc.

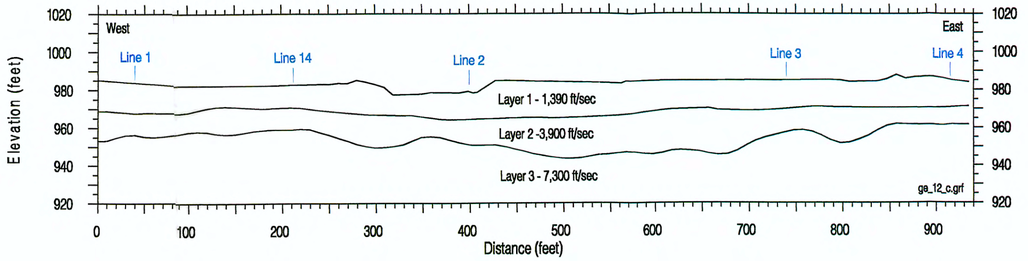
GEOPHYSICAL APPLICATIONS INCORPORATED

Figure 1
Seismic Refraction Survey Coverage
Source Control Investigations
Pittsfield, Massachusetts
prepared for
GENERAL ELECTRIC COMPANY

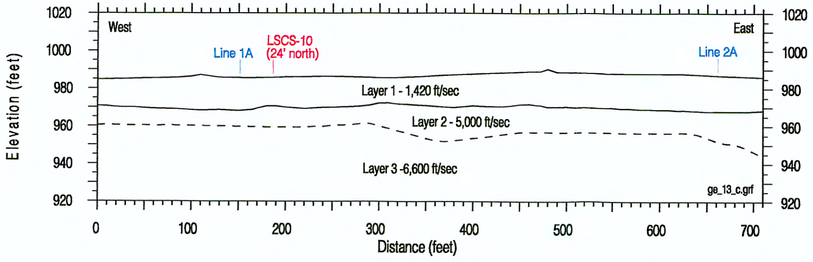
Line 10



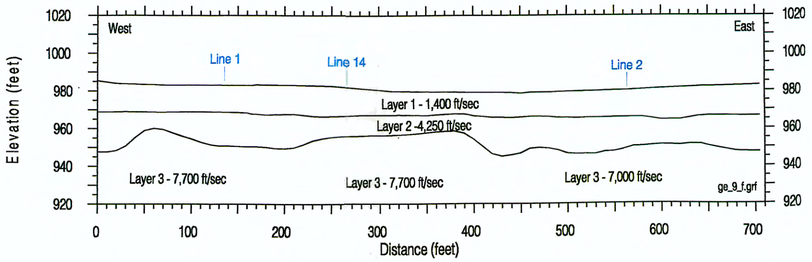
Line 12



Line 13



Line 9



Notes:

1) Seismic velocity values are in units of feet per second (ft/sec)

2) Vertical exaggeration is 2:1

3) Ground elevations are approximate

4) Dashed lines represent interfaces with less-certain geometry

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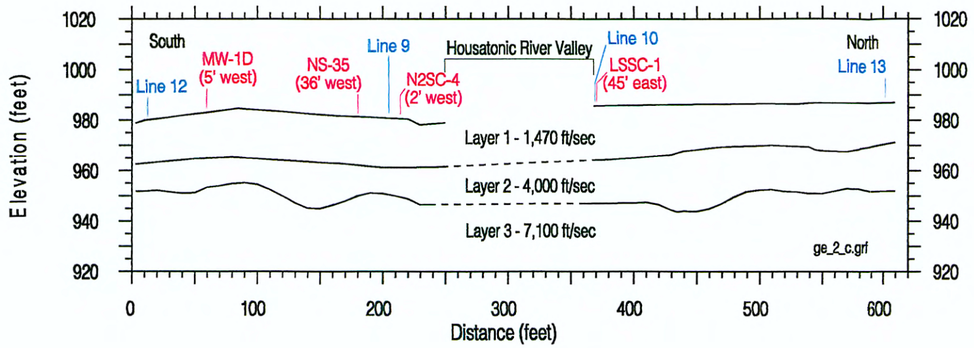
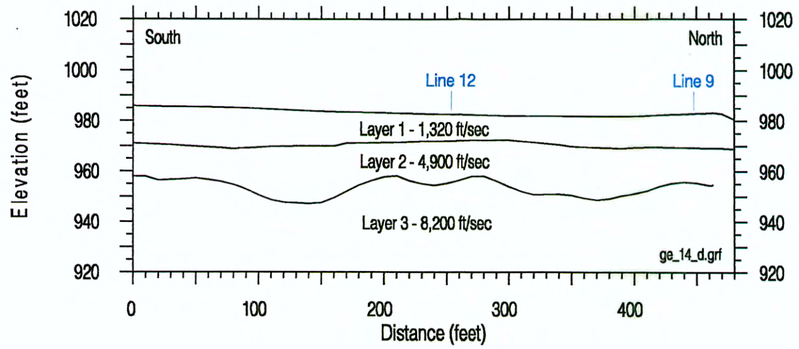
GEOPHYSICAL APPLICATIONS INCORPORATED

Figure 2
Seismic Refraction Cross Sections
Lines 9, 10, 12, and 13
Source Control Investigations
Pittsfield, Massachusetts
prepared for
GENERAL ELECTRIC COMPANY

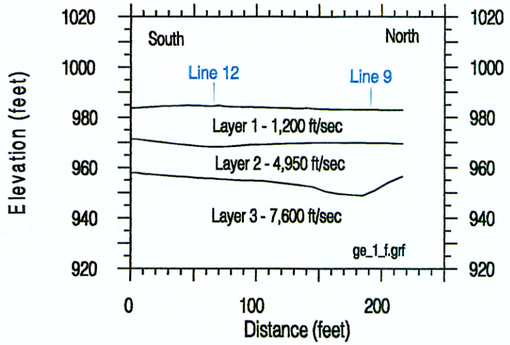
Line 2



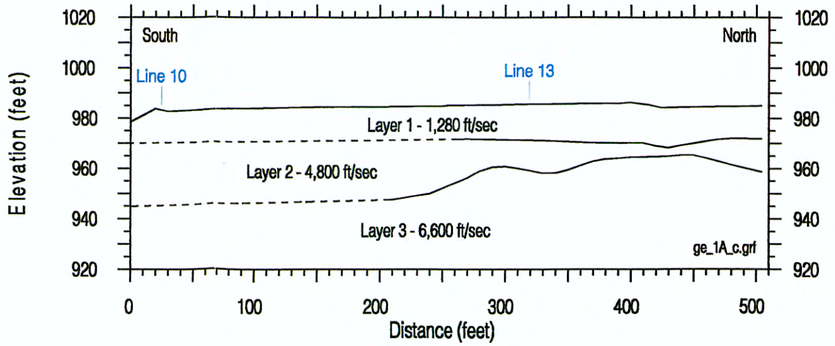
Line 14



Line 1 (south of river)



Line 1A (north of river)



Notes:

1) Seismic velocity values are in units of feet per second (ft/sec)

2) Vertical exaggeration is 2:1

3) Ground elevations are approximate

4) Dashed lines represent interfaces with less-certain geometry

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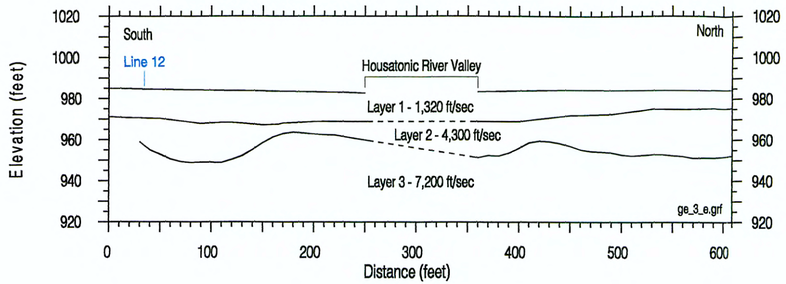
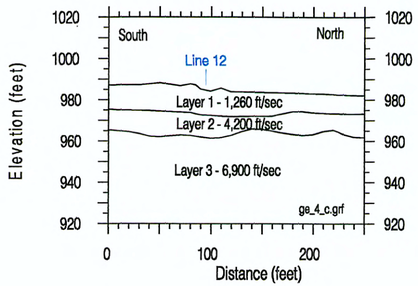
GEOPHYSICAL APPLICATIONS INCORPORATED

Figure 3
Seismic Refraction Cross Sections
Lines 1, 1A, 2, and 14
Source Control Investigations
Pittsfield, Massachusetts
prepared for
GENERAL ELECTRIC COMPANY

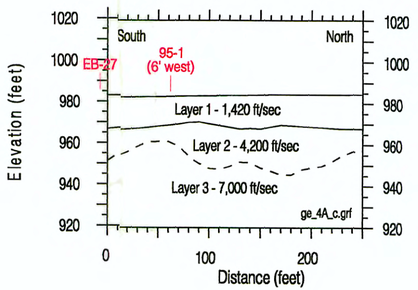
Line 3



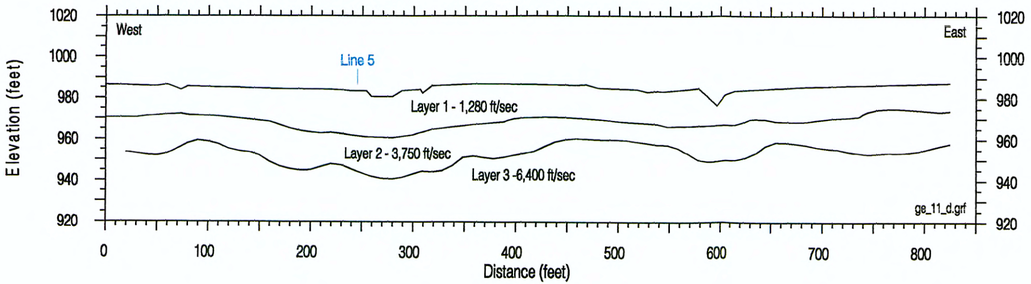
Line 4 (south of river)



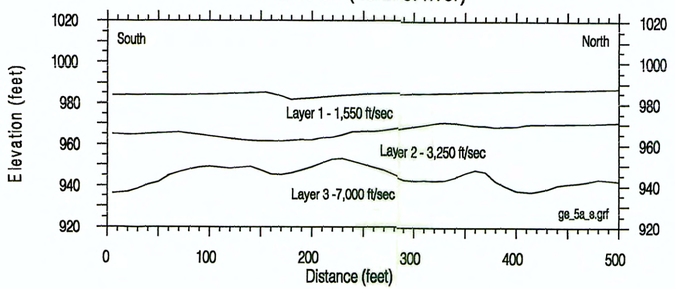
Line 4A (north of river)



Line 11



Line 5A (north of river)



Notes:

1) Seismic velocity values are in units of feet per second (ft/sec)

2) Vertical exaggeration is 2:1

3) Ground elevations are approximate

4) Dashed lines represent interfaces with less-certain geometry

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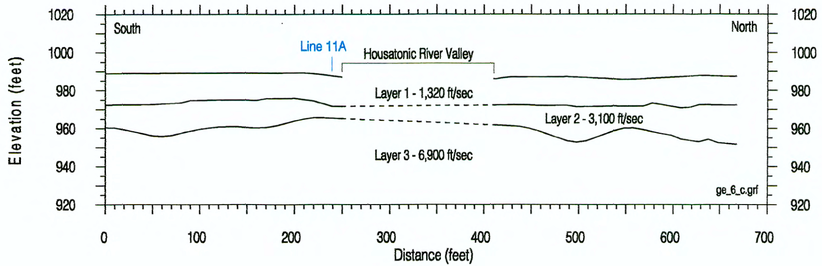
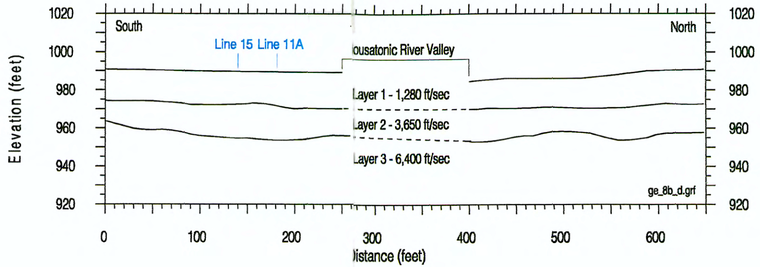
Figure 4
Seismic Refraction Cross Sections
Lines 3, 4, 4A, 11, and 5A
Source Control Investigations
Pittsfield, Massachusetts
prepared for
GENERAL ELECTRIC COMPANY

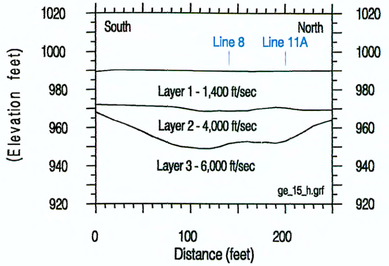
Line 6



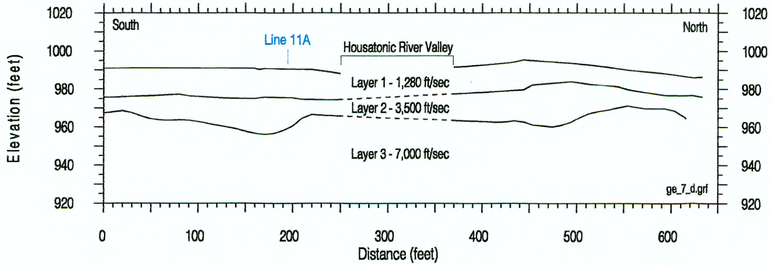
Line 8



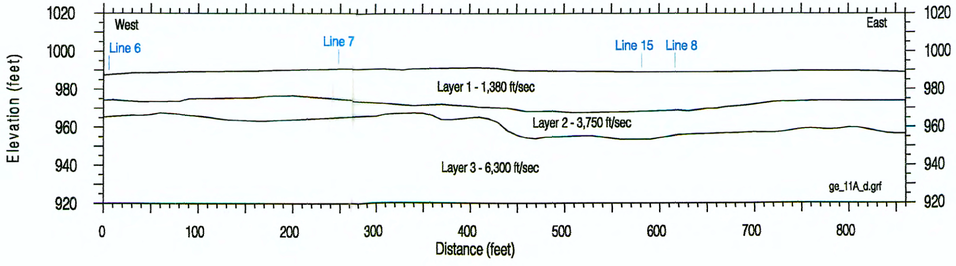
Line 15



Line 7



Line 11A



Notes:

1) Seismic velocity values are in units of feet per second (ft/sec)

2) Vertical exaggeration is 2:1

3) Ground elevations are approximate

4) Dashed lines represent interfaces with less-certain geometry

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last modified 1/31/99

GEOPHYSICAL APPLICATIONS INCORPORATED

Figure 5
Seismic Refraction Cross Sections
Lines 6, 7, 8, 11A and 15
Source Control Investigations
Pittsfield, Massachusetts
prepared for
GENERAL ELECTRIC COMPANY

APPENDIX C

SUMMARY OF DNAPL RECOVERY TEST FOR MONITORING WELL N2SC-1I

APPENDIX C

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

SUMMARY OF DNAPL RECOVERY TESTS FOR MONITORING WELL N2SC-1I

On January 8, 1999, the General Electric Company (GE) submitted a letter to the United States Department of Environmental Protection (USEPA) and the Massachusetts Department of Environmental Protection (MDEP) (collectively referred to as the Agencies) regarding the results of dense non-aqueous phase liquid (DNAPL) pumping tests performed at the Newell Street Area II/USEPA Area 5B Site (the Site) in Pittsfield, Massachusetts. Based on the results of these initial pumping tests, it appeared that an automated DNAPL recovery system may be warranted in monitoring well N2SC-1I, since this well recovered significantly more DNAPL than the surrounding wells and is located in a depression of the till confining layer. To further evaluate the potential recovery volumes in this area, GE proposed to pump DNAPL from monitoring well N2SC-1I for approximately one hour per weekday over a two-week timeframe. Following those activities, an additional one-day pump test was also proposed. To perform the proposed DNAPL recovery tests, a pneumatic pump was installed in the monitoring well. Subsequently, GE in conjunction with BBL recently completed the daily 1-hour recovery tests and the extended 5-hour one-day recovery test. The results of these recovery field tests are presented below.

Between January 15 and 29, 1999, DNAPL was pumped daily from well N2SC-1I over an approximate 1-hour time period. The pneumatic pressure of the pump was set at a level which maximized the DNAPL removal rate without drawing in groundwater from the well. The DNAPL removal volumes ranged from 11 gallons (on January 25, 1999) to 19.5 gallons (on January 21, 1999) (see Table 1 and Figure 1). The total volume of DNAPL recovered was approximately 136 gallons, with an average recovery rate of approximately 0.23 gallons per minute (13.8 gallons per hour). This recovery rate remained relatively constant over the two-week period. The results of the daily 1-hour DNAPL recovery tests are presented on Table 1 and Figure 1.

On February 1, 1999, BBL conducted the one-day DNAPL recovery test in well N2SC-1I. The well was pumped for approximately 5 hours utilizing varied pumping-pressure ranges (between 15 psi and 55 psi). The pump pressure was varied, in an attempt to optimize the rate of DNAPL recovered and minimize foaming of the recovered material. In total, approximately 52 gallons of DNAPL was recovered from monitoring well N2SC-1I during the approximately 5-hour time period, with an average recovery rate of 0.19 gallons per minute (11.8 gallons per hour) (see Table 1 and Figure 2). Although the pump pressure setting was varied, recovery rates remained relatively consistent except at 15 psi (a relatively low pressure), in which case the recovery was likely limited by the capabilities of the pump. The results of the one-day DNAPL recovery test are presented on Table 1 and Figure 2.

Throughout the recovery study, DNAPL was pumped directly into drums which were collected after daily pumping was completed and transported to Building 78 for storage and subsequent disposal.

TABLE 1

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETTS

SUMMARY OF DNAPL RECOVERY TESTS - MONITORING WELL N2SC-11

Summary of 1-hour DNAPL Recovery Tests					
Date	Elapsed Time (minutes)	Pump Pressure (psi)	Interval Volume Recovered (gallons)	Cumulative Volume Recovered (gallons)	Recovery Rate (gallons per minute)
01/15/99	45	45	11.7	11.7	0.26
01/19/99	60	45	11.4	23.1	0.19
01/20/99	60	45	15.1	38.2	0.25
01/21/99	60	45	19.5	57.7	0.33
01/22/99	60	55 for 20 minutes and 45 for 40 minutes	12.4	70.1	0.21
01/25/99	60	50	11.0	81.1	0.18
01/26/99	60	45	14.1	95.2	0.24
01/27/99	60	45	13.0	108.2	0.22
01/28/99	60	45	14.0	122.2	0.23
01/29/99	60	45	14.2	136.4	0.24
Summary of Extended One-day DNAPL Recovery Test					
Date	Elapsed Time (minutes)	Pump Pressure (psi)	Interval Volume Recovered (gallons)	Cumulative Volume Recovered (gallons)	Recovery Rate (gallons per minute)
02/01/99	58	45	15.5	15.5	0.27
02/01/99	22	55	3.1	18.6	0.14
02/01/99	19	45	4.3	22.9	0.23
02/01/99	55	35	10.0	32.9	0.18
02/01/99	59	25	9.8	42.7	0.17
02/01/99	37	20	7.7	50.4	0.21
02/01/99	25	15	1.5	51.9	0.06

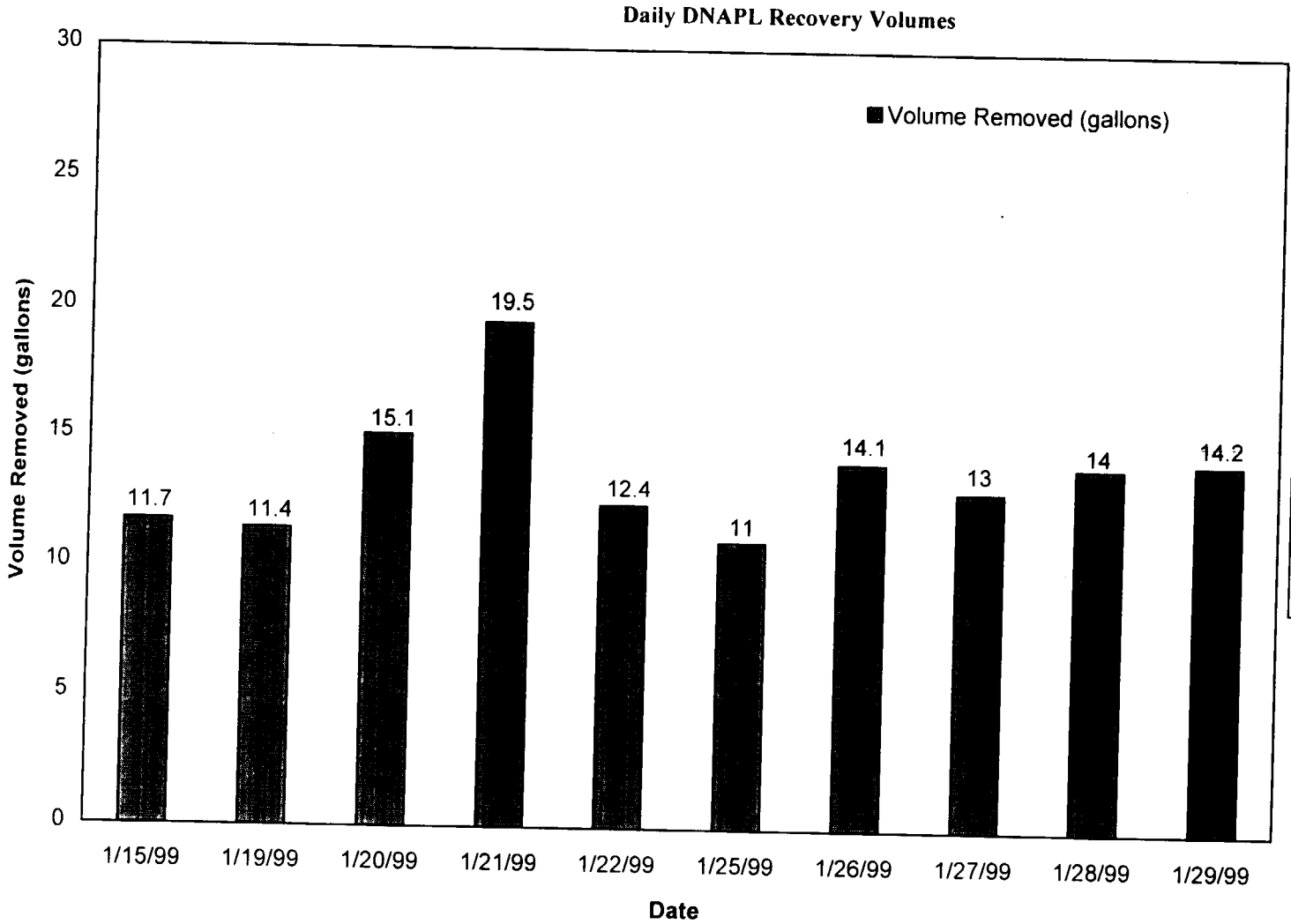
Notes:

1. Data for the 1-hour DNAPL recovery tests were collected by Blasland, Bouck & Lee, Inc. (BBL) and the General Electric Company (GE).
2. Data for the one-day DNAPL recovery test were collected by BBL.

FIGURE 1

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETS

SUMMARY OF 1-HOUR DNAPL RECOVERY TEST - Monitoring Well N2SC-01I



Notes:
1. Data collected by Blasland, Bouck, and Lee, Inc. and General Electric Company.
2. Well was pumped for one hour with the exception of 1/15/99 which was pumped for 45 minutes.
3. DNAPL = Dense Non-Aqueous Phase Liquid.

2/6/99
1999data

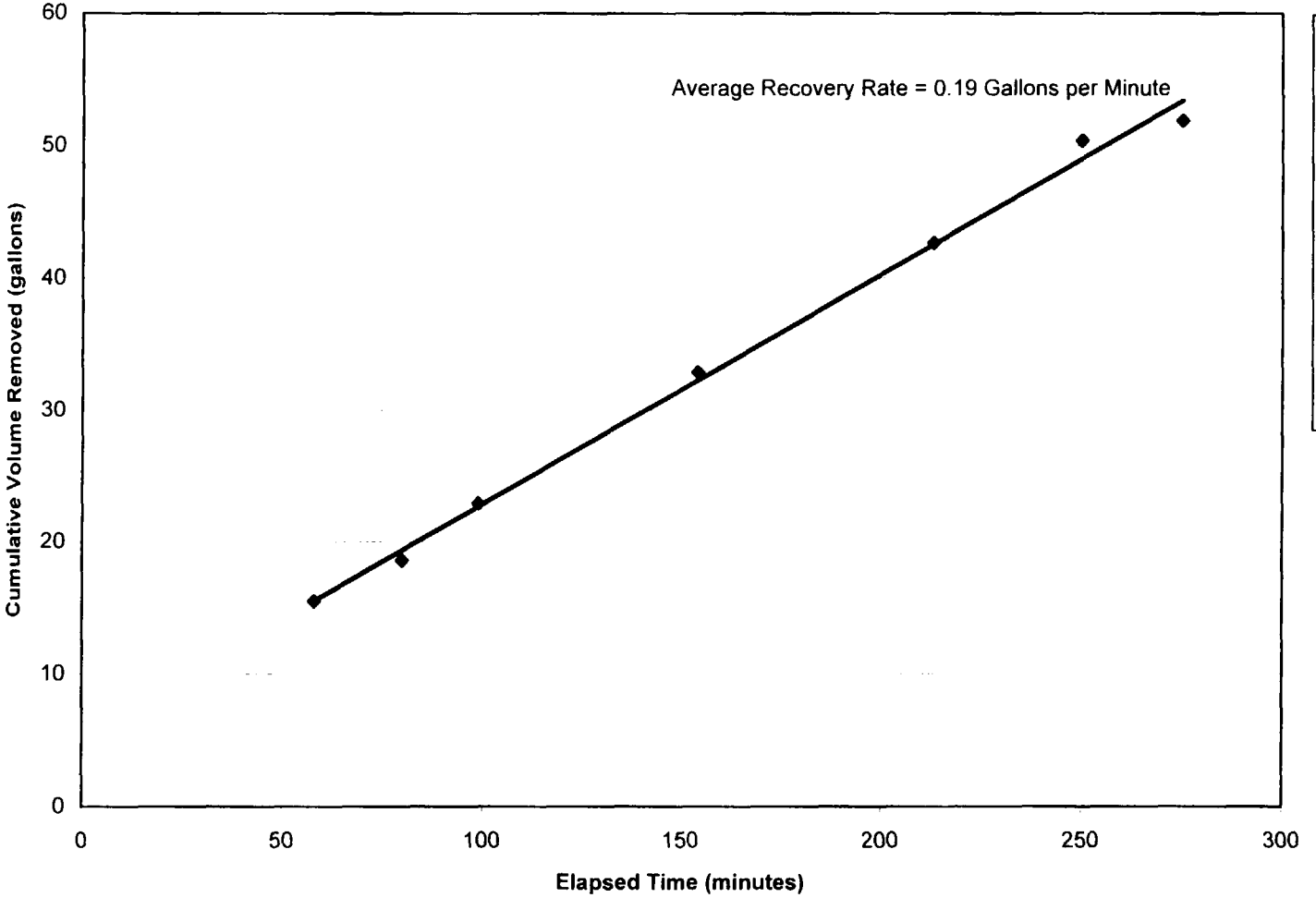
Prepared by Blasland, Bouck, and Lee, Inc.

FIGURE 2

GENERAL ELECTRIC COMPANY
PITTSFIELD, MASSACHUSETS

SUMMARY OF 1-DAY DNAPL RECOVERY TEST - Monitoring Well N2SC-011

DNAPL Volume Removed Over Time



Notes:
1. Data collected by Blasland, Bouck, and Lee, Inc.
2. Well was pumped for approximately 5 hours.
3. DNAPL = Dense Non-Aqueous Phase Liquid.

2/6/99
1999data

Prepared by Blasland, Bouck, and Lee, Inc.