JULY/AUGUST 1999 ADDITIONAL SOURCE CONTROL INVESTIGATIONS, LYMAN STREET SITE

September 9, 1999

HSI GEOTRANS
A TETRA TECH COMPANY
6 Lancaster County Road, Suite Four
Harvard, Massachusetts 01451

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

September 9, 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: Additional Source Control Investigations, Lyman Street Site, US EPA Area 5A/DEP Site Number 1-0856

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

Enclosed please find the document entitled *July/August 1999 Additional Source Control Investigations. Lyman Street Site*. 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 as proposed in the *Source Control Investigation Addendum Report Upper Reach of Housatonic River (First ½ mile)* (HSI GeoTrans, 1999) and pursuant to the EPA July 1, 1999 conditional approval letter.

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

Yours truly,

For

John D. Ciampa
Remediation Project Manager

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cc: S. Acree, EPA*
M. Nalipinski, EPA*
R. Child, DEP*
M. Holland, DEP
J. Bieke, Shea & Gardner *
Mayor G. Doyle
State Representative S. Kelly
State Senator A. Nuciforo
A. Thomas, GE*
M. Carroll, GE
Pittsfield Conservation Commission*
S. Cooke, McDermott, Will & Emery*
J. Bridge, HSI GeoTrans*
Pittsfield Health Department*
Housatonic River Initiative
R. Bell, DEP*
J. Ziegler, DEP*
State Representative D. Bosley
State Representative C. Hodgkins
State Representative P. Larkin
J. Gardner, GE
A. Silfer, GE*
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G. Bibler, Goodwin, Procter & Hoar*
D. Veilleux, Roy F. Weston*
Public Information Repositories
ECL I-P-IV(A)(1)* & (2)
L. Cutler, DEP

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JULY/AUGUST 1999 ADDITIONAL SOURCE CONTROL INVESTIGATIONS, LYMAN STREET SITE

PREPARED FOR:

GENERAL ELECTRIC COMPANY

PREPARED BY:

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

TABLE OF CONTENTS

PAGE

LIST OF TABLES

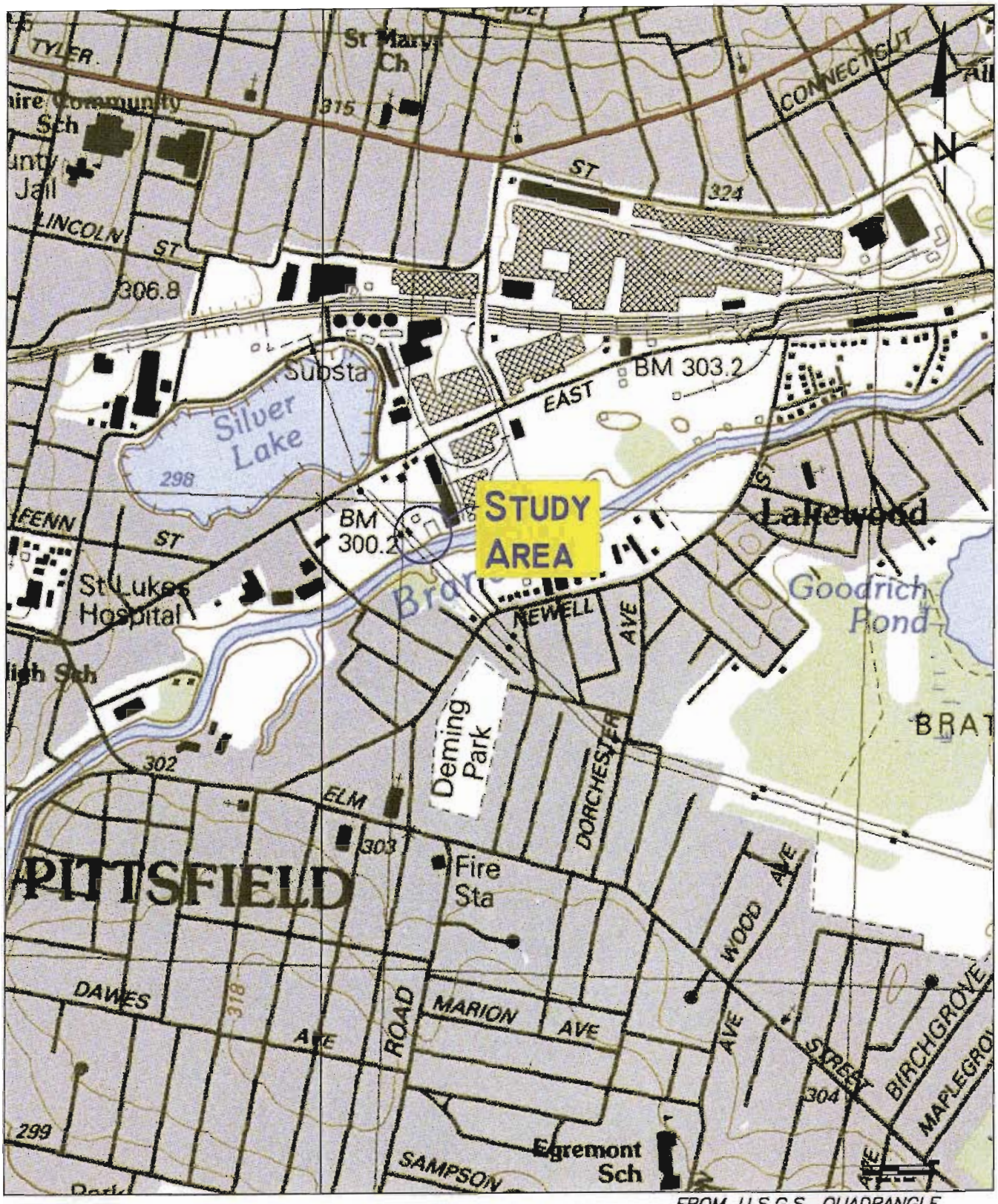
LIST OF FIGURES

PAGE

1 INTRODUCTION

This report describes additional source control investigations performed between July 28 and August 11, 1999 at the General Electric Co., Lyman Street site in Pittsfield, Massachusetts. Figure 1-1 shows the general location of the Lyman Street site. Figure 1-2 shows the locations where additional borings were drilled and wells installed. The additional source control investigations were proposed in the June 15, 1999 Source Control Investigation Addendum Report Upper Reach of Housatonic River (First ½ Mile) (HSI GeoTrans, 1999) to supplement the existing data. The proposed investigations were conditionally approved by EPA in a letter dated July 1, 1999. The purposes of the additional investigations were to further evaluate the extent of light non-aqueous phase liquids (LNAPL), dense non-aqueous phase liquids (DNAPL) and to further define the topography of the till surface at the Lyman Street site. In addition, an assessment of the appropriateness of additional automated or enhanced DNAPL recovery at the site was made.

These investigations were conducted in accordance with the Source Control Work Plan-Upper Reach of Houastonic River (First ½ Mile) (BBL, 1998a) and the Sampling and Analysis Plan/Data Collection and Quality Assurance Plan (BBL, 1998b).



QUADRANGLE LOCATION

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

0 1000
Scale in feet

Contour Interval 3 Meters
National Geodetic Vertical Datum Of 1929

9/9/99

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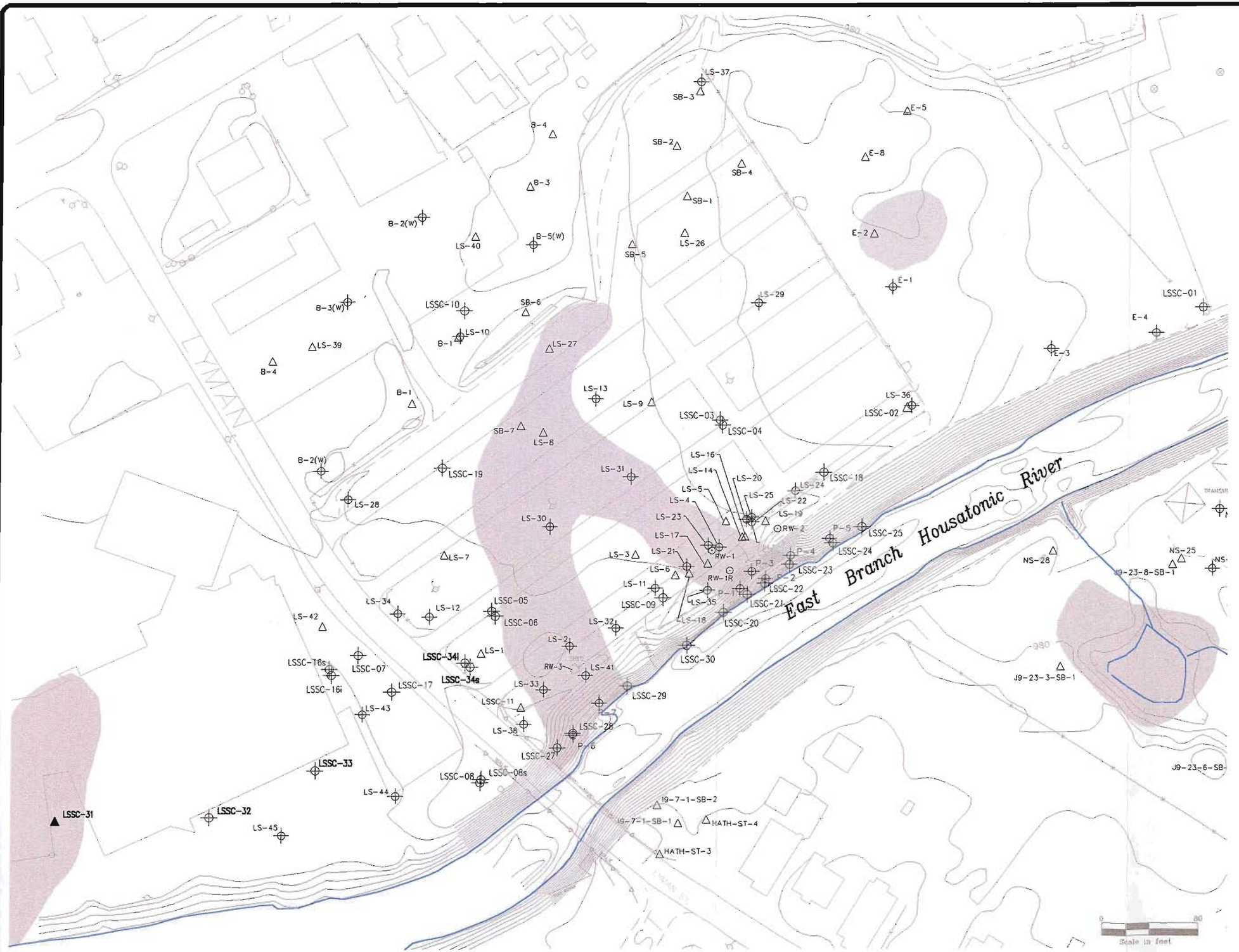
Figure 1-1 Study Area Location Map



EXPLANATION

- APPROXIMATE DELINEATION OF FORMER OXBOW
- ES2-1 — PREVIOUSLY INSTALLED MONITORING WELL
- 64X(W) — PREVIOUSLY INSTALLED OIL RECOVERY CAISSON
- RW-1(X) — PREVIOUSLY INSTALLED PUMPING WELL
- X-11 — PREVIOUSLY INSTALLED SOIL BORING
- WP-3 — PREVIOUSLY INSTALLED PIEZOMETER
- LSSC-18 — NEWLY INSTALLED SOURCE CONTROL MONITORING WELL
- LSSC-31 — NEWLY INSTALLED SOURCE CONTROL SOIL BORING

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.

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Figure 1-2 Lyman Street Site Well and Boring Location Map, Revised 7/30/99

2 BORING AND WELL INSTALLATION

As part of these additional source control investigations, five borings (LSSC-31, LSSC-32, LSSC-33, LSSC-34S, and LSSC-34I), were drilled to collect additional samples of the unconsolidated deposits underlying the Lyman Street site and an adjacent property at 10 Lyman Street. With the exception of boring LSSC-31, monitoring wells were installed in all of the borings. The borings were drilled by the hollow stem auger method. 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 potential 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 done by Roy F. Weston personnel, on behalf of EPA. The boring logs and well construction details for the newly installed wells are included in Appendix A.

As indicated in Table 2-1, five composite soil samples were collected for PCB analysis from the upper 15 feet in boring LSSC-31. One discrete sample for VOC analysis was also collected from the five to six foot interval of boring LSSC-31, while one composite sample was collected from the six to ten foot interval for Appendix IX + 3 analyses. The interval sampled for VOC analysis was that which had the highest field-screening PID reading. In order to be consistent with updated EPA sampling methodologies and the draft revisions to the Sampling and Analysis Plan (BBL, 1998b), all soil samples for VOC analysis were placed directly into Encore® sample containers. This allowed the samples to be extracted and analyzed utilizing the new EPA method 5035. The composite sample for Appendix IX + 3 analyses was selected from the composite interval which contained the highest field screening PID reading.

As approved by EPA, samples for PCB analyses were not collected from the upper 15 feet in borings LSSC-32, LSSC-33, and LSSC-34 since comparable data were available from other nearby borings. In all borings that extended to the till surface, however, one sample was collected for PCB analysis from the unconsolidated deposits directly above the till surface. In addition, at boring LSSC-34I, field personnel observed indications of DNAPL within the interval of 24 to 28 feet. Accordingly a sample from this interval was collected for Appendix IX+3 analysis.

Three of the borings (LSSC-31, LSSC-32 and LSSC-33) were drilled along the south side of the building on the 10 Lyman Street property to evaluate the top of till elevation in this area and to investigate the potential presence of DNAPL. Monitoring wells were installed in borings LSSC-32 and LSSC-33. Boring location LSSC-34 is in the southwestern portion of the GE Lyman Street parking lot adjacent to Lyman Street. Two wells, LSSC-34S and LSSC-34I were installed at this location to further evaluate the western extent of any LNAPL and DNAPL detected in the parking lot. The locations of the new wells and the previously installed wells are shown on Figure 1-2. Boring logs and well construction diagrams are included in Appendix A.

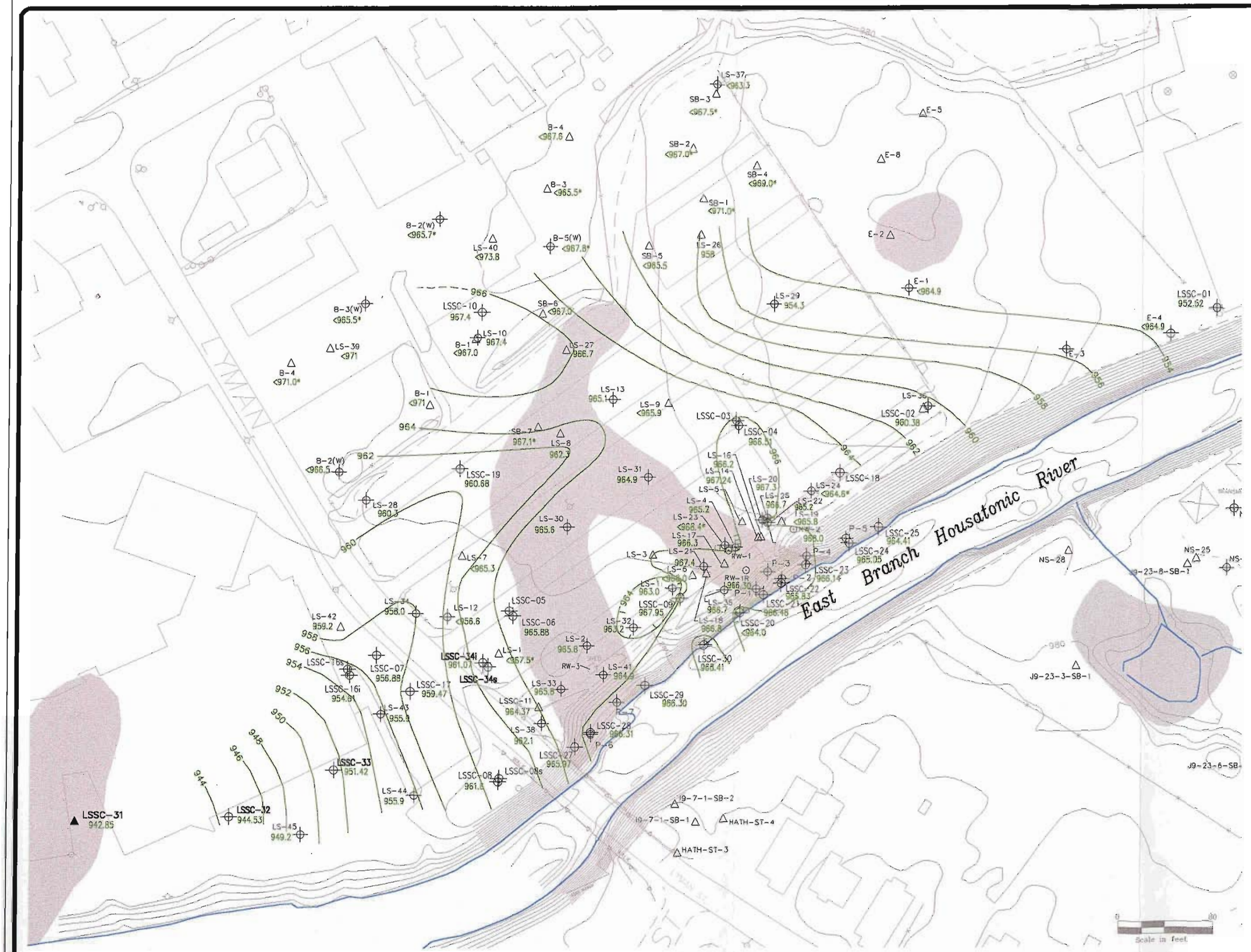
The unconsolidated deposits encountered in the newly installed wells are similar to those previously observed beneath the Lyman Street site. The Lyman Street site is underlain by fill and fluvial deposits which overlie a basal till. The fill ranges in thickness from 0 to 20 feet. The underlying fluvial 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 overlie a relatively dense silt and silty sand deposit which is interpreted to be till. Based on previous investigations, the thickness of the till layer ranges from 22 feet at boring LSSC-02 to more than 41 feet at boring LSSC-11.

As indicated by numerous borings in the vicinity of the Lyman Street parking lot, the relatively dense till layer is continuous beneath the site. Figure 2-1 is a revised contour map

of the top of the till elevation. The map is based on data from the existing borings/wells and the newly installed borings/wells. The top of the till surface is highest in the central portion of the site and slopes to the northeast and southwest. There appears to be a well defined trough in the top of till surface that begins near borings LS-8 and SB-7 and slopes southwesterly towards monitoring wells LSSC-07 and LSSC-16I. Top of till elevation data from the new borings on the 10 Lyman Street property indicate that a well-defined trough shown between boring LS-8 and well LSSC-07 apparently flattens out to the west of LSSC-07. The till surface continues to slope in a westerly direction towards borings LSSC-31 and LSSC-32.

Table 2-1. Soil samples collected and analyses performed

BORING	SAMPLE	SAMPLE DEPTH (FEET)	ANALYSES
LSSC-31	CS01	0 to 1	PCB
LSSC-31	CS0103	1 to 3	PCB
LSSC-31	CS0306	3 to 6	PCB
LSSC-31	SS04	5 to 6	VOC
LSSC-31	CS0610	6 to 10	PCB and Appendix IX +3
LSSC-31	CS1015	10 to 15	PCB
LSSC-31	SS3638	36 to 38	PCB
LSSC-32	SS18	34-36	PCB
LSSC-33	SS2830	28-30	PCB
LSSC-34	CS2428	24 to 28	PCB and Appendix IX +3
LSSC-34	SS13	24 to 26	VOC



EXPLANATION

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- WP-3 — PREVIOUSLY INSTALLED PIEZOMETER
- LSSC-18 — NEWLY INSTALLED SOURCE CONTROL MONITORING WELL
- LSSC-31 — NEWLY INSTALLED SOURCE CONTROL SOIL BORING
- 961.2 — TOP OF TILL ELEVATION
- 946 — TOP OF TILL CONTOUR 1 FOOT INTERVAL
- * — APPROX. TOP OF TILL ELEVATION

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.

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Figure 2-1 Lyman Street Site Top of Till Elevation Contour Map, Revised 7/30/99

3 RESULTS OF CHEMICAL ANALYSES

As described in Section 2 of this report, selected samples of the unconsolidated deposits were collected for PCB, VOC and Appendix IX + 3 analyses.

The data from new boring LSSC-31 on the 10 Lyman Street property shows that there are low concentrations of PCBs (0.046 mg/kg to 11.3 mg/kg) in the upper 15 feet of the unconsolidated deposits. In the unconsolidated deposits just above the till layer beneath the 10 Lyman Street property, no PCBs were detected at borings LSSC-32 and LSSC-33 and only a very low PCB concentration of 0.057 mg/kg was detected in the sample collected in boring LSSC-31. The areal distribution of soil PCB concentrations based on the 1998 and 1999 Source Control borings and monitoring wells is shown on Figure 3-1.

Low concentrations (less than 10 mg/kg) of several polynuclear aromatic hydrocarbons were also detected in the composite sample collected between six and ten feet from boring LSSC-31. Bis (2-Ethylhexyl) phthalate was the only SVOC detected (at 0.3 mg/kg) in the Appendix IX + 3 sample from boring LSSC-34. Two VOCs were detected at very low concentrations. Acetone was detected at 0.045 mg/kg in the sample from the five to six foot interval in boring LSSC-31 and at 0.0053 mg/kg in the sample from the 24 to 26 foot interval in boring LSSC-34. Methylene chloride was also detected at 0.0028 mg/kg in the 24 to 26 foot sample from boring LSSC-34. Several dioxins and dibenzofurans were detected at low concentrations ranging from 0.0013 μg/kg to 0.15 μg/kg in the samples from LSSC-31 and LSSC-34. Additionally, low concentrations of metals were detected in the samples from LSSC-31 and LSSC-34 analyzed for Appendix IX + 3 constituents. All metals concentrations were below the Massachusetts Contingency Plan Method 1, soil categories S-2 and S-3 standards. The concentrations of detected analytes are summarized in Tables 3-1 through 3-5.

Table 3-1. Soil PCB Concentration Data

Location	Sample Name	Sample Depth (feet)	Compound	Result	Qualifier	Modifier	Units
LSSC-31							
	CS01	0-1					
			Aroclor 1016	ND			mg/kg
			Aroclor 1221	ND			mg/kg
			Aroclor 1232	ND			mg/kg
			Aroclor 1242	ND			mg/kg
			Aroclor 1248	ND			mg/kg
			Aroclor 1254	0.046			mg/kg
			Aroclor 1260	ND			mg/kg
			Total PCBs	**0.046**			
	CS0103	1-3					
			Aroclor 1016	ND			mg/kg
			Aroclor 1221	ND			mg/kg
			Aroclor 1232	ND			mg/kg
			Aroclor 1242	ND			mg/kg
			Aroclor 1248	ND			mg/kg
			Aroclor 1254	1.4			mg/kg
			Aroclor 1260	1.5			mg/kg
			Total PCBs	**2.9**			
	CS0306	3-6					
			Aroclor 1016	ND			mg/kg
			Aroclor 1221	ND			mg/kg
			Aroclor 1232	ND			mg/kg
			Aroclor 1242	ND			mg/kg
			Aroclor 1248	ND			mg/kg
			Aroclor 1254	7.4			mg/kg
			Aroclor 1260	3.9			mg/kg
			Total PCBs	**11.3**			

Table 3-1. (continued)

Location	Sample Name	Sample Depth (feet)	Compound	Result	Qualifier	Modifier	Units
	CS0610	6-10					
			Aroclor 1016	ND			mg/kg
			Aroclor 1221	ND			mg/kg
			Aroclor 1232	ND			mg/kg
			Aroclor 1242	ND			mg/kg
			Aroclor 1248	ND			mg/kg
			Aroclor 1254	1.4			mg/kg
			Aroclor 1260	1			mg/kg
			Total PCBs	**2.4**			
	CS1015	10-15					
			Aroclor 1016	ND			mg/kg
			Aroclor 1221	ND			mg/kg
			Aroclor 1232	ND			mg/kg
			Aroclor 1242	ND			mg/kg
			Aroclor 1248	ND			mg/kg
			Aroclor 1254	ND			mg/kg
			Aroclor 1260	ND			mg/kg
			Total PCBs	**0**			
	SS3638	36-38					
			Aroclor 1016	ND			mg/kg
			Aroclor 1221	ND			mg/kg
			Aroclor 1232	ND			mg/kg
			Aroclor 1242	ND			mg/kg
			Aroclor 1248	ND			mg/kg
			Aroclor 1254	0.057			mg/kg
			Aroclor 1260	ND			mg/kg
			Total PCBs	**0.057**			
LSSC-32							
	SS18	34-36					
			Aroclor 1016	ND			mg/kg
			Aroclor 1221	ND			mg/kg
			Aroclor 1232	ND			mg/kg
			Aroclor 1242	ND			mg/kg
			Aroclor 1248	ND			mg/kg
			Aroclor 1254	ND			mg/kg
			Aroclor 1260	ND			mg/kg
			Total PCBs	**0**			

Table 3-1. (continued)

Location	Sample Name	Sample Depth (feet)	Compound	Result	Qualifier	Modifier	Units
LSSC-33							
	SS2830	28-30					
			Aroclor 1016	ND			mg/kg
			Aroclor 1221	ND			mg/kg
			Aroclor 1232	ND			mg/kg
			Aroclor 1242	ND			mg/kg
			Aroclor 1248	ND			mg/kg
			Aroclor 1254	ND			mg/kg
			Aroclor 1260	ND			mg/kg
			Total PCBs	**0**			
LSSC-34I							
	CS2428	24-28					
			Aroclor 1016	ND			mg/kg
			Aroclor 1221	ND			mg/kg
			Aroclor 1232	ND			mg/kg
			Aroclor 1242	ND			mg/kg
			Aroclor 1248	ND			mg/kg
			Aroclor 1254	6			mg/kg
			Aroclor 1260	ND			mg/kg
			Total PCBs	**6**			

Qualifier

ND *Not Detected*

J *Result is between MDL and RL.*

Table 3-2. Detected Soil VOC Concentration Data

Location	Sample Name	Sample Depth (feet)	Compound	Result	Qualifier	Modifier	Units
LSSC-31							
	SS04	5-6					
			Acetone	0.045			mg/kg
LSSC-341							
	SS13	24-26					
			Acetone	0.0053	J		mg/kg
			Methylene chloride	0.0028	J		mg/kg

Qualifier

J *Result is between MDL and RL.*

E *Result exceeds calibration range.*

Table 3-3. Detected Soil SVOC Concentration Data

Location	Sample Name	Sample Depth (feet)	Compound	Result	Qualifier	Modifier	Units
LSSC-31							
	CS0610	6-10					
			Acenaphthylene	2.5			mg/kg
			Anthracene	1.1	J		mg/kg
			Benzo(a)anthracene	6.2			mg/kg
			Benzo(a)pyrene	10			mg/kg
			Benzo(b)fluoranthene	5.1			mg/kg
			Benzo(ghi)perylene	4.8			mg/kg
			Benzo(k)fluoranthene	5.1			mg/kg
			Chrysene	7.2			mg/kg
			Dibenz(a,h)anthracene	1.4	J		mg/kg
			Fluoranthene	8.5			mg/kg
			Indeno(1,2,3-cd)pyrene	4.3			mg/kg
			Phenanthrene	4.8			mg/kg
			Pyrene	14			mg/kg
LSSC-34I							
	CS2428	24-28					
			bis(2-Ethylhexyl) phthalate	0.3	J		mg/kg

Qualifier

J *Result is between MDL and RL.*

E *Result exceeds calibration range.*

Table 3-4. Detected Soil Dioxin and Dibenzofuran Concentrations Data

Location	Sample Name	Sample Depth (feet)	Compound	Result	Qualifier	Modifier	Units
LSSC-31							
	CS0610	6-10					
			1,2,3,4,6,7,8-HpCDD	0.0064	J		µg/kg
			1,2,3,4,6,7,8-HpCDF	0.037			µg/kg
			1,2,3,4,7,8,9-HpCDF	0.0079			µg/kg
			1,2,3,4,7,8-HxCDF	0.025			µg/kg
			1,2,3,6,7,8-HxCDF	0.017			µg/kg
			1,2,3,7,8-PeCDF	0.015			µg/kg
			2,3,4,6,7,8-HxCDF	0.0067	J		µg/kg
			2,3,4,7,8-PeCDF	0.016			µg/kg
			2,3,7,8-TCDF	0.035	g		µg/kg
			OCDD	0.02			µg/kg
			OCDF	0.041			µg/kg
			TOTAL HpCDD	0.012			µg/kg
			TOTAL HpCDF	0.059			µg/kg
			TOTAL HxCDF	0.11			µg/kg
			TOTAL PeCDF	0.15			µg/kg
			TOTAL TCDD	0.0094			µg/kg
			TOTAL TCDF	0.3			µg/kg
LSSC-34I							
	CS2428	24-28					
			1,2,3,4,6,7,8-HpCDF	0.0079			µg/kg
			1,2,3,4,7,8,9-HpCDF	0.0071			µg/kg
			1,2,3,4,7,8-HxCDF	0.021			µg/kg
			1,2,3,6,7,8-HxCDF	0.0089			µg/kg
			2,3,4,7,8-PeCDF	0.0038	J		µg/kg
			OCDD	0.016			µg/kg
			OCDF	0.01	J		µg/kg
			TOTAL HpCDF	0.022			µg/kg
			TOTAL HxCDF	0.054			µg/kg
			TOTAL PeCDF	0.034			µg/kg
			TOTAL TCDD	0.0013			µg/kg
			TOTAL TCDF	0.081			µg/kg

Table 3-4. (continued)

Location	Sample Name	Sample Depth (feet)	Compound	Result	Qualifier	Modifier	Units

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 3-5. Detected Soil Metals Concentration Data

Location	Sample Name	Sample Depth (feet)	Compound	Result	Qualifier	Modifier	Units
LSSC-31							
	CS0610	6-10					
			Antimony	0.78	B		mg/kg
			Arsenic	5.9			mg/kg
			Barium	64.7			mg/kg
			Beryllium	0.41	B		mg/kg
			Cadmium	0.73	B		mg/kg
			Chromium	45.1			mg/kg
			Cobalt	11			mg/kg
			Copper	98.8			mg/kg
			Lead	137			mg/kg
			Mercury	0.53			mg/kg
			Nickel	19.1			mg/kg
			Selenium	1.1			mg/kg
			Silver	0.27	B		mg/kg
			Thallium	0.56	B		mg/kg
			Tin	13.3	B		mg/kg
			Vanadium	13.4			mg/kg
			Zinc	239			mg/kg
LSSC-34I							
	CS2428	24-28					
			Arsenic	4.9			mg/kg
			Barium	19	B		mg/kg
			Beryllium	0.27	B		mg/kg
			Cadmium	0.69			mg/kg
			Chromium	7.7			mg/kg
			Cobalt	8.8			mg/kg
			Copper	14.2			mg/kg
			Lead	6.8			mg/kg
			Mercury	0.017	B		mg/kg
			Nickel	16.5			mg/kg
			Silver	0.097	B		mg/kg
			Vanadium	7.2			mg/kg
			Zinc	90.4			mg/kg

Table 3-5. (continued)

Location	Sample Name	Sample Depth (feet)	Compound	Result	Qualifier	Modifier	Units

Qualifier

B *Result is between MDL and RL*

! *Result is between MDL and LOQ*

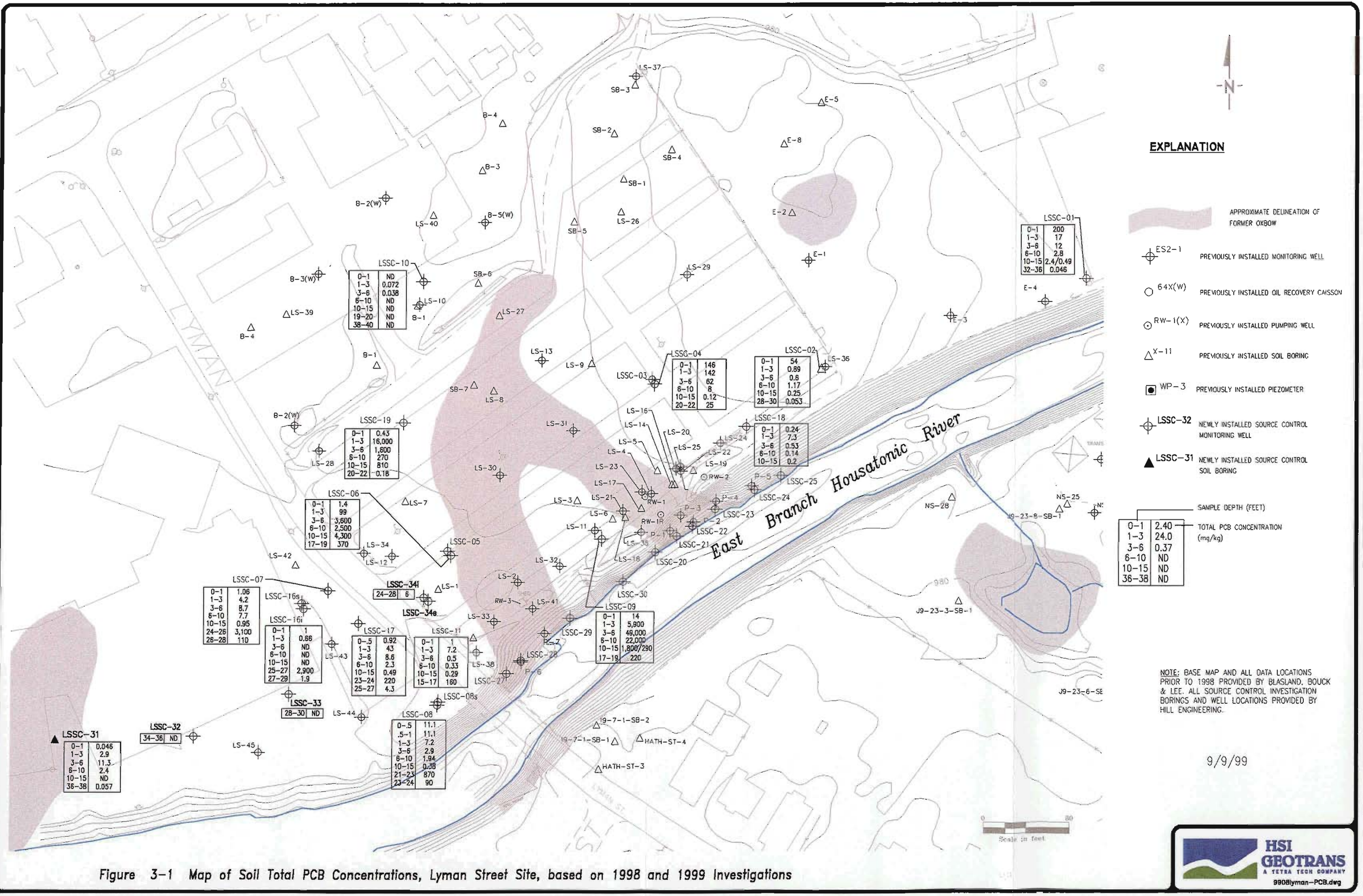


Figure 3-1 Map of Soil Total PCB Concentrations, Lyman Street Site, based on 1998 and 1999 Investigations

4 NAPL EVALUATIONS

NAPL at the site is currently subject to ongoing source control activities. These activities include the operation of several automated groundwater/NAPL recovery systems, weekly/monthly well monitoring and manual NAPL removal. In addition, a proposal for a supplemental sheetpile containment barrier to be installed along the base of the riverbank was recently submitted to the regulatory agencies (Blasland, Bouck & Lee, July 1999). This proposal was conditionally approved in an August 27, 1999 letter from EPA.

The following sections summarize the extent of NAPL at Lyman Street and the results of the DNAPL recovery tests.

4.1 LNAPL AND DNAPL EXTENT

LNAPL at the site is currently subject to ongoing remediation by three automated groundwater/NAPL recovery systems and a manual removal program. To assess these efforts, GE regularly monitors more than 40 wells at the site as part of ongoing monitoring activities. These data are reported in monthly reports for the site and are summarized in annual short-term measure effectiveness reports, which have been submitted since 1993. In addition, 36 borings/wells have been installed since December 1998 to further assess subsurface stratigraphy and NAPL extent, as part of additional source control investigation/remediation activities.

The most recent investigation activities included three additional borings/wells on the 10 Lyman Street Property (LSSC-31, -32 and -33) and two borings/wells along the southwestern edge of the Lyman Street parking lot (LSSC-34S and -34I). No indications of LNAPL or DNAPL have been observed in any of the newly installed borings/wells on the 10 Lyman Street properties. The only new well installed in which there was an indication of NAPL was LSSC-34I, where indications of DNAPL were observed in the soil samples collected from the interval of 24 to 28 feet. Subsequent water level and NAPL measurements

in LSSC-34I have also indicated the presence of DNAPL. Table 4-1 summarizes the results of monitoring activities at the newly installed source control wells. Figures 4-1 and 4-2 show the areal distribution of DNAPL and LNAPL at the Lyman Street site and the adjacent 10 Lyman Street properties.

4.2 ONGOING DNAPL RECOVERY EFFORTS

Automated pumping systems are currently operating at three extraction wells at the Lyman Street Site (RW-1/1R, RW-2, and RW-3). The initial automated collection activities started operation in 1992, as part of a short term measure. Although these systems are primarily focused on LNAPL recovery, DNAPL is also recovered from the RW-1/1R system. The amount of DNAPL removed from extraction well RW-1 has diminished every year from a high of 215 gallons, collected during the first year in operation to 11 gallons in its seventh full year of operation (August 1998-July 1999 Assessment Period).

In addition, manual recovery of DNAPL from monitoring wells has been conducted on a weekly basis when the DNAPL thickness exceeds 1.0 foot, in a given well. These efforts recovered a maximum amount of DNAPL during the 1995/1996 assessment period when approximately 40 gallons were recovered. During the most recent assessment period (August 1998-July 1999) approximately 25 gallons of DNAPL have been manually recovered. The majority of the DNAPL has been collected from wells LS-30, LS-31 and LS-34.

4.3 DNAPL RECOVERY TESTS

Between August 9 and August 11, 1999, DNAPL recovery tests were conducted in wells LS-34, LSSC-07 and LSSC-16I. These wells were selected for testing because they are located at the downslope edge of the DNAPL zone. Initially, DNAPL was monitored and removed, if possible, from the wells approximately hourly. However, the frequency of collection was adjusted during the tests based on the observed DNAPL recovery rate. The testing procedure involved periodically removing DNAPL (if the thickness exceeded

0.01feet) from the wells and determining how quickly the DNAPL recovered . The test indicated that DNAPL recovery to wells LS-34 and LSSC-16I is quite slow. Approximately 380 ml of DNAPL were recovered on August 9, 10 ml wwere recovered on August 10, and 30 ml on August 11 from well LS-34. Well LSSC-16I yielded 320 ml of DNAPL on August 9, 15 ml on August 10 and no DNAPL could be recovered on August 11. Well LSSC-07 yielded more DNAPL than wells LS-34 or LSSC-16I and recharged more quickly. On August 9, approximately 1,820 ml of DNAPL were recovered, on August 10, approximately 1,085 ml were recovered, and on August 11 approximately 470 ml were recovered. Tables 4-2, 4-3 and 4-4 summarize the DNAPL recovery tests for wells LSSC-07, LSSC-16I and LS-34. Figure 4-3 is a DNAPL recovery graph for the three- day test performed in well LSSC-07.

DNAPL levels in monitoring wells LS-34, LSSC-07 and LSSC-16I are currently monitored weekly. DNAPL is removed from the wells when the thickness reaches one foot. Current weekly DNAPL monitoring of well LS-34 indicates that approximately two to four weeks are required for DNAPL to recover to a thickness of 1 foot in the well. Less than one week is required for the DNAPL in LSSC-07 to recover to a thickness of one foot. Well LSSC-16I has the slowest recovery rate taking approximately six weeks to recover to a thickness of one foot. The weekly monitoring data for 1999 are included in Table 4-1.

Table 4-1. Water Level and NAPL Measurements, Lyman Street Site

Location	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
LS-34									
	1/7/99	985.79		14.21	971.58		27.25	958.54	
	1/14/99	985.79		14.03	971.76		28.10	957.69	
	1/21/99	985.79		13.32	972.47		27.73	958.06	
	1/28/99	985.79		12.99	972.80		27.28	958.51	
	2/4/99	985.79		12.45	973.34		27.98	957.81	
	2/11/99	985.79		13.24	972.55		27.73	958.06	
	2/18/99	985.79		13.52	972.27		27.43	958.36	
	2/25/99	985.79		13.71	972.08		28.30	957.49	
	3/4/99	985.79		11.59	974.20		27.98	957.81	
	3/11/99	985.79		13.30	972.49		27.60	958.19	
	3/18/99	985.79		13.20	972.59		27.44	958.35	
	3/25/99	985.79		12.15	973.64		27.92	957.87	
	4/1/99	985.79		12.24	973.55		27.69	958.10	
	4/8/99	985.79		12.90	972.89		27.56	958.23	
	4/15/99	985.79		13.41	972.38		27.22	958.57	
	4/22/99	985.79		13.59	972.20		28.02	957.77	
	4/28/99	985.79		13.53	972.26		27.85	957.94	
	5/6/99	985.79		13.12	972.67		27.56	958.23	
	5/13/99	985.79		13.55	972.24		27.38	958.41	
	5/20/99	985.79		11.31	974.48		28.00	957.79	
	5/27/99	985.79		12.80	972.99		27.85	957.94	
	6/3/99	985.79		13.61	972.18		27.72	958.07	
	6/10/99	985.79		14.08	971.71		27.58	958.21	

Table 4-1. (continued)

Location	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
	6/17/99	985.79		14.08	971.71		27.17	958.62	
	6/24/99	985.79		14.31	971.48		28.01	957.78	
	7/1/99	985.79		13.65	972.14		27.80	957.99	
	7/8/99	985.79		13.62	972.17		27.69	958.10	
	7/15/99	985.79		14.04	971.75		27.61	958.18	
	7/22/99	985.79		14.17	971.62		27.17	958.62	
	7/29/99	985.79		14.32	971.47		28.23	957.56	
LSSC-01									
	1/7/99	986.82		15.81	971.14				
	1/22/99	986.82		14.80	972.15				
	1/29/99	986.82		14.69	972.26				
	2/5/99	986.82		14.17	972.78				
	2/19/99	986.82		14.84	972.11				
	3/11/99	986.82		14.88	972.07				
	3/18/99	986.82		14.73	972.22				
	4/2/99	986.82		13.74	973.21				
	4/6/99	986.82		14.43	972.52				
	4/14/99	986.82		15.12	971.83				
	4/23/99	986.82		15.14	971.81				
	4/30/99	986.82		15.52	971.43				
	5/7/99	986.82		15.10	971.85				
	5/14/99	986.82		15.48	971.47				
	5/27/99	986.82		14.42	972.53				
LSSC-03									
	12/21/98	988.83		17.23	971.73				
	12/28/98	988.83		17.16	971.80				

Table 4-1. (continued)

Location	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
	1/7/99	988.83		17.25	971.71				
	1/22/99	988.83		16.45	972.51				
	1/29/99	988.83		16.22	972.74				
	2/5/99	988.83		15.82	973.14				
	2/19/99	988.83		16.35	972.61				
	3/5/99	988.83		15.51	973.45				
	3/11/99	988.83		16.31	972.65				
	3/17/99	988.83		16.40	972.56				
	3/24/99	988.83		15.07	973.89				
	4/2/99	988.83		15.39	973.57				
	4/6/99	988.83		15.80	973.16				
	4/14/99	988.83		16.42	972.54				
	4/23/99	988.83		16.52	972.44				
	4/30/99	988.83		16.63	972.33				
	5/7/99	988.83		16.45	972.51				
	5/14/99	988.83		16.68	972.28				
	5/21/99	988.83		15.20	973.76				
	5/27/99	988.83		15.87	973.09				
LSSC-04									
	12/17/98	988.77		17.21	971.69				
	12/21/98	988.77		17.21	971.69				
	12/28/98	988.77		17.15	971.75				
	1/7/99	988.77		17.22	971.68				
	1/22/99	988.77		16.42	972.48				
	1/29/99	988.77		16.20	972.70				
	2/5/99	988.77		15.80	973.10				

Table 4-1. (continued)

Location	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
	2/19/99	988.77		16.32	972.58				
	3/5/99	988.77		15.47	973.43				
	3/11/99	988.77		16.26	972.64				
	3/17/99	988.77		16.39	972.51				
	3/24/99	988.77		15.05	973.85				
	4/2/99	988.77		15.35	973.55				
	4/6/99	988.77		15.79	973.11				
	4/14/99	988.77		16.40	972.50				
	4/23/99	988.77		16.52	972.38				
	4/30/99	988.77		16.61	972.29				
	5/7/99	988.77		16.42	972.48				
	5/14/99	988.77		16.63	972.27				
	5/21/99	988.77		15.17	973.73				
	5/27/99	988.77		15.86	973.04				
LSSC-05									
	12/17/98	984.74		13.61	971.26				trace NAPL on probe
	12/21/98	984.74		13.60	971.27				sheen on probe
	12/28/98	984.74		13.55	971.32				
	1/7/99	984.74		13.62	971.25				
	1/22/99	984.74		12.79	972.08				
	1/29/99	984.74		12.62	972.25				
	2/5/99	984.74		12.22	972.65				
	2/19/99	984.74		12.79	972.08				
	3/5/99	984.74		11.90	972.97				
	3/11/99	984.74		12.74	972.13				
	3/17/99	984.74		12.84	972.03				

Table 4-1. (continued)

Location	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
	3/24/99	984.74		11.46	973.41				
	4/2/99	984.74		11.76	973.11				
	4/6/99	984.74		12.23	972.64				
	4/14/99	984.74		12.86	972.01				
	4/23/99	984.74		12.94	971.93				
	4/30/99	984.74		13.05	971.82				
	5/7/99	984.74		12.86	972.01				NAPL on probe
	5/14/99	984.74		12.90	971.97				
	5/21/99	984.74		11.54	973.33				
	5/27/99	984.74	12.25	12.30	972.57	0.05			
LSSC-06									
	12/17/98	984.91		13.82	971.22				
	12/21/98	984.91		13.00	972.04				
	12/28/98	984.91		13.75	971.29				
	1/7/99	984.91		13.82	971.22				
	1/22/99	984.91		13.98	971.06				NAPL on probe
	1/29/99	984.91		12.83	972.21				
	2/5/99	984.91		12.43	972.61				1.5' NAPL on probe
	2/19/99	984.91	12.95	13.37	971.67	0.42			
	3/5/99	984.91	12.11	12.20	972.84	0.09			
	3/11/99	984.91	12.91	13.15	971.89	0.24			
	3/17/99	984.91	13.00	13.81	971.23	0.81			
	3/24/99	984.91	11.65	11.91	973.13	0.26			
	4/2/99	984.91	11.91	12.29	972.75	0.38			
	4/6/99	984.91	12.41	12.90	972.14	0.49			
	4/14/99	984.91	13.01	13.77	971.27	0.76			

Table 4-1. (continued)

Location	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
	4/23/99	984.91	13.08	13.85	971.19	0.77			
	4/30/99	984.91	13.19	14.04	971.00	0.85			
	5/7/99	984.91	13.01	13.50	971.54	0.49			
	5/14/99	984.91	13.05	13.51	971.53	0.46			
	5/21/99	984.91	11.78	11.91	973.13	0.13			
	5/27/99	984.91	12.41	13.05	971.99	0.64			
	7/1/99	984.91	13.19	13.92	970.99	0.73			
	8/5/99	984.91	13.90	14.73	970.18	0.83			
LSSC-07									
	1/7/99	982.48		11.07	971.54		23.36	959.25	
	1/22/99	982.48		10.31	972.30				2' NAPL on probe
	1/29/99	982.48		10.13	972.48		23.22	959.39	
	2/5/99	982.48		9.74	972.87		22.98	959.63	
	2/18/99	982.48		10.30	972.31		23.96	958.52	
	2/19/99	982.48		10.31	972.30		22.27	960.34	flush mount full of ice
	2/25/99	982.48		10.72	971.89		22.90	959.58	
	3/4/99	982.48		8.10	974.51		22.75	959.73	
	3/5/99	982.48		9.42	973.19		23.79	958.82	NAPL pumped 3/4/99
	3/11/99	982.48		10.19	972.42		23.09	959.39	
	3/11/99	982.48		10.26	972.35		22.41	960.20	
	3/17/99	982.48		10.33	972.28		23.45	959.16	
	3/18/99	982.48		10.13	972.48		23.09	959.39	
	3/24/99	982.48		9.02	973.59		22.43	960.18	
	3/25/99	982.48		9.05	973.56		23.37	959.11	
	4/1/99	982.48		9.11	973.50		23.20	959.28	
	4/2/99	982.48		9.30	973.31		23.46	959.15	

Table 4-1. (continued)

Location	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
	4/6/99	982.48		9.79	972.82		23.50	959.11	
	4/8/99	982.48		9.91	972.70		23.32	959.16	
	4/15/99	982.48		10.37	972.24		23.30	959.18	
	4/22/99	982.48		10.52	972.09		23.28	959.20	
	4/28/99	982.48		10.47	972.14		23.32	959.16	
	4/30/99	982.48		10.65	971.96		23.55	959.06	
	5/6/99	982.48		10.10	972.51		23.35	959.13	
	5/7/99	982.48	10.41	10.42	972.19	0.01	23.58	959.03	LNAPL measurement suspect; well screen does not cross water table
	5/13/99	982.48		10.53	972.08		23.35	959.13	
	5/14/99	982.48		10.71	971.90		23.96	958.65	
	5/20/99	982.48		7.80	974.81		23.05	959.43	
	5/21/99	982.48		8.74	973.87		24.01	958.60	
	5/27/99	982.48		9.76	972.85		23.29	959.19	
	5/27/99	982.48		9.86	972.75		24.75	957.86	
	6/3/99	982.48		10.61	972.00		23.22	959.26	
	6/10/99	982.48		10.85	971.76		23.35	959.13	
	6/17/99	982.48		11.04	971.57		23.33	959.15	
	6/24/99	982.48		11.15	971.46		23.25	959.23	
	7/1/99	982.48		10.60	972.01		23.26	959.22	
	7/8/99	982.48		10.64	971.84		23.41	959.07	
	7/15/99	982.48		11.01	971.60		23.58	958.90	
	7/22/99	982.48		11.11	971.50		23.65	958.83	
	7/29/99	982.48		11.29	971.32		23.75	958.73	
	8/5/99	982.48		11.33	971.28		23.44	959.04	

Table 4-1. (continued)

Location	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
	8/12/99	982.48		11.33	971.28		24.64	957.84	
	8/18/99	982.48		11.13	971.48		23.55	958.93	
LSSC-08									
	12/21/98	983.13		12.41	970.85				
	12/28/98	983.13		12.40	970.86				
	1/7/99	983.13		12.41	970.85				
	1/22/99	983.13		11.46	971.80				
	1/29/99	983.13		11.43	971.83				
	2/5/99	983.13		10.96	972.30				
	2/19/99	983.13		11.59	971.67				
	3/5/99	983.13		10.41	972.85				
	3/11/99	983.13		11.62	971.64				
	3/17/99	983.13		11.69	971.57				
	3/24/99	983.13		10.29	972.97				
	4/2/99	983.13		10.52	972.74				
	4/6/99	983.13		11.20	972.06				
	4/14/99	983.13		11.85	971.41				
	4/23/99	983.13		11.84	971.42				
	4/30/99	983.13		11.98	971.28				
	5/7/99	983.13		11.77	971.49				
	5/14/99	983.13		12.09	971.17				
	5/21/99	983.13		10.24	973.02				
	5/27/99	983.13		11.18	972.08				
	6/17/99	983.13		12.47	970.77				
LSSC-08S									
	4/2/99	983.11		10.49	972.75				not developed

Table 4-1. (continued)

Location	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
	4/5/99	983.11		10.92	972.32				
	4/6/99	983.11		11.12	972.12				not developed
	4/14/99	983.11		11.83	971.41				not developed
	4/23/99	983.11		11.81	971.43				
	4/30/99	983.11		11.97	971.27				
	5/7/99	983.11		11.75	971.49				rusty water
	5/14/99	983.11		12.08	971.16				
	5/21/99	983.11		10.19	973.05				
	5/27/99	983.11		11.15	972.09				
	6/24/99	983.11		12.61	970.63				
	7/1/99	983.11		11.97	971.14				
	7/8/99	983.11		12.07	971.04				
	7/15/99	983.11		12.42	970.69				
	7/22/99	983.11		12.57	970.54				
	7/29/99	983.11		12.61	970.50				
	8/5/99	983.11		12.69	970.42				
	8/12/99	983.11		12.61	970.50				
	8/18/99	983.11		12.47	970.64				
LSSC-09									
	12/17/98	985.06		14.16	971.03				
	12/21/98	985.06		14.20	970.99				
	12/28/98	985.06		14.11	971.08				
	1/7/99	985.06		14.22	970.97				
	1/22/99	985.06		13.58	971.61				
	1/29/99	985.06		13.33	971.86				
	2/5/99	985.06		13.08	972.11				

Table 4-1. (continued)

Location	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
	2/19/99	985.06		13.51	971.68				
	3/5/99	985.06		13.08	972.11				
	3/11/99	985.06		13.46	971.73				
	3/17/99	985.06		13.58	971.61				
	3/24/99	985.06		12.39	972.80				
	4/2/99	985.06		12.69	972.50				
	4/6/99	985.06		12.97	972.22				
	4/14/99	985.06		13.52	971.67				
	4/23/99	985.06		13.65	971.54				
	4/30/99	985.06		13.69	971.50				
	5/7/99	985.06		13.51	971.68				rusty water
	5/14/99	985.06		13.85	971.34				
	5/21/99	985.06		12.53	972.66				
	5/27/99	985.06		12.88	972.31				rusty water
LSSC-10									
	1/7/99	987.05		9.73	977.45				
	1/22/99	987.05		9.26	977.92				
	1/29/99	987.05		8.57	978.61				
	2/5/99	987.05		8.26	978.92				
	2/19/99	987.05		8.36	978.82				
	3/5/99	987.05		8.20	978.98				sheen on probe
	3/11/99	987.05		7.99	979.19				
	3/17/99	987.05		8.04	979.14				
	3/24/99	987.05		7.38	979.80				
	4/2/99	987.05		7.42	979.76				
	4/6/99	987.05		7.49	979.69				

Table 4-1. (continued)

Location	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
	4/14/99	987.05		6.70	980.48				
	4/23/99	987.05		7.99	979.19				
	4/30/99	987.05		8.16	979.02				
	5/7/99	987.05		8.21	978.97				
	5/14/99	987.05		8.29	978.89				
	5/21/99	987.05		8.18	979.00				
	5/27/99	987.05		7.81	979.37				
LSSC-161									
	3/5/99	980.88		7.80	973.21				odor
	3/11/99	980.88		8.56	972.45		28.51	952.50	
	3/17/99	980.88		8.71	972.30		28.39	952.62	
	3/24/99	980.88		6.38	974.63		28.10	952.91	
	4/2/99	980.88		7.65	973.36		27.68	953.33	
	4/6/99	980.88		8.22	972.79		27.92	953.09	
	4/8/99	980.88		8.23	973.38		27.49	953.39	
	4/14/99	980.88		8.76	972.25		27.60	953.41	
	4/15/99	980.88		8.71	972.90		27.43	953.45	
	4/22/99	980.88		8.84	972.77		28.08	952.80	
	4/23/99	980.88		8.84	972.17		28.12	952.89	
	4/28/99	980.88		8.81	972.80		27.80	953.08	
	4/30/99	980.88		7.98	973.03		27.84	953.17	
	5/6/99	980.88							
	5/7/99	980.88		8.78	972.23		27.59	953.42	
	5/13/99	980.88		8.86	972.75		27.48	953.40	
	5/14/99	980.88		9.04	971.97		27.63	953.38	
	5/20/99	980.88		6.15	975.46		27.38	953.50	

Table 4-1. (continued)

Location	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
	5/21/99	980.88		7.10	973.91		27.67	953.34	
	5/27/99	980.88		8.09	973.52		28.15	952.73	
	5/27/99	980.88		8.24	972.77		28.48	952.53	
	6/3/99	980.88		8.94	972.67		28.24	952.64	
	6/10/99	980.88		9.19	972.42		27.90	952.98	
	6/17/99	980.88		9.39	968.98		27.63	953.25	
	6/24/99	980.88		9.48	968.89		27.61	953.27	
	7/1/99	980.88		8.96	972.65		27.59	953.29	
	7/8/99	980.88		8.98	971.90		27.41	953.47	
	7/15/99	980.88		9.35	972.26				
	7/22/99	980.88		9.50	972.11		28.31	952.57	
	7/29/99	980.88		9.62	971.99		28.15	952.73	
	8/5/99	980.88		9.67	971.94		28.18	952.70	
	8/12/99	980.88							obstructed
	8/18/99	980.88		9.48	971.40				
LSSC-16S									
	3/5/99	981.28		8.21	973.20				
	3/11/99	981.28		9.00	972.41				sheen
	3/15/99	981.28		8.97	972.44				
	3/17/99	981.28		9.08	972.33				
	3/24/99	981.28		6.77	974.64				
	4/2/99	981.28		8.04	973.37				
	4/6/99	981.28		8.50	972.91				
	4/14/99	981.28		9.15	972.26				
	4/23/99	981.28		8.82	972.59				
	5/7/99	981.28		9.16	972.25				

Table 4-1. (continued)

Location	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
	5/14/99	981.28		9.41	972.00				
	5/21/99	981.28		7.56	973.85				
	5/27/99	981.28		8.59	972.82				
LSSC-17									
	3/11/99	982.4		10.37	972.16				
	3/17/99	982.4		10.46	972.07				
	3/24/99	982.4	9.09	9.10	973.43	0.01			LNAPL measurement suspect; well screen does not cross water table
	4/2/99	982.4		9.38	973.15				very slight sheen
	4/6/99	982.4		9.89	972.64				
	4/14/99	982.4		10.52	972.01				
	4/23/99	982.4		10.61	971.92				
	4/30/99	982.4		10.74	971.79				slight sheen on probe
	5/7/99	982.4		10.52	972.01				
	5/14/99	982.4		10.82	971.71				
	5/21/99	982.4		8.98	973.55				
	5/27/99	982.4		9.96	972.57				sheen on probe tip
LSSC-18									
	4/2/99	987.32		14.34	973.11				not developed
	4/5/99	987.32		14.76	972.69				not developed
	4/14/99	987.32		15.66	971.79				
	4/23/99	987.32		15.69	971.76				
	4/30/99	987.32		15.83	971.62				
	5/7/99	987.32		15.60	971.85				
	5/14/99	987.32		15.91	971.54				

Table 4-1. (continued)

Location	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
	5/21/99	987.32		13.85	973.60				
	5/27/99	987.32		14.96	972.49				
	6/17/99	987.32		16.28	971.16				
	6/24/99	987.32		16.35	971.09				
	7/1/99	987.32		15.75	971.69				
	7/8/99	987.32		15.85	971.59				
	7/15/99	987.32		16.24	971.20				
	7/22/99	987.32		16.36	971.08				
	7/29/99	987.32		16.48	970.96				
	8/5/99	987.32		16.51	965.10				
	8/12/99	987.32		16.47	965.14				
	8/18/99	987.32		16.36	965.25				
LSSC-19									
	4/2/99	987.03		12.21	974.95				not developed
	4/5/99	987.03		12.36	974.80				not developed
	4/14/99	987.03		12.88	974.28				
	4/23/99	987.03		13.17	973.99				
	4/30/99	987.03		13.24	973.92				
	5/7/99	987.03		13.19	973.97				
	5/14/99	987.03		13.25	973.91				
	5/21/99	987.03		12.71	974.45				
	5/27/99	987.03		12.63	974.53				
LSSC-32									
	8/12/99	980.68		9.73	970.95				
	8/18/99	980.68		9.59	971.09				
	8/26/99	980.68		9.70	970.98				

Table 4-1. (continued)

Location	Date Measured	Measuring Point Elevation	Depth to LNAPL	Depth to Water	Groundwater Elevation	LNAPL Thickness	Depth to DNAPL	DNAPL Elevation	Notes
LSSC-33									
	8/12/99	980.49		9.56	970.93				
	8/18/99	980.49		9.38	971.11				
	8/26/99	980.49		9.52	970.97				
LSSC-34I									
	8/12/99	984.74		13.83	970.91		27.71	957.03	product was a combination of sediment and NAPL
	8/18/99	984.74		13.64	971.10		27.93	956.81	
	8/26/99	984.74		13.78	970.96		26.99	957.75	
LSSC-34S									
	8/12/99	985.01		14.20	970.81				
	8/18/99	985.01		13.94	971.07				
	8/26/99	985.01		14.04	970.97				

Table 4-2. DNAPL recovery test - monitoring well LSSC-07

LOCATION	DATE AND TIME RECOVERED	DNAPL RECOVERED (L)
LSSC-07	8/9/99 10:15	1
	8/9/99 11:40	0.3
	8/9/99 12:45	0.18
	8/9/99 13:40	0.11
	8/9/99 14:40	0.11
	8/9/99 15:50	0.12
	8/10/99 8:45	0.78
	8/10/99 10:00	—
	8/10/99 11:00	0.105
	8/10/99 12:25	—
	8/10/99 13:35	0.12
	8/10/99 15:55	0.08
	8/11/99 8:50	0.35
	8/11/99 11:05	0.08
	8/11/99 13:20	0.02
	8/11/99 15:25	0.02

Note:
— No Recoverable DNAPL

Table 4-3. DNAPL recovery test - monitoring well LSSC-16I

LOCATION	DATE AND TIME RECOVERED	DNAPL RECOVERED (L)
LSSC-16I	8/9/99 13:55	0.31
	8/9/99 15:00	0.01
	8/9/99 16:00	—
	8/10/99 9:15	0.015
	8/10/99 10:30	—
	8/10/99 12:15	—
	8/10/99 13:30	—
	8/10/88 15:30	—
	8/11/99 9:15	—
	8/11/99 13:15	—
	8/11/99 16:00	—

Note:
— No Recoverable DNAPL

Table 4-4. DNAPL recovery test monitoring well LS-34

LOCATION	DATE AND TIME RECOVERED	DNAPL RECOVERED (L)
LS-34	8/9/99 10:00	0.35
	8/9/99 11:00	0.03
	8/9/99 12:40	—
	8/9/99 13:55	—
	8/9/99 14:55	—
	8/9/99 15:45	—
	8/10/99 8:25	0.01
	8/10/99 9:35	—
	8/10/99 10:35	—
	8/10/99 12:20	—
	8/10/88 13:45	—
	8/10/99 15:40	—
	8/11/99 8:45	—
	8/11/99 12:45	0.03
	8/11/99 16:10	—

Note:
— No Recoverable DNAPL

Table 4-5. 1999 DNAPL Recovery, Monitoring Well LSSC-07

LOCATION	DATE MONITORED	DNAPL RECOVERED (L)
LSSC-07		
	2/18/99	0.95
	2/25/99	1.2
	3/4/99	2.2
	3/11/99	1.1
	3/18/99	1.1
	3/25/99	0.6
	4/1/99	1.8
	4/8/99	0.7
	4/15/99	0.67
	4/22/99	0.75
	4/28/99	1.7
	5/6/99	0.97
	5/13/99	1.7
	5/20/99	1.9
	5/27/99	1.65
	6/3/99	1.12
	6/10/99	1.5
	6/17/99	1.6
	6/24/99	1.45
	7/1/99	1.05
	7/8/99	1.48
	7/15/99	1.3
	7/22/99	1.25
	7/29/99	1.2
	8/5/99	1
	8/9/99 *	1
	8/9/99 *	0.3
	8/9/99 *	0.18
	8/9/99 *	0.11
	8/9/99 *	0.11
	8/9/99 *	0.12
	8/10/99 *	0.78
	8/10/99 *	
	8/10/99 *	0.105
	8/10/99 *	
	8/10/99 *	0.12
	8/10/99 *	0.08

Table 4-5. (continued)

LOCATION	DATE MONITORED	DNAPL RECOVERED (L)
	8/11/99 *	0.35
	8/11/99 *	0.08
	8/11/99 *	0.02
	8/11/99 *	0.02
	8/18/99	0.95

NOTES:
Except for recovery test, DNAPL recovered when thickness was greater than one foot.
* - DNAPL Recovery Test Data

Table 4-6. 1999 DNAPL Recovery, Monitoring Well LSSC-16I

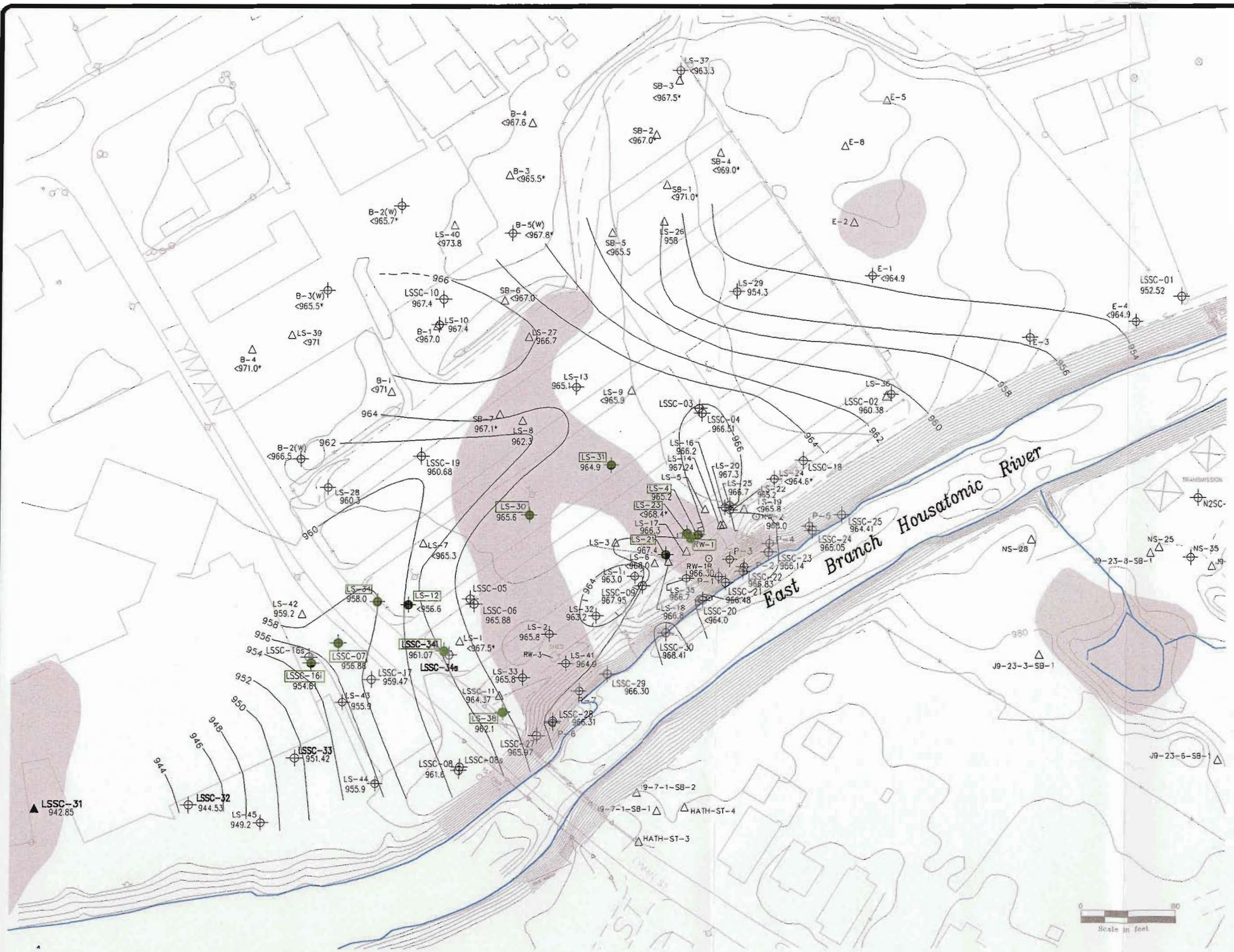
LOCATION	DATE MONITORED	DNAPL RECOVERED (L)
LSSC-16I		
	4/8/99	0.3
	4/15/99	0.45
	5/20/99	1.1
	7/8/99	0.925
	8/9/99 *	
	8/9/99 *	
	8/9/99 *	
	8/9/99 *	0.31
	8/9/99 *	0.01
	8/9/99 *	
	8/10/99 *	0.015
	8/10/99 *	
	8/10/99 *	
	8/10/99 *	
	8/10/99 *	
	8/11/99 *	
	8/11/99 *	
	8/11/99 *	

NOTES:
Except for recovery test, DNAPL recovered when thickness was greater than one foot.
* - DNAPL Recovery Test Data

Table 4-7. 1999 DNAPL Recovery, Monitoring Well LS-34

LOCATION	DATE MONITORED	DNAPL RECOVERED (L)
LS-34		
	7/9/98	1.75
	8/6/98	0.98
	8/27/98	0.64
	9/24/98	0.61
	10/22/98	0.7
	11/12/98	0.75
	12/10/98	1.1
	12/17/98	1.1
	12/23/98	1.1
	1/7/99	1.3
	1/28/99	1.2
	2/18/99	1.1
	3/18/99	0.3
	4/15/99	0.55
	6/17/99	1.3
	7/22/99	1.2
	8/9/99 *	0.35
	8/9/99 *	0.03
	8/9/99 *	
	8/9/99 *	
	8/9/99 *	
	8/9/99 *	
	8/10/99 *	0.01
	8/10/99 *	
	8/10/99 *	
	8/10/99 *	
	8/10/99 *	
	8/10/99 *	
	8/11/99 *	
	8/11/99 *	0.03
	8/11/99 *	

NOTES:
Except for recovery test, DNAPL recovered when thickness was greater than one foot.
* - DNAPL Recovery Test Data



EXPLANATION

- APPROXIMATE DELINEATION OF FORMER OXBOW
- ES2-1 — PREVIOUSLY INSTALLED MONITORING WELL
- 64X(W) — PREVIOUSLY INSTALLED OIL RECOVERY CAISSON
- RW-1(X) — PREVIOUSLY INSTALLED PUMPING WELL
- X-11 — PREVIOUSLY INSTALLED SOIL BORING
- WP-3 — PREVIOUSLY INSTALLED PIEZOMETER
- LSSC-18 — NEWLY INSTALLED SOURCE CONTROL MONITORING WELL
- LSSC-31 — NEWLY INSTALLED SOURCE CONTROL SOIL BORING
- 961.2 — TOP OF TILL ELEVATION
- 946 — TOP OF TILL CONTOUR I FOOT INTERVAL
- * — APPROX. TOP OF TILL ELEVATION
- DNAPL OBSERVED IN WELL

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.

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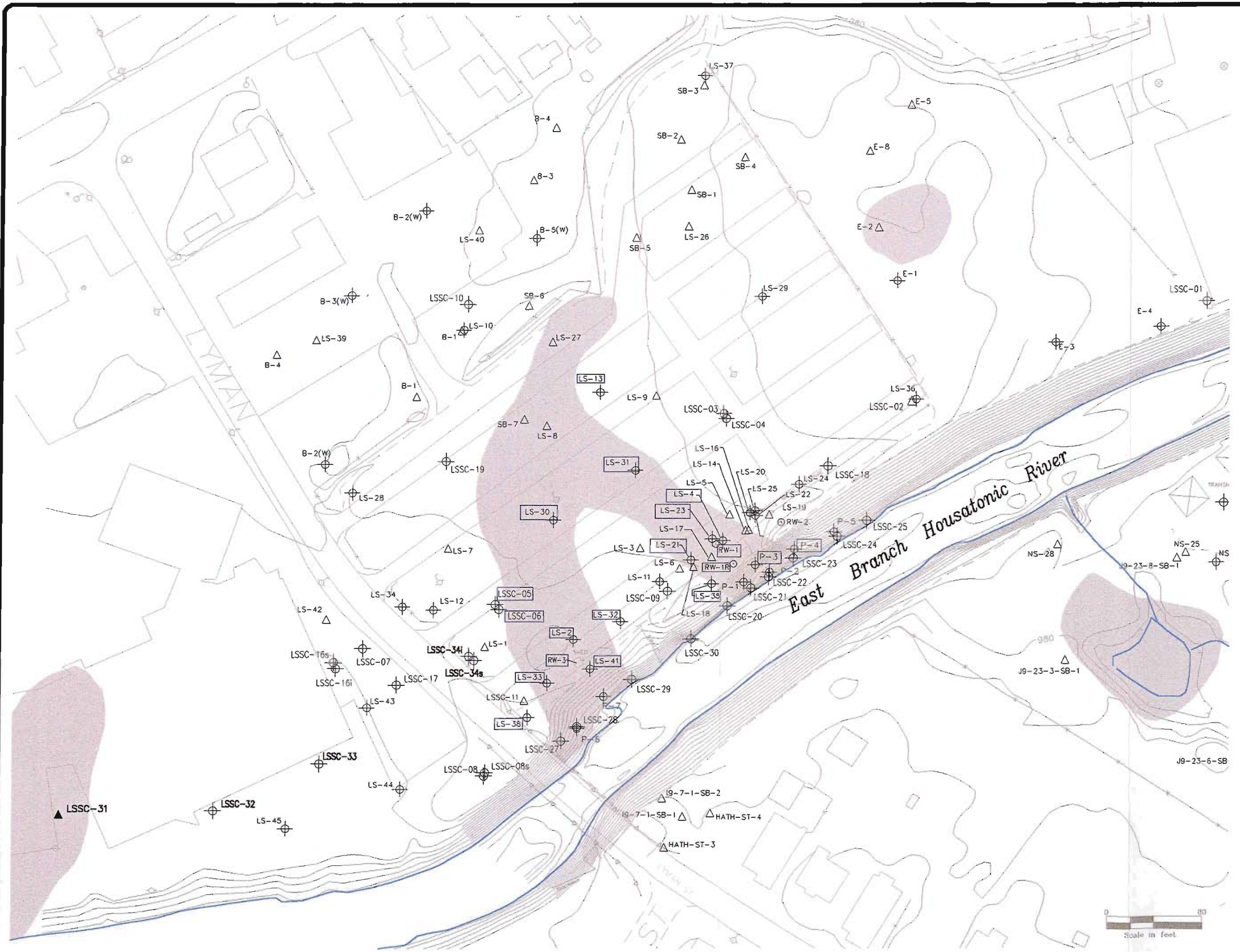
9908lyman-DNAPL.dwg

Figure 4-1 Extent of DNAPL, Lyman Street Site



EXPLANATION

- APPROXIMATE DELINEATION OF FORMER OXBOW
- ES2-1 — PREVIOUSLY INSTALLED MONITORING WELL
- 64X(W) — PREVIOUSLY INSTALLED OIL RECOVERY CAISSON
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- X-11 — PREVIOUSLY INSTALLED SOIL BORING
- WP-3 — PREVIOUSLY INSTALLED PIEZOMETER
- LSSC-18 — NEWLY INSTALLED SOURCE CONTROL MONITORING WELL
- LSSC-31 — NEWLY INSTALLED SOURCE CONTROL SOIL BORING
- LNAPL OBSERVED IN WELL

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.

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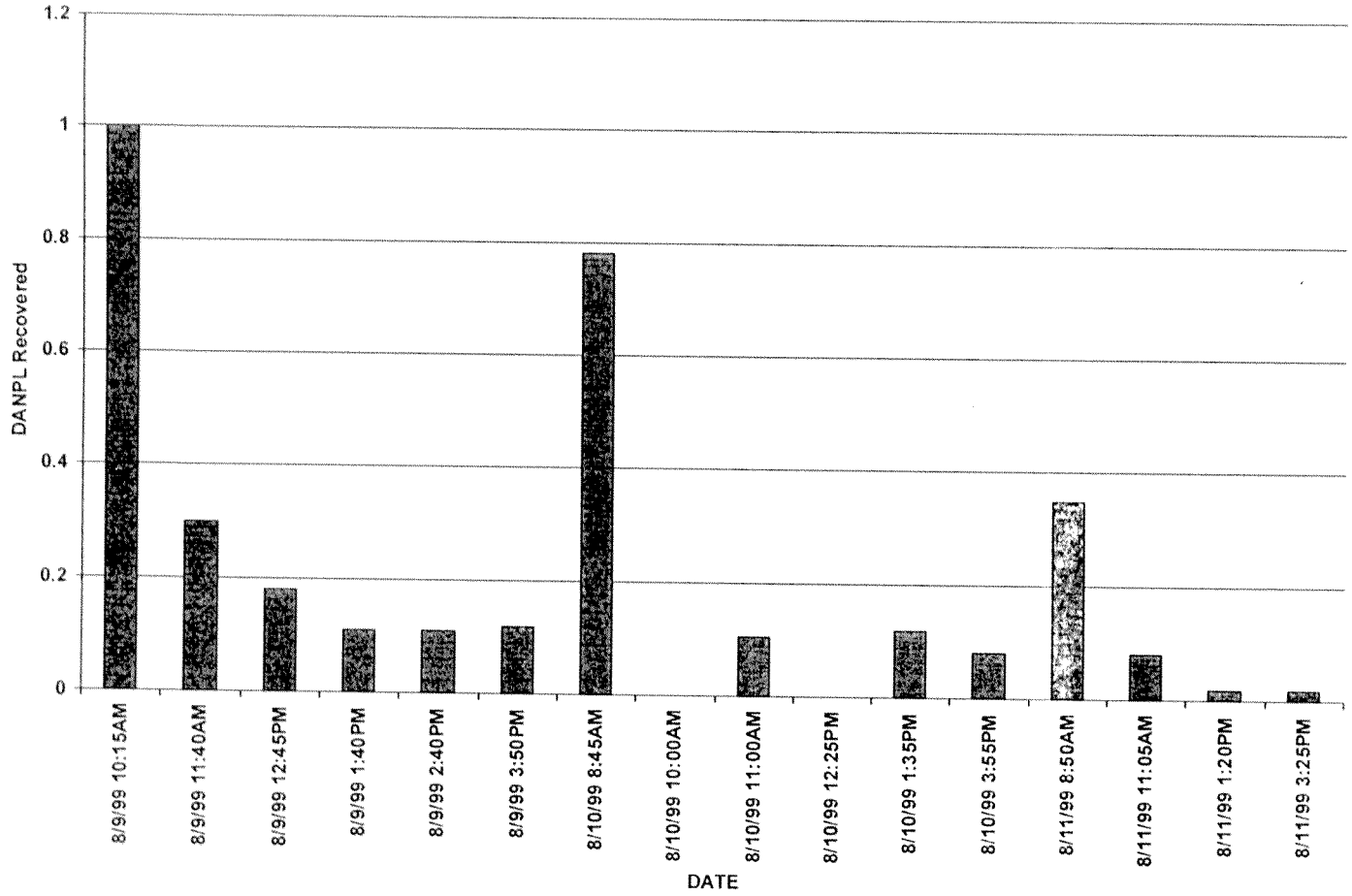
9908lyman-LNAPL.dwg

Figure 4-2 Extent of LNAPL, Lyman Street Site

Figure 4-3. DNAPL Recovery Test, Well LSSC-07



5 RECOMMENDATIONS

The data from the newly installed wells and borings indicate that DNAPL occurs west of the Lyman Street parking lot in monitoring wells LSSC-07 and LSSC-16I. The new wells installed along the south side of the building at 10 Lyman Street did not encounter any indications of DNAPL. With respect to the till confining layer, these wells are located downslope of monitoring wells LSSC-07 and LSSC-16I. The slow DNAPL recovery rate from well LSSC-16I indicates that it may be located near the front edge of the DNAPL zone, where the thickness of the DNAPL is small.

DNAPL recovery tests performed in the three wells located near the edge of the DNAPL zone (LS-34, LSSC-07 and LSSC-16I) did not recover DNAPL at a high enough rate to warrant installation of an automated recovery system. GE proposes that the DNAPL monitoring/recovery frequency for wells LSSC-07 and LSSC-16I be increased to daily and that any DNAPL that is present be removed. Well LS-34 should continue to be monitored weekly and the DNAPL should be removed when its thickness reaches one foot. The newly installed monitoring wells LSSC-32 and LSSC-33 should be added to the monthly water level and NAPL monitoring program. Wells LSSC-34I and LSSC-34S should be monitored weekly. If DNAPL accumulates in LSSC-34I to a thickness of 1 foot or greater, it should be removed manually. If LNAPL accumulates in LSSC-34S to a thickness of 0.25 feet or greater, it should be manually removed.

These NAPL monitoring and recovery data shall be summarized in the monthly monitoring reports for the Lyman Street site and the annual short-term effectiveness report. Additionally, after collecting approximately four weeks of daily monitoring and recovery data from wells LSSC-07 and LSSC-16I, a summary report, will be prepared and submitted to the agencies, to evaluate whether the monitoring and removal frequency in these wells should be modified and whether other remedial actions are warranted.

APPENDIX A
BORING LOGS

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	BORING/WELL NUMBER	LSSC-31
PROJECT NAME	Source Control Upper Reach Housatonic River	DATE DRILLED	7/28/99
LOCATION	Pittsfield, Massachusetts	CASING TYPE/DIAMETER	None
DRILLING METHOD	HSA	SCREEN TYPE/SLOT	None
SAMPLING METHOD	SS	GRAVEL PACK TYPE	None
GROUND ELEVATION	980.89	GROUT TYPE/QUANTITY	Portland/Volclay
TOP OF CASING	None	DEPTH TO WATER	NM
LOGGED BY	SKC	GROUND WATER ELEVATION	NM
NORTHING	130462.18	EASTING	532372.98

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DISCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		SS01					Moderate yellowish brown, fine SAND with cobbles of concrete and asphalt (FILL).	1.0	
0	3 5 3 4	SS02					Loose, Moderate yellowish brown, fine SAND with coarse GRAVEL, some cobbles, and trace organics, dry to moist, well graded (SW, GW).	3.0	
0	6 5 6 7	SS03					Loose, Moderate yellowish Brown to Dark yellowish Brown, fine SAND with coarse GRAVEL, some cobbles, and trace organics, dry to moist, well graded, fine Dark yellowish Brown SAND in spoon tip (SW, GW).	5.0	
5.1	4 3	SS04		5			Loose, Dark to Dusky yellowish Brown, fine SAND, moist, well graded (SW).	6.0	
1.7	3 3 4 5	SS05					Loose, Dusky yellowish Brown, fine laminated SAND and SILT with trace organics (wood chunks), moist (SP or SW, ML).	8.0	
1.3	2 2 3 4	SS06					Same as above.	10.0	
0	2 3 4 12	SS07		10			Loose, Light olive Gray, SAND with trace gravel, well graded, wet (SW).	12.0	
0.9	6 6 5 4	SS08					Medium dense, Light olive Gray, SAND and GRAVEL, wet, well graded (SW, GW).	14.0	
0	3 9	SS09					Top 0.05 same as above. Bottom 0.35 Medium dense, interbedded, Light olive Gray fine SAND and Dark Brown PEAT, wet, poorly graded (PT, SP)	15.0	
0	3 3 3 3	SS10		15			Loose, Light olive Gray, coarse SAND and GRAVEL with trace fine sand and silt, wet, well graded (SW, GW).	17.0	
3.4	2 4 3 2	SS11					Loose, Top 0.1 same as above, Bottom 0.4 Olive Black SILT, moist, poorly graded, (ML).	19.0	
0.1	2 2	SS12					Loose, Olive Gray, SILT with few clay, wet, poorly graded (ML)	20.0	
0.1	7 8 8 8	SS13		20			Loose, Light olive Gray, fine SAND and SILT, laminated, wet, poorly graded (SM).	22.0	Portland / Volclay Grout
0.4	2 6 6 6	SS14					Same as above.	24.0	
0.1	1 2 2 5	SS15		25			Same as above with more sand in spoon tip.	26.0	
0.1	2 3 7 11	SS16					Top 0.3 same as above. Bottom 1.5 Loose, Light olive Gray to Moderate yellowish Brown, fine SAND interbedded with fine SAND and SILT and trace gravel, wet, graded (SM)	28.0	
0	3 4 5 9	SS17					Same as above (Bottom).	30.0	
0	7 5 10 9	SS18		30			Top 1.0 Medium dense, Olive Gray, fine SAND, moist, poorly graded (SP), Bottom 0.1 Moderate yellowish Brown, fine SAND, moist.	32.0	
0	10 14 19 37	SS19					Dense, Moderate yellowish Brown SAND with little gravel, moist, well graded (SW).	34.0	
0	21 27	SS20		35			Dense, Dark yellowish Orange to Moderate yellowish		

Continued Next Page

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** LSSC-31

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 7/28/99

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DISCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0	13 19 18 25/5 8	SS21					Brown, fine SAND with 0.1' layers of Light olive Gray coarse sand and Moderate Brown to Dark yellowish Brown fine sand, moist, poorly graded except for coarse sand layer (SP, SW).	36.0	
	25 15 11 11	SS22					Very dense, layers of SAND (same as above), with Light to Moderate yellowish Brown SILT in spoon tip.	38.0	
				40			Medium dense, Light olive Gray to Dusky Yellow laminated SILT with trace clay and gravel, wet, graded.	40.0	
	6 7 7 11	SS23					Medium dense, Light olive Gray to Dusky Yellow laminated SILT and CLAY with trace gravel, moist, (TILL).	42.0	

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	BORING/WELL NUMBER	LSSC-32
PROJECT NAME	Source Control Upper Reach Housatonic River	DATE DRILLED	7/29/99
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	980.89	GROUT TYPE/QUANTITY	Portland/Volclay
TOP OF CASING	980.68	DEPTH TO WATER	NM
LOGGED BY	SKC	GROUND WATER ELEVATION	NM
NORTHING	130590.77	EASTING	532377.06

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DISCRIPTION	CONTACT DEPTH	WELL DIAGRAM
0		SS01					Medium dense, Moderate Brown SAND with brick and concrete fragments, dry (FILL).		
0	14 12 10	SS02					Loose, red brick fragments, dry (FILL).	2.0	
0	2 2 4	SS03		5			Top 0.3 Loose, Dark Brown, fine SAND with limestone cobbles and coal ash, dry, (FILL). Middle 0.9 Dark yellowish Brown, fine SAND with bands of Fe staining. Bottom 0.8 Moderate yellowish Brown, SAND, dry, poorly graded (SP).	4.0	
0	3 2 3 3	SS04					Top 0.7 Loose, Moderate yellowish Brown, fine SAND with bands of Dusky yellowish Brown silt (SM). Bottom 0.4 Dark yellowish Brown, SAND, dry, graded.	6.0	
0	3 3 3 3	SS05					Top 1.2 Loose, Yellowish Gray to Moderate yellowish Brown, SAND, moist, Fe staining. Bottom 0.4 Light olive Gray, SAND, wet, graded (SW).	8.0	
0	3 2 3 3	SS06		10			Loose, Moderate olive Brown to Moderate yellowish Brown SAND, wet, graded, (SW).	10.0	Portland / Volclay Grout
0	3 4 5 6	SS07					Loose, Light olive Gray to Olive Gray, SAND and GRAVEL with trace fines, wet, well graded (SW, GW)	12.0	
0	3 4 4 4	SS08		15			Same as above.	14.0	
0	3 3 3 2	SS09					Top 0.5 same as above but Moderate yellowish Brown, (SW, GW). Bottom 0.3 Loose, Light olive Gray to Black, SILT, wet (ML).	16.0	
0.2	2 2 3 3	SS10					Loose, Light olive Gray, fine SAND and some silt, graded, wet (SM).	18.0	
0	3 2 4 4	SS11		20			Same as above, with less silt (SM).	20.0	
0	4 6 8 7	SS12					Medium dense, Light olive Gray, fine SAND with lens of Moderate yellowish Brown fine SAND, wet, graded (SP).	22.0	Bentonite Seal
0	4 4 6 7	SS13		25			Top 0.1 Light olive Gray, fine SAND with little silt, laminated. Bottom 1.0 Medium dense, Dark yellowish Orange to Moderate yellowish Brown, fine SAND, graded, wet (SP).	24.0	
0	4 8 9 10	SS14					Top 1.0 same as above. Bottom 0.3 Dark yellowish Orange, fine SAND, wet, poorly graded (SP).	26.0	
0	3 4 8 12	SS15					Medium dense, Dark yellowish Orange to Grayish Brown, fine SAND with trace GRAVEL in bottom 0.3, wet, graded (SW).	28.0	
0.4	8 10 12 12	SS16		30			Top 0.5 Medium Dense, Light olive Gray, SAND and GRAVEL, wet, well graded (SW, GW). Bottom 0.3 Moderate yellowish Brown, fine SAND, wet, poorly graded (SP).	30.0	#6 Filter Sand
0	4 9 19 74	SS17					Medium dense to very dense, Light olive Gray to Moderate yellowish Brown, SAND and GRAVEL, wet, well graded (SWG).	32.0	010 Slot 2 PVC Schd 40 Screen
0	13 12	SS18		35			Top 0.1 Moderate yellowish Brown, SAND and GRAVEL, Continued Next Page	34.0	

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** LSSC-32

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 7/29/99

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DISCRIPTION	CONTACT DEPTH	WELL DIAGRAM
	36 13		X				Fe staining, wet, well graded (SWG). Bottom 0.5 Dense, Light olive Gray to Dusky Yellow, SILT and CLAY with trace gravel, moist, well graded (TILL).	36.0	1' 2 PVC Schd 40 Sump

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	BORING/WELL NUMBER	LSSC-33
PROJECT NAME	Source Control Upper Reach Housatonic River	DATE DRILLED	7/30/99
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	980.96	GROUT TYPE/QUANTITY	Portland/Volclay
TOP OF CASING	980.49	DEPTH TO WATER	NM
LOGGED BY	SKC	GROUND WATER ELEVATION	NM
NORTHING	130678.87	EASTING	532416.27

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DISCRIPTION	CONTACT DEPTH
0	4 2 2	SS01					Loose, Dark yellowish Brown, fine SAND and SILT with brick fragments and coal ash, dry, (FILL).	2.0
0	2 2 2	SS02					Loose, coal ash and glass fragments, Fe staining on bottom 0.5, dry, (FILL).	4.0
0	6 7 5 4	SS03		5			Top 0.2 coal ash, Fe staining. Bottom 0.6 Medium dense, Dark yellowish Brown to Dusky yellowish Brown, SILT, moist, poorly graded (FILL).	6.0
0	2 2 3 3	SS04					Top 0.2 coal ash, Fe staining. Bottom 1.8 Loose, bands of Olive Black PEAT and SILT with Light olive Gray fine SAND, laminations in silt/peat layers, moist, both units poorly graded (FILL, PT, SP).	8.0
		SS05					No Recovery.	10.0
0	7 5 5 5	SS06		10			Medium dense, Light olive Gray to Grayish Olive, SAND with trace silt, wet, graded (SW).	12.0
0	5 7 11 9	SS07					Medium dense, Light olive Gray to Olive Gray, SAND and GRAVEL, wet, well graded (SWG).	14.0
		SS08		15			No Recovery.	16.0
							No Recovery.	18.0
0	5 7 8 9	SS09					Medium dense, Light olive Gray to Moderate olive Brown, fine SAND and SILT with bands of Fe staining, laminated, wet, graded (SM).	20.0
0	4 6 9 8	SS10		20			Medium dense, Light olive Gray to Dusky Yellow, fine SAND with trace silt, wet, poorly graded (SP).	22.0
0	3 8 10 15	SS11					Medium dense, Light olive Gray to Dusky Yellow, fine SAND, laminated, heavy Fe staining in bottom 0.4, wet, poorly graded (SP).	24.0
0	5 5 5 6	SS12		25			Loose, Light olive Gray to Dusky Yellow, fine SAND with trace gravel in bottom 0.5, laminated, Fe stained in sections, wet, graded (SP).	26.0
0.1	9 18 28	SS13					Top 1.0 same as above. Bottom 1.0 Dense, Light olive Gray to Dusky Yellow, GRAVEL and SAND, graded to very hard silty gravel and broken cobble conglomerate in spoon tip, wet, well graded (SW, GW).	28.0
	8 7 6 5	SS14					Top 0.8 Medium dense, layers of well-graded GRAVEL and Light olive Gray to Dusky Yellow, SILT and CLAY with moderate plasticity (GW, ML, CL). Bottom 0.4 Light olive Gray to Dusky Yellow SILT and CLAY, laminated, wet (ML, CL).	30.0
0.1	12 24 20	SS15		30			Dense, Light olive Gray to Dusky Yellow, SILT and CLAY with little gravel and weathered limestone cobbles, laminated, wet to moist at bottom of spoon, well graded (TILL).	32.0
0	12 11 11	SS16					Same as above with pocket of loose wet clay material	34.0

Continued Next Page

WELL DIAGRAM

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

BORING_WELL P009 G... MA GDT 9/9/99

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER P009-001 **BORING/WELL NUMBER** LSSC-33

PROJECT NAME Source Control Upper Reach Housatonic River **DATE DRILLED** 7/30/99

Continued from Previous Page

FID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DISCRIPTION	CONTACT DEPTH	WELL DIAGRAM
							(<0.1 thick) at 0.6 (TILL).		

HSI GEOTRANS
A TETRA TECH COMPANY

BORING/WELL CONSTRUCTION LOG

PROJECT NUMBER	P009-001	**BORING/WELL NUMBER**	LSSC-34I
PROJECT NAME	Source Control Upper Reach Housatonic River	**DATE DRILLED**	7/29/99
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	983.02	**GROUT TYPE/QUANTITY**	Portland/Volclay
TOP OF CASING	984.74	**DEPTH TO WATER**	NM
LOGGED BY	SKC	**GROUND WATER ELEVATION**	NM
NORTHING	130803.12	**EASTING**	532506.10

FID (ppm)	BLOW COUNTS	SAMPLE ID.	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DISCRIPTION	CONTACT DEPTH
	4 7 7	SS01					Top 0.7 Medium dense, Grayish Orange, Dusky yellowish Brown, and Pale yellowish Brown, bands of fine SAND and GRAVEL, dry, well graded. Bottom 0.1 Light olive Gray, SILT, dry (FILL).	2.0
	7 5 6	SS02					Medium dense, layers of Black coal ash with layers (0.1 to 0.4) of Dark yellowish Orange, fine SAND, dry, graded (FILL).	4.0
	5 9 11	SS03		5			Top 0.5 Medium dense, Grayish Brown to Black, fine SAND with trace gravel overlying Fe stained SAND layer (0.05 thick). Bottom 0.3 Very pale Orange, fine SAND with large broken weathered cobbles, dry, graded (FILL).	6.0
	12 10 12	SS04					Medium dense, Grayish Brown, SAND with some gravel, Fe stained, dry, graded (SW).	8.0
0.1	7 4 5 5	SS05					Loose, Pale yellowish Brown to Light olive Gray, fine SAND with few Dark Brown silt and trace organics, moist, graded (SM).	10.0
0.1	4 3 3	SS06		10			Same as above with more Dark Brown silt.	12.0
0.1	3 3 3	SS07					Same as above with trace gravel. Water table at 12.6.	14.0
0.1	3 7 7	SS08		15			Same as above but wet and with less silt.	16.0
0.1	11 8 5 7	SS09					Medium dense, Light olive Gray, GRAVEL and SAND with little silt, wet, well graded (GW, SW).	18.0
0	7 9 12	SS10					Same as above with Moderate yellowish Brown areas in spoon, sheen in bottom 0.3 of material.	20.0
136.8	7 8 10 8	SS11		20			Top 0.8 Medium dense, Light olive Gray to Moderate yellowish Brown, SAND and GRAVEL with little silt, wet, well graded, sheen throughout (GW, SW). Bottom 0.1 and spoon tip have Dusky Yellow, SILT with little gravel, wet (ML).	22.0
14.8	10 13 14 17	SS12					Medium dense, Light olive Gray to Dusky Yellow, SILT, wet, poorly graded, sheen in spoon above and around it (ML).	24.0
3	11 13 15	SS13		25			Medium dense, Light olive Gray to Moderate yellowish Brown, SILT with little gravel, moist, well graded (TILL).	26.0
0.8	24 17 27	SS14					Same as above.	28.0

WELL DIAGRAM

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

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 982.90
TOP OF CASING 985.01
LOGGED BY SKC
NORTHING 130807.44

BORING/WELL NUMBER LSSC-34S
DATE DRILLED 7/29/99
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 NM
GROUND WATER ELEVATION NM
EASTING 532502.63

FID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft. BGL)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DISCRIPTION	CONTACT DEPTH	WELL DIAGRAM
				5			See log of LSSC-34I	15.0	Portland / Volclay Grout; Bentonite Seal; #6 Filter Sand; .010 Slot 2 PVC Schd 40 Screen
				10					
				15					