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**SOIL REMEDIATION REPORT
O'HENRY LAUNDRY, TUTU, ST. THOMAS
U.S. VIRGIN ISLANDS**

Prepared for:

**L'Henri, Inc.
St. Thomas, U.S. Virgin Islands**

Prepared by:

**IT Corporation
Knoxville, Tennessee**

IT Project No. 409830

May 1995

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IT Project No. 409830

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Project Coordinator
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Transmittal of Soil Remediation Report
O'Henry Laundry, Tutu, St. Thomas
U.S. Virgin Islands

Dear Ms. Kwan:

Enclosed please find four copies of the Soil Remediation Report for the O'Henry Laundry site in St. Thomas, U.S. Virgin Islands.

If you have any questions regarding the report please contact L'Henry, Inc. Counsel Nancy D. Anna, Esq. at (809) 776-6533, or myself at (615) 690-3211.

Sincerely yours,

Agnes Manzila

for Belinda K. Price, RPG
Project Manager

BKP/dkc/1890

Enclosures

cc: Andrew Praschak, EPA
Leonard Reed, DPNR
Adrian Schottroff, DPNR
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List of Acronyms

ASTM	American Society for Testing and Material
CLP	Contract Laboratory Program
cm/s	centimeter(s) per second
DPNR	Department of Planning and Natural Resources
EPA	U.S. Environmental Protection Agency
ft ³	cubic foot; cubic feet
GC	gas chromatography
µg/kg	micrograms per kilogram
mg/kg	milligrams per kilogram
mL	milliliter(s)
PCE	tetrachloroethane
pcf	pounds per cubic foot
PID	photoionization detector
ppb	parts per billion
PRG	preliminary remediation goal
psi	pounds per square inch
QC	quality control
RCRA	Resource Conservation and Recovery Act
SOW	Statement of Work
USCS	Unified Soil Classification System
USVI	U.S. Virgin Islands
VOC	volatile organic compound

1.0 Introduction

The O'Henry Laundry is located on Highway 38, Tutu, St. Thomas, U.S. Virgin Islands (USVI). The site is subject to an on-going remedial investigation/feasibility study which is being performed by others on an area wide basis. The origin of PCE and other volatile organic compounds (VOC) in groundwater beneath this and other properties in the Tutu area has yet to be determined. Contaminants, principally tetrachloroethane (PCE), have been detected in subsurface soils adjacent to the laundry. On behalf of L'Henri Inc., IT Corporation (IT) performed an evaluation of PCE in soil and determined that soil remediation was warranted in order to protect further degradation of groundwater in the vicinity of the laundry. Subsequent to that determination, L'Henri Inc. requested permission from the EPA to perform soil remediation.

Between March 6 and 17, 1995, soil remediation efforts were conducted at the site. Soil remediation activities were conducted in accordance with the work plan prepared by IT (1994) approved by the U.S. Environmental Protection Agency (EPA) Region II and in conformance with a consent order between L'Henri Inc. and EPA signed March 1, 1995. EPA personnel performed oversight of the soil remediation activities and collected split samples as described in this report. The USVI Department of Planning and Natural Resources (DPNR) personnel visited the site during the soil removal efforts.

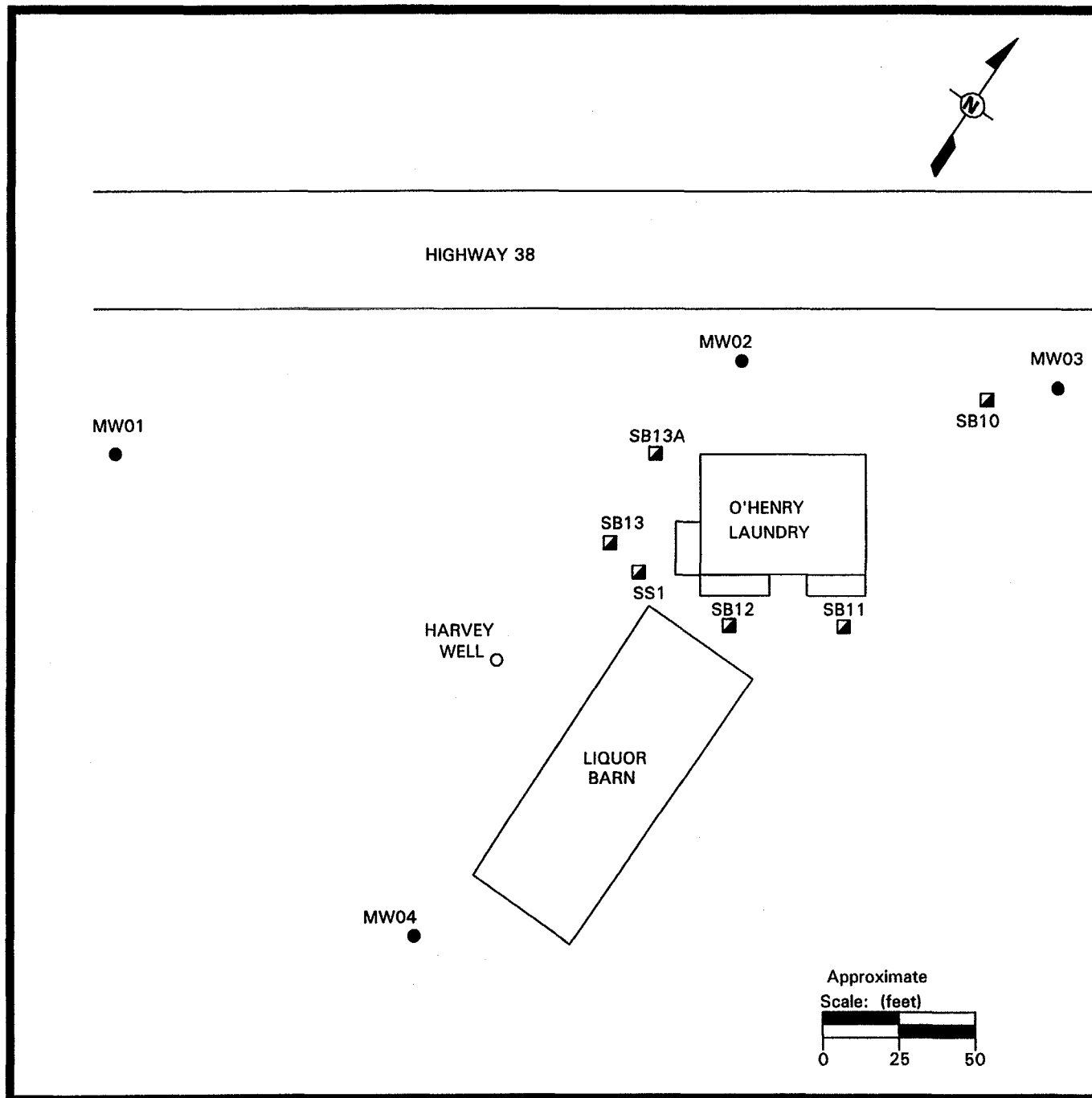
This report addresses remediation of PCE in vadose zone soil in an area immediately adjacent to the southwest side of the O'Henry Laundry (Figure 1-1). Approximately 700 cubic feet (ft³) of soil containing PCE was excavated and a soil venting pile was constructed at a secure area adjacent to the site. The objective of the soil remediation was to reduce the human health risk and the potential for shallow groundwater contamination resulting from known soil contamination.

1.1 Background

1.1.1 Previous Investigations

A surface soil sample, e-01 (approximately at soil boring location SS1 on Figure 1-1), was collected by Camp, Dresser, McKee (CDM) from a location near the south-west corner of O'Henry Laundry in September 1988. Analytical results indicated the presence of "tetrachloroethane" at a concentration of 440 milligrams per kilogram (mg/kg). In June 1989, three soil samples were collected by CDM from the same location as e-01 at different depth

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Legend

- Existing Monitor Well
- ▣ Existing Soil Boring
- Water Well

FIGURE 1-1
SITE LOCATION MAP

O'HENRY LAUNDRY
ST. THOMAS
U.S. VIRGIN ISLANDS



intervals. Samples e-02-03, e-02-01, and e-02-02 were collected from the surface, and at depth intervals of 0.5 to 1.5 feet and 1.5 to 2.5 feet, respectively. Soil analytical results indicated that sample e-02-02 contained 1,2-dichloroethene, trichloroethane, and tetrachloroethane at concentrations of 0.02, 0.075, and 180 mg/kg, respectively. During subsequent investigations, six soil borings were drilled and sampled at the site (Figure 1-1). Soil boring SS1, located near the southwest corner of the laundry, was targeted to be at the same location as e-01 and e-02 and was drilled and sampled in June 1990. The boring was drilled to a depth of approximately 24 feet, terminating at auger refusal. Five soil samples obtained from the boring were analyzed for EPA target compound list VOCs. Analytical results indicated the presence of acetone, 2-butanone, methylene chloride, PCE, and total xylenes. Acetone, 2-butanone, methylene chloride, and xylenes were found in the associated laboratory method blanks and are common laboratory reagents. Therefore, the concentrations of these substances may not be representative of actual field conditions. In the sample collected from a depth of 2.5 and 4.0 feet (sample TW2), PCE was detected at a concentration of 5,400 micrograms per kilogram ($\mu\text{g/kg}$). At a depth of approximately 6 feet (sample TW5), PCE was detected at a concentration of 59,000 $\mu\text{g/kg}$, and at a depth of approximately 19 feet (sample TW20), PCE was not detected (however, the detection level was elevated).

Five additional soil borings have been drilled and sampled at the O'Henry Laundry and are discussed in *Technical Memorandum II, Results of the Field Program, Tutu Service Station Investigation, St. Thomas, U.S. Virgin Islands* (Geraghty and Miller, 1993). The soil borings are designated SB10, SB11, SB12, SB13, and SB13A in Figure 1-1. PCE was the only significant VOC detected. Concentrations above detection limits were as follows:

- 29 $\mu\text{g/kg}$ from soil boring SB11 at 0.0 to 2.0 feet
- 200 $\mu\text{g/kg}$ from soil boring SB13 at 4.0 to 6.0 feet
- 15 $\mu\text{g/kg}$ from soil boring SB13A at 0.0 to 2.0 feet.

1.1.2 Soil Cleanup Level

Two criteria for the soil remediation were developed and presented in the work plan (TT, 1994). These criteria were a risk-based preliminary remediation goal (PRG) using a direct soil exposure scenario and a model-based determination of the maximum PCE concentration in soil that is protective of groundwater if not remediated. Both criteria were based on site-specific data. The soil cleanup level chosen for the soil remediation was 328 $\mu\text{g/kg}$ PCE, the more stringent (lower) of the two values calculated (TT, 1994). Prior to beginning soil remediation activities, discussion with the EPA personnel on site indicated that the EPA cleanup level was expected to be approximately 200 $\mu\text{g/kg}$. The EPA cleanup level was

reported by EPA personnel to be based on vadose zone modeling using site-specific parameters and performed by an EPA contractor. The final results of the modeling were not available at the time of the soil remediation project but, based on the expected results and until the EPA cleanup level is finalized, 200 $\mu\text{g}/\text{kg}$ will be used on a provisional basis. At the request of the EPA, soil was removed to approximately 200 $\mu\text{g}/\text{kg}$.

2.0 Field Activities

Between March 6 and 17, 1995, soil remediation activities were conducted at the site. Activities included installation of one soil boring, soil excavation, soil venting pile construction, backfill of the excavation area, and soil and water samples collection. Appendix A includes visual classification of soil boring logs, field gas chromatography screening activities, variance logs, validated analytical results, and geotechnical testing results.

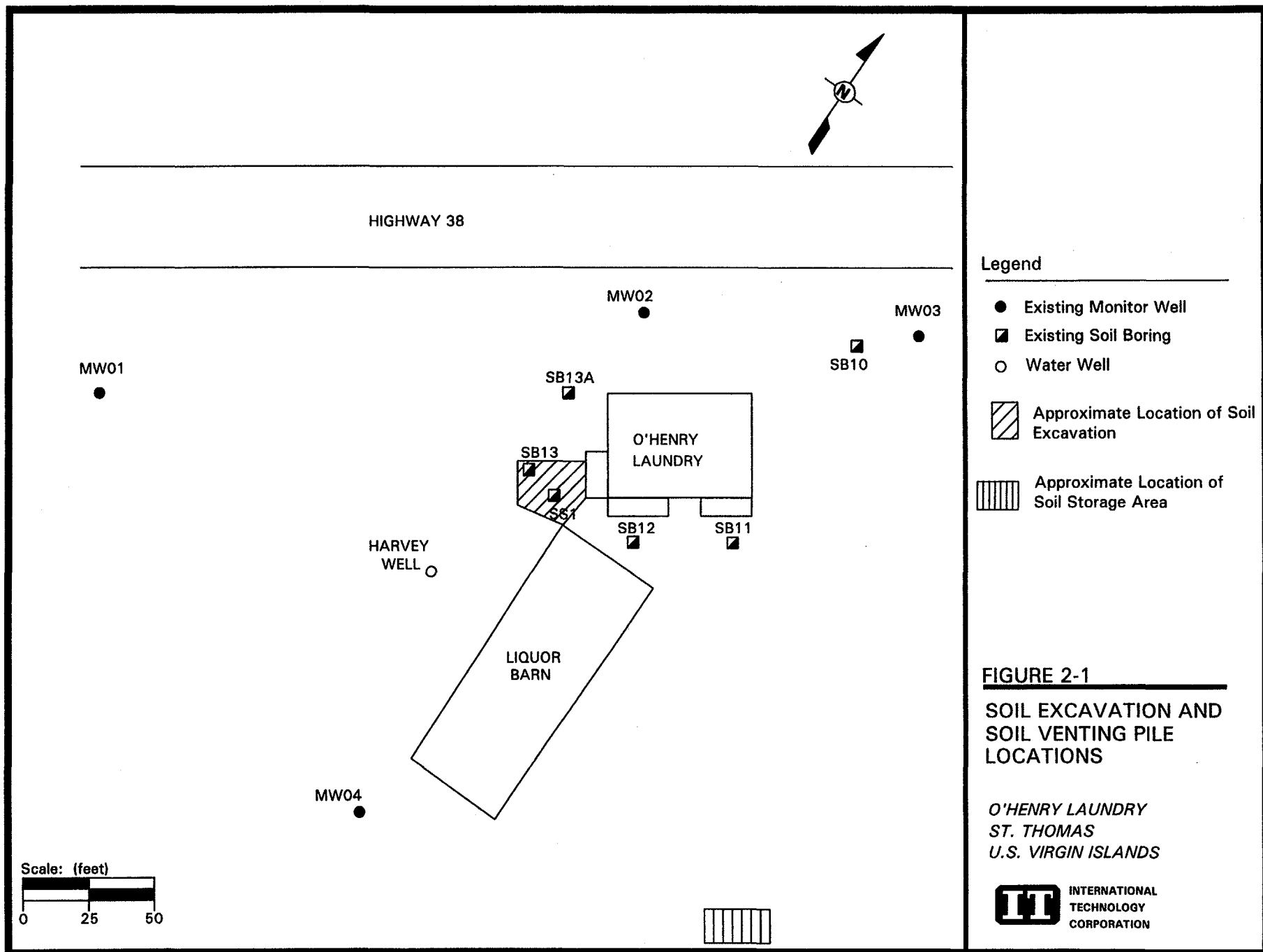
2.1 Soil Boring Installation

Previous analytical results indicated that the maximum concentration of PCE in subsurface soil is approximately 59,000 $\mu\text{g/kg}$ at a depth of 6 feet in soil boring SS1. Soil boring SS1 is located near the southwest side of the laundry (Figure 2-1). The maximum concentration detected in other borings around the site was 200 $\mu\text{g/kg}$ was detected in soil boring SB13, which is located near SS1. One soil boring, ITSB01, was drilled during the March 1995 field efforts. Soil boring ITSB01 was installed in the area that previously exhibited the highest PCE concentrations (Figure 2-2). The purpose of the boring was to investigate the depth of soil contamination, more accurately determine the depth to bedrock, and collect geotechnical samples. The boring was advanced to auger refusal at a depth of approximately 15 feet. The boring was visually logged in accordance with the Unified Soil Classification System (USCS); a boring log is included in Appendix A. Two undisturbed samples were collected and submitted for the following analyses: grain size by American Society for Testing and Materials (ASTM) Method D 422; moisture content by ASTM D 2216; permeability by ASTM D 5084; porosity/density by Engineering Manual (EM) 1110-2-1906, Appendix II; and organic content by ASTM D 2974.

2.2. Soil Excavation

Soils in the vicinity of soil boring SS1 were excavated in stages to depths of approximately 1 to 2 feet, 3 to 4 feet, 5 to 6 feet, and 7 to 8 feet. The location of the soil excavation is shown in Figure 2-1. At each stage, undisturbed soil samples were collected and analyzed by field gas chromatography (GC). At each interval, a minimum of three samples were collected from the floor of the excavation. Excavation continued until weathered bedrock was encountered at a depth of 8 feet and PCE concentrations in soil samples submitted for field GC analysis were below the cleanup level (200 $\mu\text{g/kg}$). A total of 35 soil samples were collected for field GC analysis. On reaching the final dimensions of the excavation, five soil samples were collected from the walls and floor of the excavation for confirmation that remediation

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goals had been met. The samples were analyzed for VOCs according to EPA's Contract Laboratory Program (CLP) 1990 Statement of Work (SOW) (Section 3.3).

The extent of excavation at each stage, sampling locations and sample results are shown in Figures 2-2 through 2-7. The excavation was visually logged and a log is included in Appendix A. Excavated soils were temporarily stored on visqueen prior to the construction of a soil venting pile.

2.2.1 Soil Sample Collection

During the remediation effort, soil samples were collected for two purposes. Screening samples were collected during excavation for field GC analysis. When the field laboratory had determined that the defined, cleanup level had been met, samples for confirmation were collected and sent to the fixed-base laboratory for analysis of VOCs by EPA CLP 1990 SOW protocol. In addition, soil samples from the upper 1 to 2 feet of the excavation were also sent to the laboratory at the request of the EPA. A summary of the soil sampling information, including sample numbers, locations, depths, and analyses are presented in Table 2-1.

All samples for analysis were collected in a manner that minimized losing PCE by volatilization. Soil samples for analysis at the fixed-base laboratory were collected as grab samples and were packed unmixed into a glass container, leaving no headspace. The soil samples were immediately cooled to 4°C and shipped under appropriate chain of custody to the Quanterra Environmental Services laboratory in Knoxville, Tennessee for confirmation analysis. All sample results were validated by Quanterra in Knoxville.

The EPA project manager collected split samples of some of the confirmation samples. The results of these split sample analyses are included in Section 3.0.

2.2.2 Field Quality Control Samples

To ensure reliability of field sampling procedures and materials, field QC samples were collected or prepared for each sample shipment to the fixed based laboratory. Field QC samples included two trip blanks, one equipment rinsate, one field blank and one field duplicate sample. QC samples were analyzed for the same compounds as samples (CLP VOCs).

Trip Blanks. Trip blanks are defined as samples that originate from analyte-free water taken from the laboratory to the sampling site and returned to the laboratory with the volatile

TABLE 2-1

**Summary of Site Remediation Analytical Sampling
O'Henry Laundry
Tutu, St. Thomas, U.S. Virgin Islands
IT Project Number 409830.002**

Sample Location/ Description	Sample Number	Sampled	Coordinates (Feet)				Field GC Analysis	Confirmatory Analysis	
		Date	x ^a	y ^a	z ^b				
Borehole IT-SB-01	IT-SB-01-05.0	6-Mar-95	7.00	4.00	5.00	-	5.60	X	X
	IT-SB-01-14.5	6-Mar-95	7.00	4.00	14.50	-	15.00	X	X
	IT-SB-01-10.0	6-Mar-95	7.00	4.00	10.00	-	10.50	X	X
	IT-SB-01-10.0-DP	6-Mar-95	7.00	4.00	10.00	-	10.50	X	
First Sampled Interval of Excavation	EXS-01	7-Mar-95	3.00	6.00	1.00	-	2.00	X	X
	EXS-02	7-Mar-95	6.00	0.00	1.00	-	2.00	X	X
	EXS-03	7-Mar-95	9.00	0.00	1.00	-	2.00	X	X
	EXS-04	7-Mar-95	3.00	4.50	2.00	-	3.00	X	X
	EXS-05	7-Mar-95	9.00	5.00	1.75	-	2.75	X	X
	EXS-06	8-Mar-95	6.00	6.75	2.00	-	3.00	X	
	EXS-06MS	8-Mar-95	6.00	6.75	2.00	-	3.00	X	
	EXS-06MD	8-Mar-95	6.00	6.75	2.00	-	3.00	X	
	EXS-07	8-Mar-95	1.00	4.00	2.00	-	2.75	X	
	EXS-08	8-Mar-95	2.00	7.50	3.00	-	3.25	X	
EXS-09	8-Mar-95	11.00	0.00	1.00	-	1.25	X		
Second Sampled Interval of Excavation	EXS-10	8-Mar-95	1.00	2.00	2.75	-	3.00	X	
	EXS-11	8-Mar-95	5.50	0.50	3.00	-	3.25	X	
	EXS-12	8-Mar-95	10.30	-1.50	3.75	-	4.00	X	
	EXS-13	8-Mar-95	1.25	7.50	3.75	-	4.00	X	
	EXS-14	8-Mar-95	9.00	5.00	3.75	-	4.00	X	
Third Sampled Interval of Excavation	EXS-15	8-Mar-95	7.00	-2.50	6.00	-	6.25	X	
	EXS-16	8-Mar-95	5.00	1.75	7.00	-	7.25	X	
	EXS-17	8-Mar-95	1.50	3.50	6.00	-	6.25	X	
	EXS-18	8-Mar-95	5.50	6.25	6.50	-	6.75	X	
Westerly Extension of Excavation	EXS-19	8-Mar-95	2.50	12.00	2.25	-	2.50	X	
	EXS-20	8-Mar-95	2.75	9.50	2.50	-	2.75	X	

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TABLE 2-1

**Summary of Site Remediation Analytical Sampling
O'Henry Laundry
Tutu, St. Thomas, U.S. Virgin Islands
IT Project Number 409830.002**

Sample Location/ Description	Sample Number	Sampled	Coordinates (Feet)				Field GC Analysis	Confirmatory Analysis	
		Date	x ^a	y ^a	z ^b				
Approximate Depth 6 ft	EXS-21	8-Mar-95	11.66	0.00	5.50	-	5.75	X	
	EXS-22	8-Mar-95	9.00	3.25	6.00	-	6.25	X	
Excavation Walls	EXS-23	9-Mar-95	10.00	-3.75	4.00	-	4.25	X	X
	EXS-24	9-Mar-95	10.00	-2.33	6.33	-	7.33	X	X
	EXS-25	9-Mar-95	5.50	-2.75	4.00	-	4.25	X	X
	EXS-26	9-Mar-95	6.00	-0.50	6.00	-	6.25	X	X
	EXS-27	9-Mar-95	2.00	2.33	5.75	-	6.00	X	X
	EXS-27DU	9-Mar-95	2.00	2.33	5.75	-	6.00	X	
	EXS-28	9-Mar-95	1.25	2.00	4.25	-	4.50	X	X
	EXS-29	9-Mar-95	-1.50	5.00	5.00	-	5.25	X	X
	EXS-30	9-Mar-95	4.25	-0.50	5.33	-	5.58	X	X
	EXS-31	9-Mar-95	3.75	-1.25	3.75	-	4.00	X	X
Excavation Floor (Final Extent)	EXS-32	9-Mar-95	2.00	10.00	2.00	-	3.00	X	X
	EXS-33	9-Mar-95	8.25	-0.75	8.00	-	8.50	X	X
	EXS-34	9-Mar-95	6.00	3.00	8.00	-	8.50	X	X
	EXS-35	9-Mar-95	3.25	3.50	8.00	-	8.50	X	X
Devcon Quarry (Excavation Backfill)	Devcon1	9-Mar-95	na	na	na		X		
	Devcon1-DP	9-Mar-95	na	na	na		X		
	Devcon1-MS	9-Mar-95	na	na	na		X		
	Devcon1-MD	9-Mar-95	na	na	na		X		
Decontamination Water	DCW-Mar-10-95	10-Mar-95	na	na	na			X	
Equipment Rinse	Equipment Rinse	9-Mar-95	na	na	na			X	
Field Blank	FB MAR 9-95	9-Mar-95	na	na	na			X	
Trip Blank	TB Mar 9-95	9-Mar-95	na	na	na		X	X	
	TB030695	6-Mar-95	na	na	na		X	X	

^a X and Y coordinates are referenced to the northwest corner of the Liquor Barn. The X direction corresponds approximately to the north. The Y direction corresponds approximately to west.

^b The Z coordinate (depth) is referenced to the top of the concrete paving between the Liquor Barn and O'Henry Laundry.

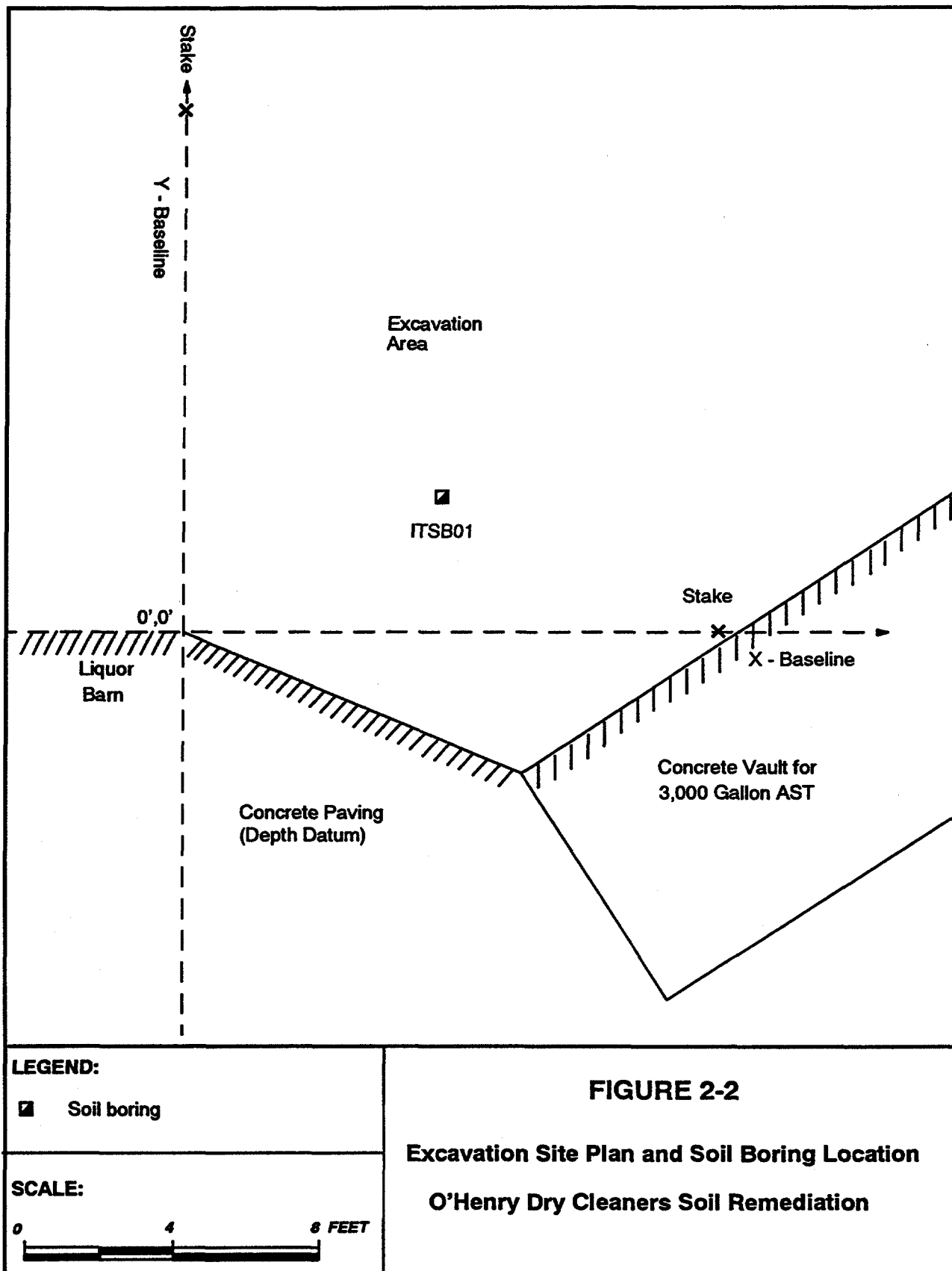
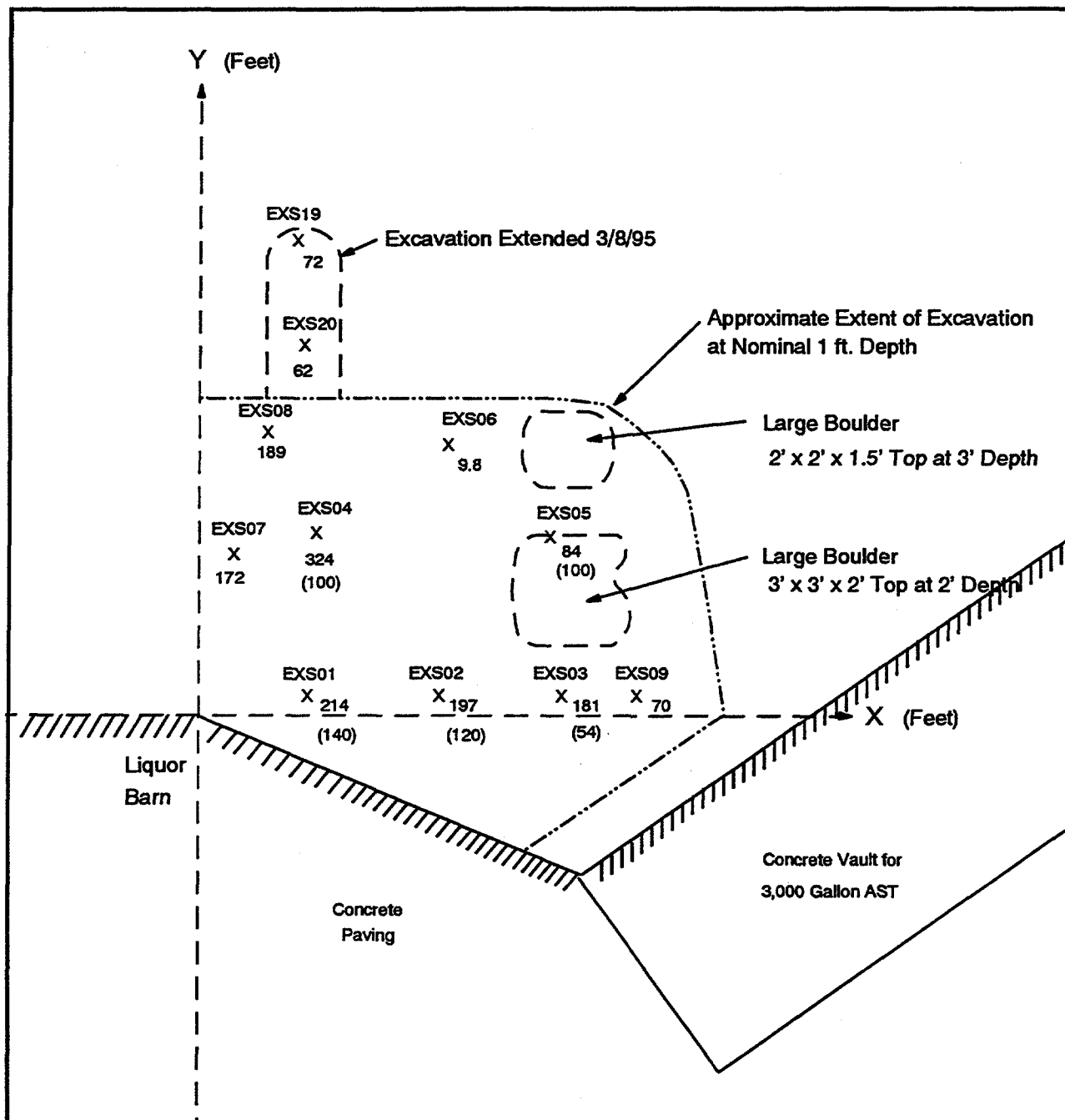


FIG1.drw/LHENRI/mc/3-24-94

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LEGEND:

- X EXS 35 - Soil sampling location
- 110 Field GC analytical result concentrations in ug/kg
- (160) Confirmation sample results concentrations in ug/kg

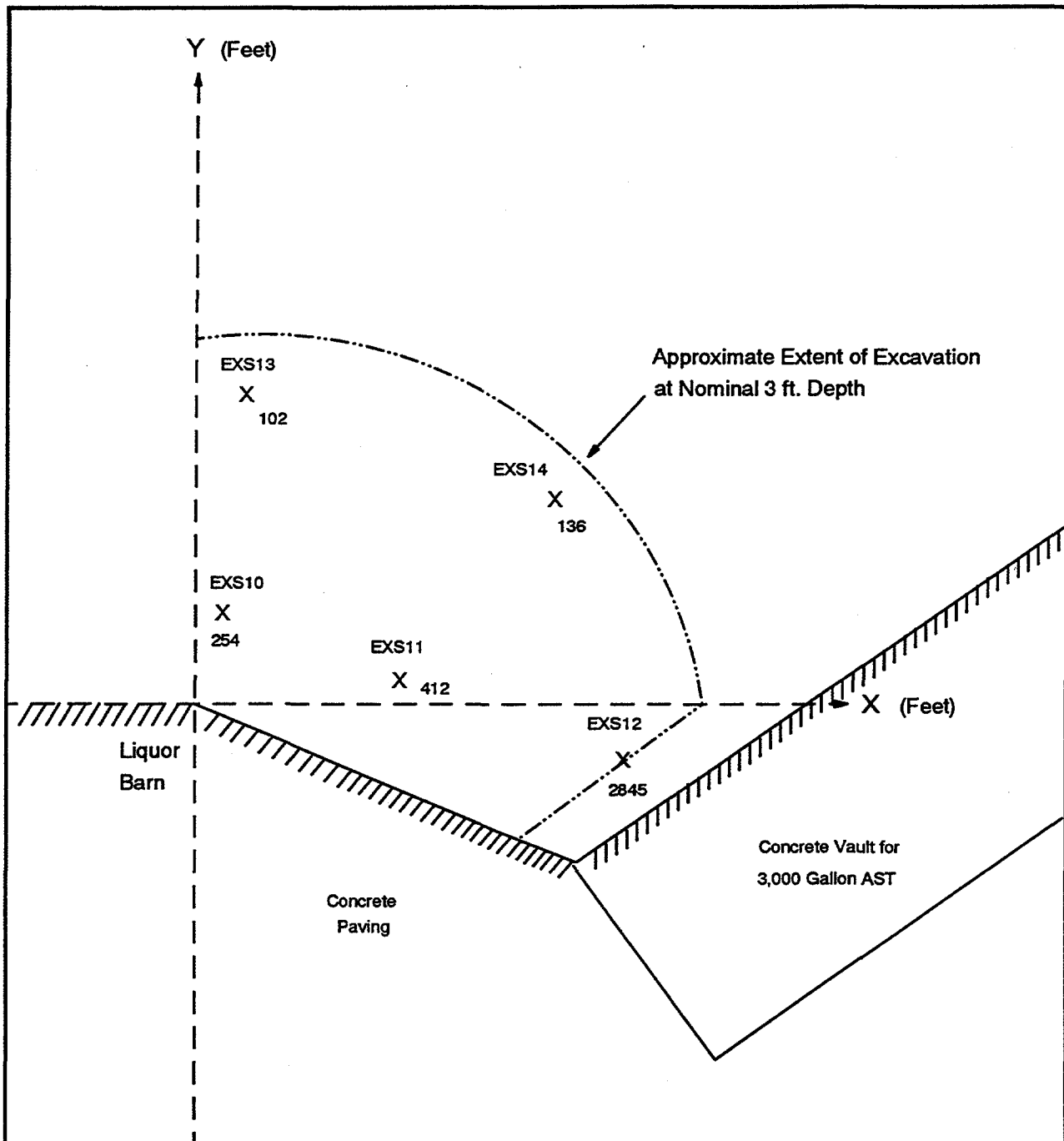
SCALE:



FIGURE 2-3

PCE Concentrations (ug/kg) at 1'-2' Depth (Approx.)

O'Henry Dry Cleaners Soil Remediation



LEGEND:

X EXS 35 - Soil sampling location
110 Field GC analytical result
concentrations in ug/kg

SCALE:

0 4 8 FEET

FIGURE 2-4

PCE Concentrations (ug/kg) at 3'-4' Depth (Approx.)

O'Henry Dry Cleaners Soil Remediation

FIG3.drw/LHENRI/mc/3-24-94

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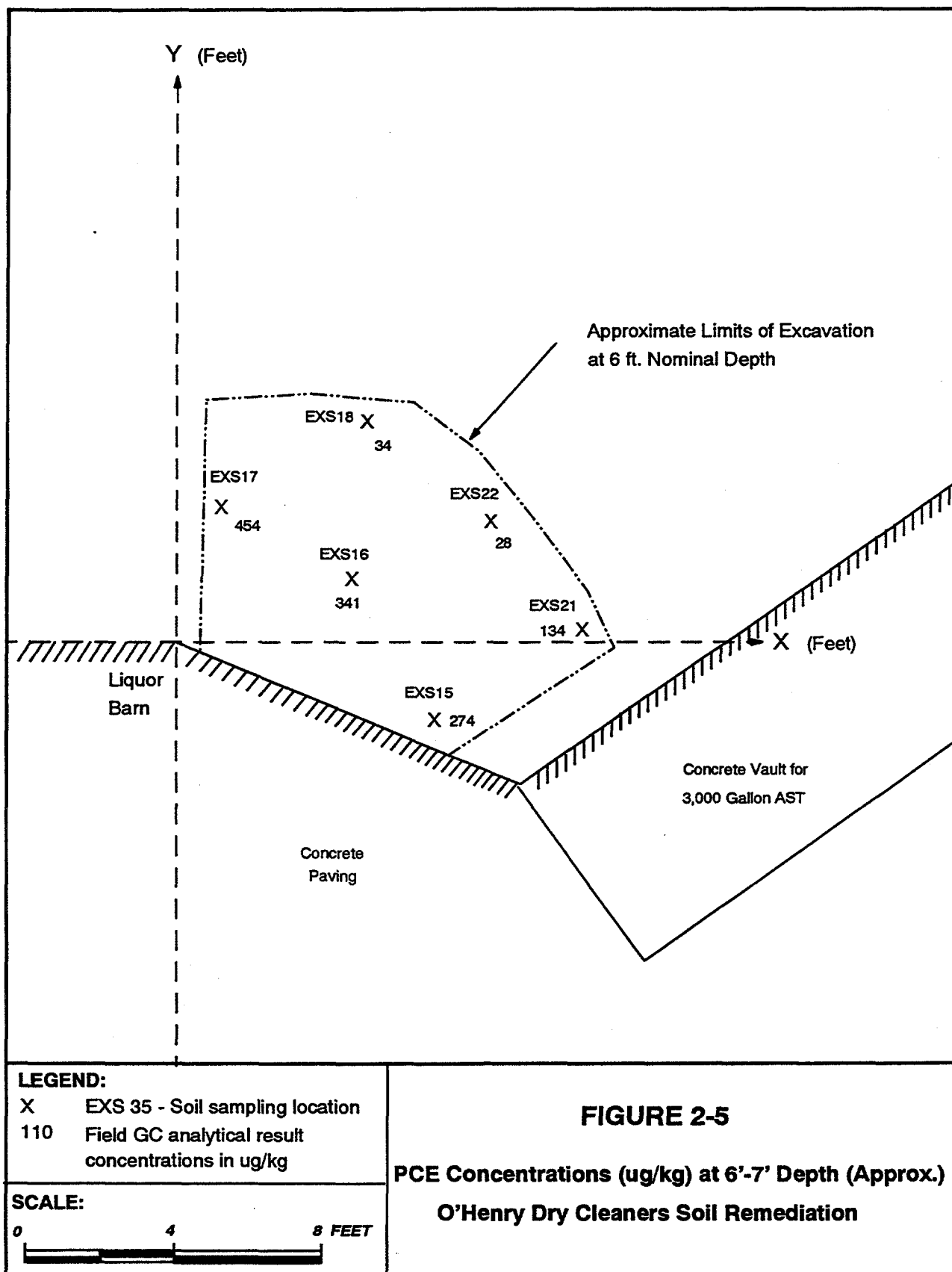


FIG4.drw/LHENRI/mc/3-24-94

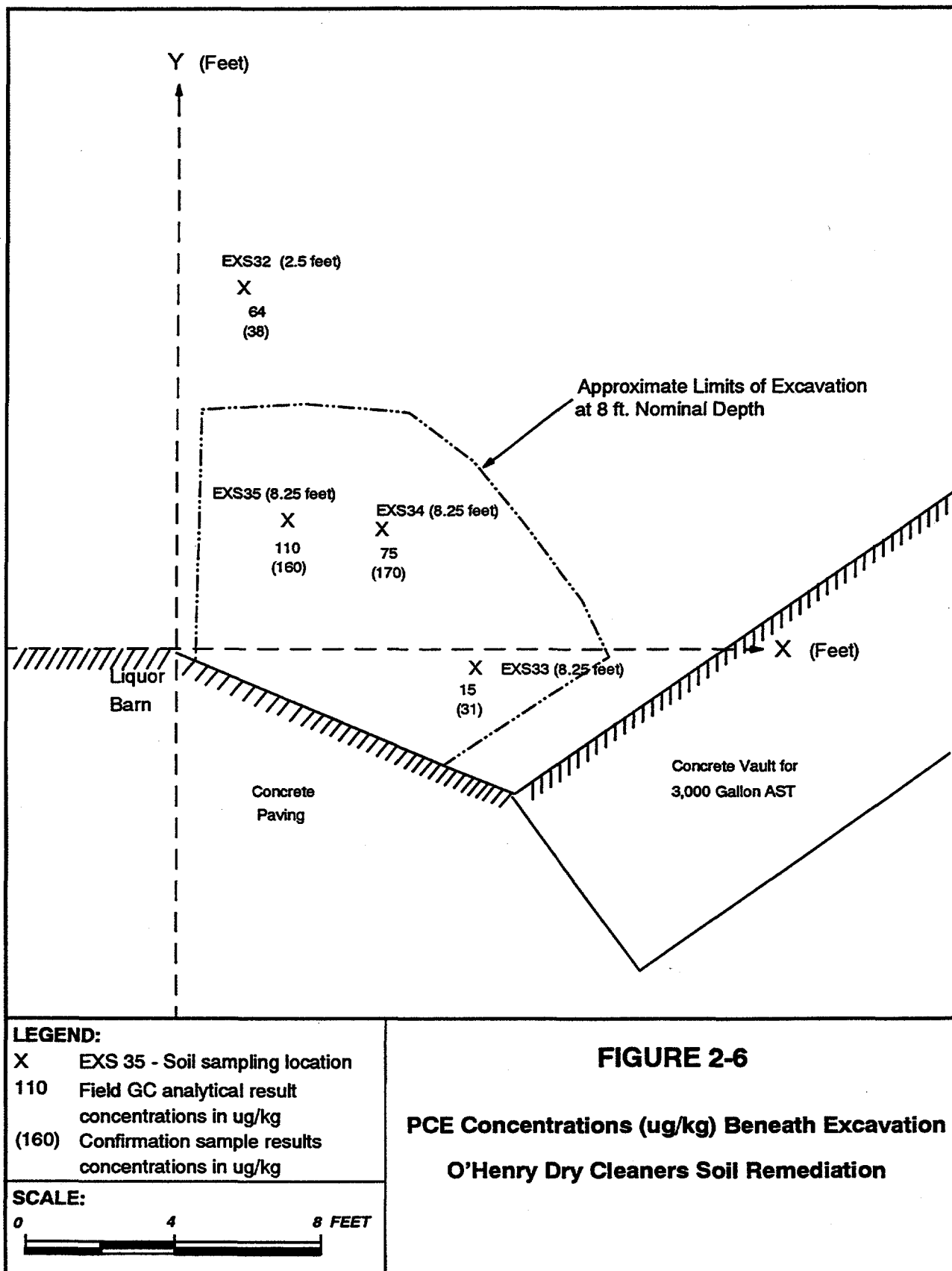
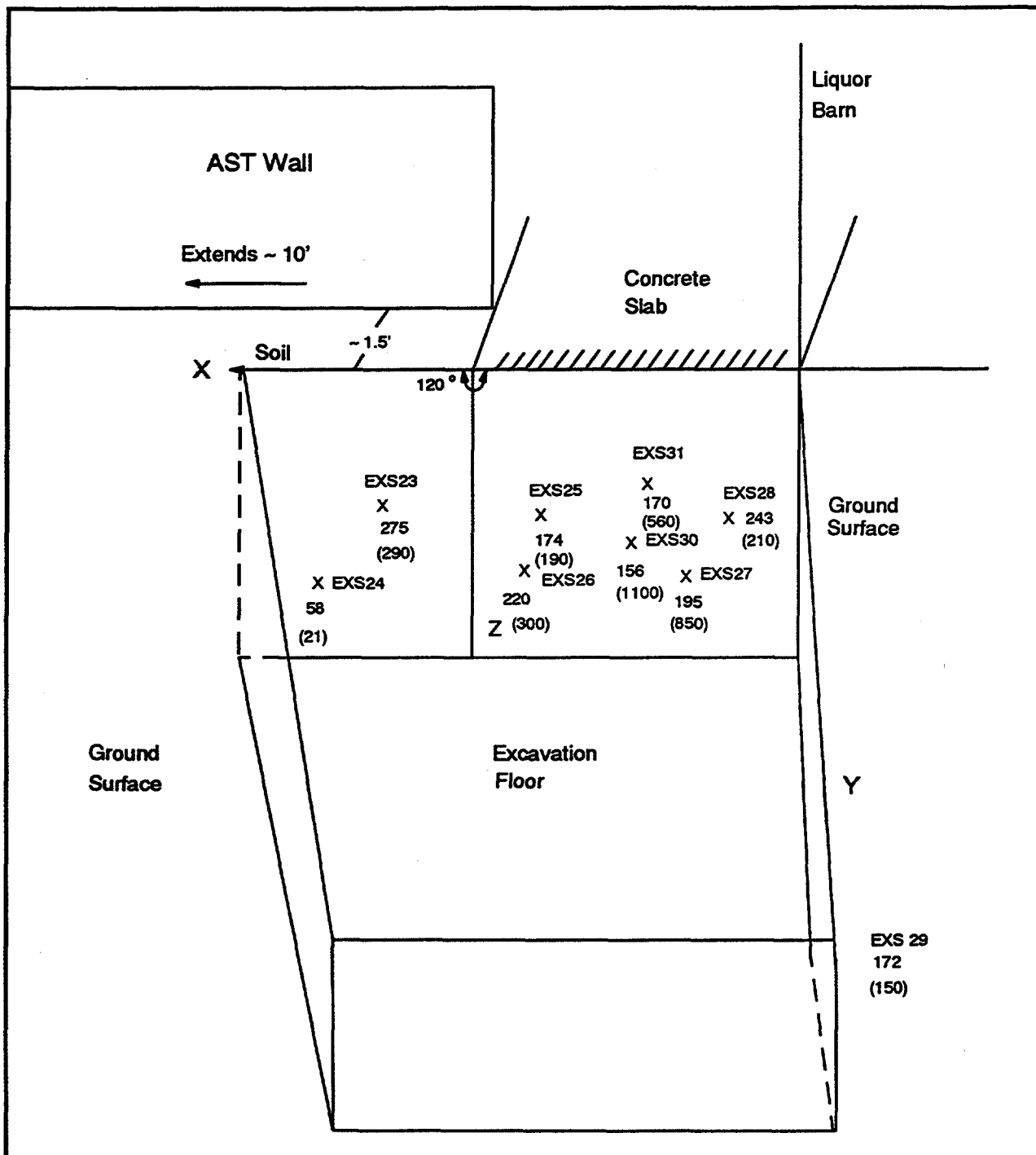


FIG5.drw/LHENRI/mc/3-24-94



LEGEND:

- X EXS 35 - Soil sampling location
- 110 Field GC analytical result concentrations in ug/kg
- (160) Confirmation sample results concentrations in ug/kg

Not to Scale

FIGURE 2-7

**PCE Concentrations (ug/kg) in Excavation Walls
O'Henry Dry Cleaners Soil Remediation**

FIG6.drw/LHENRI/mc/3-27-94

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organic samples. The purpose of the trip blank is to monitor potential cross contamination of the samples for volatiles during handling and shipment. One trip blank accompanied each cooler containing soil samples as it was transported to the fixed base laboratory.

Equipment Rinsate. One equipment rinsate was collected to verify the effectiveness of sampling equipment decontamination and to monitor for potential cross contamination between samples. The equipment rinsate was collected from the final analyte-free water rinses of the equipment process. After a piece of sampling equipment was fully decontaminated, deionized water was poured across it. The water then was collected in the appropriate sample container as the rinsate sample.

Duplicate Samples. Duplicate samples were collected simultaneously with the original samples. Two duplicate samples were analyzed by the field laboratory and one duplicate sample was analyzed by the fixed base laboratory.

Field Blank. A source blank is a sample from the final rinse water used for decontamination, which is transferred from its original container to a sample container at the sample location.

2.2.3 Field Screening

Soil samples were collected and analyzed on site for the purpose of monitoring the removal of soil containing PCE adjacent to the O'Henry Laundry facility. The analytical program provided real-time data of reliable quality for the purpose of guiding the excavation and avoiding either the removal of an excessive amount of soil or the failure to remove enough soil prior to backfilling.

Detection limits of between 4.33 and 12.5 $\mu\text{g/kg}$ for PCE were used for the field laboratory analysis. Detailed soil screening field activities and analytical methods are included in Appendix A.

2.2.4 Backfilling of Excavation Area

The excavation area was backfilled to grade using 30 tons of clean soils transported to the site from Devcon quarry located on Highway 38, in the Tutu area. The backfill material was sampled and submitted for field GC analysis (sample number Devcon 1). Analytical results indicated that PCE concentrations were below the detection limit of 5 $\mu\text{g/kg}$. The excavation

was filled in lifts. A motorized compactor was used to compact the material between the lifts. Photographs of the excavation process are included in Appendix B.

2.3 Soil Venting Pile Construction

Excavated soils are being treated on site using ex situ soil venting to volatilize the contaminants from the soil. The work plan for interim soil remediation (IT, 1994) indicated that soils found to contain detectable levels of PCE would be stored in Department of Transportation (DOT) approved 55-gallon drums or roll-off containers with plastic liners. However, during the March 1995 field activities, it was observed that the proposed storage area was upslope of the adjacent Liquor Barn and if the soil was drummed and stored per the work plan, loose drums could potentially roll into a parking area and become a safety hazard. The drummed soils also would eventually need to be treated as Resource Conservation and Recovery Act (RCRA) waste to stringent PCE cleanup standards of 0.5 µg/kg. Further, soil treatment facilities for solvent-contaminated soils are not available on the island of St. Thomas. Therefore, the EPA Project Coordinator and IT Task Manager agreed that construction of an on-site soil venting pile was a more viable soil treatment alternative to storing the soils in drums with a view to treating the soil at a later date. A verbal approval was obtained by the EPA Project Coordinator from the EPA Region II Superfund Branch Chief, and the change was approved in writing by the EPA Project Coordinator (see variance No. 6 in Appendix A).

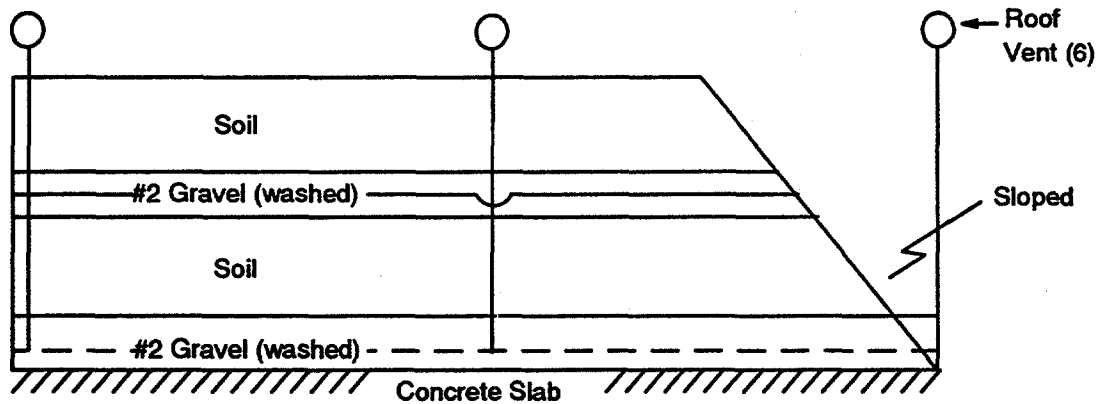
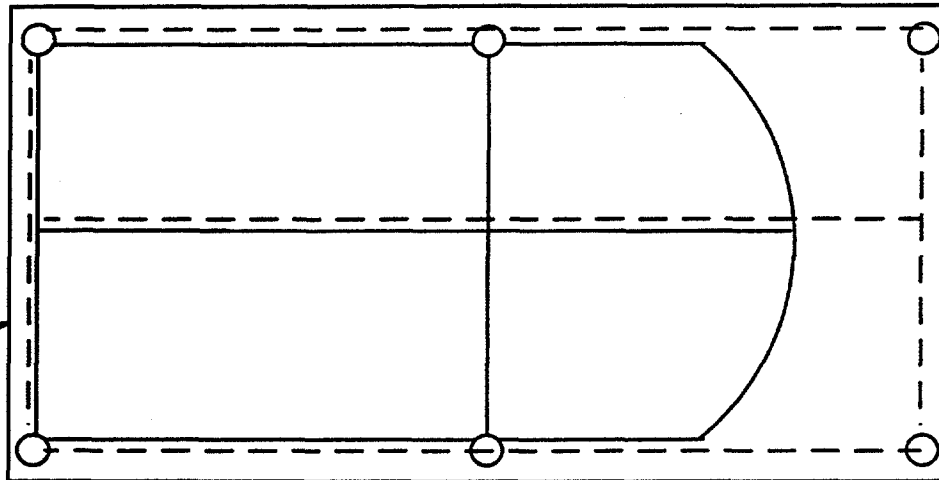
A soil pile is contained within a 15 by 25 foot concrete pad with 6 foot reinforced concrete walls (Figure 2-1). A shed roof was constructed over the soil venting pile to protect the soil pile against rainfall. Excavated soils were interlayered with washed coarse (1/2 to 1 inch) gravel. Four-inch diameter schedule 20 slotted corrugated black plastic vent pipes were placed horizontally in the gravel layers. Vent pipes were manifolded to roof turbines to provide passive circulation through the soil pile. A reinforced concrete block wall was built around the four sides of the soil pile. Currently, the soil pile is passively venting to the atmosphere, the USVI DPNR and the EPA have indicated that no air permit is necessary. Figure 2-8 shows the as-built soil venting pile. Photographs showing the progressive soil pile construction process are included in Appendix B.

2.4 Equipment Decontamination

The soil sample collection equipment was cleaned by the following steps prior to the collection of any soil samples.

- All gross contamination and residual soils were removed by wiping with a moist towel or wire brush.

6" x 16"
Reinforced
Concrete
Block
Walls



--- 4" Diameter slotted plastic pipe (bottom layer)

— 4" Diameter slotted plastic pipe (top layer and risers)

SCALE:



FIGURE 2-8

**As-Built Soil Venting Pile
O'Henry Dry Cleaners Soil Remediation**

- Any equipment that came into contact with the soil sample was thoroughly washed internally and externally with a brush and warm water and non-phosphatic laboratory grade detergent.
- All washed equipment were rinsed thoroughly with clean tap water, followed by a rinse with reagent grade hexane or methanol where hexane was not available (see variance log in Appendix A) and a second rinse with tap water.
- The cleaned equipment was wrapped in either clean plastic or aluminum foil for storage and handling until used to collect a sample.

All equipment used for soil excavation and stockpiling were decontaminated by steam cleaning at the beginning and end of the soil remediation. The equipment was decontaminated by steam-cleaning at a steam temperature of 220°F and pressure of 1,000 pounds per square inch (psi) with potable water.

2.5 Investigation-Derived Waste

All personnel protective equipment and waste plastic sheeting were double-bagged and disposed of in a sanitary landfill. A decontamination area was constructed by lining an appropriate area with 4-millimeter plastic sheeting. Straw bales were placed around the perimeter of the area (beneath the sheeting) to contain runoff, which was collected in a shallow sump. The fluids were pumped from the sump to a 55-gallon DOT approved drum. This was stored in a secure location at the O'Henry Laundry. The drum was labelled to indicate contents and volume. Pending chemical analysis and approval of the DPNR, decontamination water will be disposed in the sanitary sewer.

2.6 Variances from the Approved Work Plan

The following variances were recorded during soil remediation activities:

- Due to the shallow depth at which bedrock was encountered, soil boring ITSB01 was drilled to auger refusal at a depth of 15 feet. It was anticipated that bedrock would be encountered at a depth of 25 feet.
- A soil venting pile was constructed as a passive soil treatment alternative to drumming the soil for later treatment (Section 2.3).
- Due to rocky soil conditions, which impeded sampling with a hand auger, some soil samples were collected with a stainless steel trowel.

As a result of a late arriving shipment of laboratory and monitoring supplies, the following variances were recorded during the first 2 days of the soil remediation field efforts (March 6 and 7, 1995):

- A photoionization detector (PID) and explosimeter were not available at the site during the installation of boring ITSB01.
- Nonlaboratory grade deionized water was used in place of laboratory grade deionized water.
- Methanol was used for equipment decontamination instead of hexane.

Variance logs and the appropriate steps taken to obtain appropriate approvals are included in Appendix A.

3.0 Soil Analytical Results

3.1 Field Screening Analytical Results

Field screening analytical results are presented in Table 3-1 and on Figures 2-3 through 2-7. One out of the three samples collected during installation of boring ITSB01 was found to contain PCE concentrations above detection limits. A PCE concentration of 238 $\mu\text{g/kg}$ was detected in the sample collected at a depth of 5 feet below ground surface. PCE concentrations were below detection limits in samples collected at depth intervals of 10 feet and 14.5 feet below ground surface.

All samples collected during the excavation contained PCE concentrations above detection limits. PCE concentrations ranged from 9.8 to 2,845 $\mu\text{g/kg}$. Twelve out of the thirty-five samples from the excavation area contained PCE concentrations above the threshold concentration of approximately 200 $\mu\text{g/kg}$ recommended by the EPA. Only four screening samples exceeded the 328 $\mu\text{g/kg}$ cleanup standard developed for the site by IT. PCE concentrations of 214 and 324 $\mu\text{g/kg}$ were detected at a depth of 1 to 2 feet in EXS-01 and EXS-04, respectively. PCE concentrations of 254, 412, and 2,845 $\mu\text{g/kg}$ were found at a depth of 3 to 4 feet in EXS-10, EXS-11, and EXS-12, respectively. PCE concentrations of 274, 341, and 454 $\mu\text{g/kg}$ were detected at a depth of 6 feet in EXS-15, EXS-16, and EXS-17, respectively.

Field screening analytical results indicated that three samples from the wall adjacent to the concrete slab contained PCE concentrations above the EPA provisional cleanup level of 200 $\mu\text{g/kg}$. PCE concentrations of 275, 220, and 242 $\mu\text{g/kg}$ were detected in EXS-23, EXS-26, and EXS-28, respectively. However, due to physical limitations, it was not possible to remove any more soils; therefore, excavation was terminated.

Field GC analysis of all samples collected at a depth of 8 feet indicated that PCE concentrations were below 200 $\mu\text{g/kg}$; therefore, the excavation was terminated. Field GC analysis on the backfill material (Devcon 1) indicated that the fill was clean (Table 3-1).

3.2 Confirmation Samples Results

Confirmation soil samples from soil boring ITSB-01, the excavation floor, walls, and the first "lift" and QC samples were analyzed at a fixed base laboratory for EPA's target analyte list VOCs according to CLP March 1990 SOW. Analytical results presented in Table 3-2 and on Figures 2-3 through 2-7 indicated the presence of PCE, trichloroethane, 1,1,2 trichloroethane,

TABLE 3-1

Summary of Field Screening Analytical Results
O'Henry Laundry
Tutu, St. Thomas, U.S. Virgin Islands
IT Project Number 409830.002

Sample Number	Collected		Analyzed		Coordinates (Feet)					PCE µg/kg	Lab Qual.
	Date	Time	Date	Time	x ^a	y ^a	z ^b				
IT-SB-01-05.0	6-Mar-95	2:20 PM	7-Mar-95	12:21 PM	7.00	4.00	5.00	-	5.60	237.69	U ¹ U U
IT-SB-01-14.5	6-Mar-95	3:35 PM	7-Mar-95	1:12 PM	7.00	4.00	14.50	-	15.00	12.38	
IT-SB-01-10.0	6-Mar-95	3:10 PM	7-Mar-95	1:37 PM	7.00	4.00	10.00	-	10.50	4.33	
IT-SB-01-10.0-DP	6-Mar-95	3:10 PM	7-Mar-95	2:04 PM	7.00	4.00	10.00	-	10.50	4.98	
EXS-01	7-Mar-95	12:35 PM	7-Mar-95	3:48 PM	3.00	6.00	1.00	-	2.00	214.40	B ²
EXS-02	7-Mar-95	1:00 PM	7-Mar-95	4:19 PM	6.00	0.00	1.00	-	2.00	197.26	B
EXS-03	7-Mar-95	1:20 PM	7-Mar-95	4:49 PM	9.00	0.00	1.00	-	2.00	181.34	B
EXS-04	7-Mar-95	1:45 PM	7-Mar-95	5:53 PM	3.00	4.50	2.00	-	3.00	324.09	B
EXS-05	7-Mar-95	2:05 PM	7-Mar-95	7:10 PM	9.00	5.00	1.00	-	2.75	83.95	B
EXS-06	8-Mar-95	8:40 AM	8-Mar-95	11:36 AM	6.00	6.75	2.00	-	3.00	9.81	E ³
EXS-07	8-Mar-95	9:15 AM	8-Mar-95	12:02 PM	1.00	4.00	2.00	-	2.75	171.78	
EXS-08	8-Mar-95	9:30 AM	8-Mar-95	12:29 PM	2.00	7.50	3.00	-	3.25	189.10	
EXS-09	8-Mar-95	9:40 AM	8-Mar-95	1:05 PM	11.00	0.00	1.00	-	1.25	70.20	
EXS-10	8-Mar-95	11:35 AM	8-Mar-95	1:34 PM	1.00	2.00	2.75	-	3.00	254.20	
EXS-11	8-Mar-95	11:40 AM	8-Mar-95	2:27 PM	5.50	0.50	3.00	-	3.25	412.31	
EXS-12	8-Mar-95	11:45 AM	8-Mar-95	3:45 PM	10.30	-1.50	3.75	-	4.00	2844.90	
EXS-13	8-Mar-95	12:00 AM	8-Mar-95	4:42 PM	1.25	7.50	3.75	-	4.00	101.84	
EXS-14	8-Mar-95	12:05 PM	8-Mar-95	5:07 PM	9.00	5.00	3.75	-	4.00	136.02	
EXS-15	8-Mar-95	2:50 PM	9-Mar-95	2:36 AM	7.00	-2.50	6.00	-	6.25	274.15	
EXS-16	8-Mar-95	3:00 PM	9-Mar-95	3:00 AM	5.00	1.75	7.00	-	7.25	341.22	
EXS-17	8-Mar-95	3:15 PM	9-Mar-95	5:22 AM	1.50	3.50	6.00	-	6.25	454.18	
EXS-18	8-Mar-95	3:30 PM	9-Mar-95	5:46 AM	5.50	6.25	6.50	-	6.75	34.20	
EXS-19	8-Mar-95	4:00 PM	9-Mar-95	6:09 AM	2.50	12.00	2.25	-	2.50	71.89	

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TABLE 3-1

**Summary of Field Screening Analytical Results
O'Henry Laundry
Tutu, St. Thomas, U.S. Virgin Islands
IT Project Number 409830.002**

Sample Number	Collected		Analyzed		Coordinates (Feet)					PCE µg/kg	Lab Qual.
	Date	Time	Date	Time	x ^a	y ^a	z ^b				
EXS-20	8-Mar-95	4:10 PM	9-Mar-95	6:30 AM	2.75	9.50	2.50	-	2.75	62.42	
EXS-21	8-Mar-95	4:15 PM	9-Mar-95	7:29 AM	11.66	0.00	5.50	-	5.75	133.71	
EXS-22	8-Mar-95	4:20 PM	9-Mar-95	11:06 AM	9.00	3.25	6.00	-	6.25	28.40	
EXS-23	9-Mar-95	12:00	9-Mar-95	3:59 PM	10.00	-3.75	4.00	-	4.25	275.38	
EXS-24	9-Mar-95	12:10	9-Mar-95	4:24 PM	10.00	-2.33	6.33	-	7.33	57.80	
EXS-25	9-Mar-95	12:50	9-Mar-95	4:46 PM	5.50	-2.75	4.00	-	4.25	173.90	
EXS-26	9-Mar-95	13:10	10-Mar-95	2:43 AM	6.00	-0.50	6.00	-	6.25	220.33	
EXS-27	9-Mar-95	13:55	10-Mar-95	3:07 AM	2.00	2.33	5.75	-	6.00	195.14	
EXS-28	9-Mar-95	14:10	10-Mar-95	3:30 AM	1.25	2.00	4.25	-	4.50	242.71	
EXS-29	9-Mar-95	14:50	10-Mar-95	3:52 AM	-1.50	5.00	5.00	-	5.25	171.46	
EXS-30	9-Mar-95	15:35	10-Mar-95	4:16 AM	4.25	-0.50	5.33	-	5.58	155.45	
EXS-31	9-Mar-95	15:55	10-Mar-95	5:15 AM	3.75	-1.25	3.75	-	4.00	169.41	
EXS-32	9-Mar-95	16:15	10-Mar-95	5:38 AM	2.00	10.00	2.00	-	3.00	63.61	
EXS-33	9-Mar-95	16:27	10-Mar-95	6:01 AM	8.25	-0.75	8.00	-	8.50	15.17	
EXS-34	9-Mar-95	16:04	10-Mar-95	6:50 AM	6.00	3.00	8.00	-	8.50	74.60	
EXS-35	9-Mar-95	17:00	10-Mar-95	7:18 AM	3.25	3.50	8.00	-	8.50	109.65	
Devcon1	9-Mar-95	18:24	10-Mar-95	9:36 AM	na	na	na	na	5.00		U
Devcon1-DP	9-Mar-95	18:24	10-Mar-95	10:05 AM	na	na	na	na	5.00		U

^a X and Y coordinates are referenced to the northwest corner of the Liquor Barn. The X direction corresponds approximately to the north. The Y direction corresponds approximately to west.

^b The Z coordinate (depth) is referenced to the top of the concrete paving between the Liquor Barn and O'Henry Laundry.

¹ U - Not detected.

² B - Detected in associated field laboratory blank.

³ E - Estimated concentration exceeding calibration range.

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TABLE 3-2

**Summary of CLP Analytical Results
O'Henry Laundry
Tutu, St. Thomas, U.S. Virgin Islands
IT Project Number 409830.002**

Sample Number	Parameter	Concentration µg/kg	Validation Qualifier
IT-SB-01-05.0	Tetrachloroethene	120	
IT-SB-01-10.0	Tetrachloroethene	2	J
IT-SB-01-14.5	Tetrachloroethene	11	U
TB030695	Tetrachloroethene	11	U
ESX-01	Tetrachloroethene	140	D
	Trichloroethene	2	J
EXS-02	Benzene	18	
	Tetrachloroethene	120	
	Toluene	12	J
	Xylenes (total)	3	J
EXS-03	Tetrachloroethene	54	
EXS-04	Chloromethane	1	J
	Toluene	1	J
	Tetrachloroethene	100	D
EXS-05	Tetrachloroethene	100	
EXS-23	Tetrachloroethane	290	D
EXS-24	Tetrachloroethane	21	
	Toluene	1	J
EXS-25	Tetrachloroethene	190	
EXS-26	Tetrachloroethene	300	D
	Toluene	2	J
EXS-27	Tetrachloroethene	650	D
	Benzene	2	J
	Toluene	4	J
EXS-27DU	Tetrachloroethene	576	D
	Toluene	2	J

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TABLE 3-2

**Summary of CLP Analytical Results
O'Henry Laundry
Tutu, St. Thomas, U.S. Virgin Islands
IT Project Number 409830.002**

Sample Number	Parameter	Concentration $\mu\text{g/kg}$	Validation Qualifier
EX-28	Tetrachloroethene	210	D
EXS-29	Tetrachloroethene	150	D
	Toluene	4	J
EXS-30	1,1,2-Trichloroethane	8	J
	Tetrachloroethene	~~1100~~	
EXS-31	Trichloroethane	3	J
	Tetrachloroethene	~~500~~	D
	Toluene	2	J
EXS-32	Tetrachloroethene	38	
	Toluene	4	J
EXS-33	Benzene	2	J
	Tetrachloroethene	31	
	Toluene	1	J
EXS-34	Tetrachloroethene	170	
	Toluene	2	J
EXS-35	Benzene	4	J
	Tetrachloroethene	160	
	Toluene	10	J
FBMAR995	1,2-Dichloroethane	1	J
TBMAR995	1,2-Dichloroethane	1	J
DCWMAR1095	Acetone	45	J
	Chloromethane	6	J
EQUIPMENTRIN	Acetone	1	J
	1,2-Dichloroethane	1	J

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chloromethane, benzene, toluene, and total xylenes. PCE concentrations ranged from 2 µg/kg in IT-SB-01-10.0 to 1,100 µg/kg in EXS-30. Trichloroethane was detected in only two samples. Samples EXS-01 and EXS-31 were found to contain trichloroethane at estimated concentrations of 2 and 3 µg/kg, respectively. 1,1,2-Trichloroethane was detected at an estimated concentration of 8 µg/kg in EXS-30. Chloromethane was detected in sample EXS-04 at an estimated concentration of 1 µg/kg. Benzene concentrations ranging from 2 µg/kg (estimated) to 18 µg/kg were found in four samples. Toluene concentrations ranged from estimated concentrations of 1 µg/kg in EXS-04 to 12 µg/kg in EXS-02. Total xylenes were found at an estimated concentration of 3 µg/kg in EXS-02. The analytical validation packages are included in Appendix A.

All samples collected from soil boring ITSB-01 and the first "lift" contained PCE concentrations that were below the threshold value of 200 µg/kg. Only the soil sample from a 5-foot depth in boring ITSB-01 contained PCE above the detection limit. Three samples collected from the excavation walls, EXS-23, EXS-26, and EXS-28 showed PCE concentrations above 200 µg/kg, similar to the field GC analytical results. Confirmation results indicated that three additional samples from the excavation walls, EXS-27, EXS-30, and EXS-31, contained PCE concentrations above 200 µg/kg. Field GC analysis had showed these samples to contain PCE concentrations below the cleanup level of 200 µg/kg. The samples were collected from the area located adjacent to or beneath concrete paving between the O'Henry Laundry and the Liquor Barn (Figure 2-7).

Fixed laboratory sample results confirmed that the excavation floor soils were below the threshold value of 200 µg/kg. Therefore, all soils with PCE contamination beneath the unpaved area had been excavated.

EPA split sample results are presented in Table 3-3. Four of the EPA split samples showed PCE concentrations that were above the cleanup level of 200 µg/kg. Samples EXS-25, EXS-28, EXS-30, and EXS-31 showed estimated PCE concentrations of 210, 220, 480, and 630 µg/kg, respectively. These samples showed PCE concentrations that were approximately the same as the IT confirmation results, except for sample EXS-30 where the IT confirmation sample result was approximately twice the EPA split sample results. The samples were collected from the north wall located adjacent to the concrete slab where excavation was terminated due to physical limitations.

Table 3-3

**Summary of EPA Split Sample Results
O'Henry Laundry
Tutu, St. Thomas, U.S. Virgin Islands
IT Project Number 409830**

Sample Number	Parameter	Result (µg/kg)
EXS023	Acetone	21J
	1,2-Dichloroethane	2J
	2-Hexanone	36J
	4-Methyl-2-pentanone	43J
	Bromoform	2J
	Tetrachloroethene	100J
	Xylenes (total)	2J
EXS024	Tetrachloroethene	2J
EXS025	Acetone	4J
	Tetrachloroethene	210J
EXS028	Acetone	9J
	Tetrachloroethene	220J
EXS030	Methylene chloride	2J
	Acetone	45J
	2-Hexanone	3J
	Tetrachloroethene	480J
EXS031	Acetone	51J
	Trichloroethene	4J
	Tetrachloroethene	630J
EXS032	Acetone	15J
	2-Hexanone	9J
	4-Methyl 1-2-pentanone	7J
	Tetrachloroethene	34J
EXS033	Tetrachloroethene	30J
EXS034	Acetone	10J
	Tetrachloroethene	30J

Notes:

J - Estimated concentration

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3.3 Geotechnical Testing

Two geotechnical samples were collected from borehole ITSB01. Samples were tested for permeability, porosity, density, moisture content, grain size, and fractional organic content. Results of the geotechnical testing are included in Appendix A. These results indicate that the soils in the vadose zone at the site have a vertical permeability of 1.7×10^{-7} centimeters per second (cm/s). Particle size with hydrometer analysis results indicated a fine sand with traces of silt. The soil was calculated to have a moisture content of 11.8 percent, a bulk density of 107.09 pounds per cubic foot (pcf), and a dry density of 95.76 pcf. Results indicated porosity of 44.76 percent and a fractional organic content of 0.015.

4.0 Soil Remediation Progress Sampling and Operations and Maintenance of Soil Venting Pile

4.1 Quarterly Soil Sampling

Soil sampling of the venting pile will be conducted on a quarterly basis for a period of one year to monitor the progress of the soil remediation and to determine when the soils can be considered clean. The soil pile consists of two soil layers with each layer divided into quadrants by the venting pipes (Section 2.3). One discrete soil sample will be collected from the approximate center of each quadrant in each layer with the depth of the sample to be determined as described below during each sampling event. A total of eight samples will be collected from the soil pile per sampling event. In order to ensure reliability of field sampling procedures and materials, quality control (QC) samples will be collected or prepared. QC samples will include one field duplicate, one trip blank and an equipment rinsate sample per sampling event. Samples will be analyzed for EPA's target analyte list VOCs according to EPA's CLP March 1990 SOW. All data will be validated.

It is anticipated that stainless steel bucket augers will be used for soil sample collection. Samples will be collected continuously through each layer at each location and headspace measured for VOCs using a PID or FID. The sample exhibiting the most elevated PID or FID reading for each layer at each location will be sent to the laboratory for analysis. Soil removed from the pile, but not sent to the laboratory for analysis will be placed back in the pile at the location from which it was removed. Decontamination procedures for soil sample collection equipment will be similar to the procedures followed during soil remediation effort in accordance with the work plan for evaluation and interim soil remediation (IT, 1994). Sampling will be conducted in accordance with the health and safety plan included in Appendix A of the soil remediation work plan (IT, 1994).

A letter report with validated data will be transmitted to the EPA within two months after each sampling event. If, at the end of the four quarters of soil sampling, the soils are shown to have concentrations less than the provisionally accepted cleanup level of 200 µg/kg (or as determined by the EPA), then the soil venting will be considered complete and no further soil sampling will be required.

4.2 Operations and Maintenance

During quarterly soil sampling activities, the walls, roof and other components of the soil venting pile structure will be examined. If repairs are needed, these shall be recommended to L'Henri at the time they are noticed. Since the soil venting pile is a passive system no other operations or maintenance activities are anticipated.

5.0 Conclusions and Recommendations

Soil remediation efforts have removed the source of potential groundwater contamination at the O'Henry Laundry site. Soils that contained PCE concentrations above the provisional cleanup level recommended by the EPA of 200 µg/kg were excavated and a soil venting pile was constructed at the site. Because of the low PCE concentrations found in the soils during excavation activities, it is anticipated that passive soil venting to the atmosphere will be sufficient to volatilize PCE from the soil. Residual PCE concentration in soils remaining in place beneath the edge of the concrete paving appears to be an unlikely source of continuing groundwater contamination based on several lines of evidence:

- The volume of residual contamination appears to be restricted to a relatively small area immediately beneath the margin of the concrete paving. Data obtained from soil boring ITSB-01 and from the excavated soils show that peak concentrations occur near the edge of the paved surface between depths of approximately 4 and 6 feet. Concentrations in the excavated area decreased drastically with lateral distance from the paved area and with depth. Also, a previous soil boring (SB12 in Figure 1-1) was drilled through the paved area approximately 25 feet east of the excavated area. As discussed in Section 1.1.1, PCE was not detected in this boring, indicating that soil containing elevated PCE concentration is not extensive beneath the paved area.
- Although PCE concentrations in several confirmation samples from the trench wall beneath the edge of the paved area exceeded 200 µg/kg, they did so by, at most, a factor of approximately five. This may mean that the average concentration of PCE in the volume of soil from which the samples were obtained is nearly equal to the cleanup standard. It should be noted that the cleanup standard is based on vadose zone modeling in which PCE is hypothesized to be distributed throughout the vertical extent of the vadose zone from the ground surface to the water table. Based on the data collected during the soil remediation, the actual vertical extent of contamination appears restricted to an approximately 2-foot-thick zone that is approximately 16 feet above the water table. Concentrations in such a zone would need to be much higher than 200 µg/kg to result in detectable concentrations of PCE in groundwater.
- An effective migration pathway for the transport of residual PCE beneath the edge of the paved area may not exist. Vadose zone modeling used to estimate the PCE cleanup levels incorporate assumed or estimated groundwater recharge resulting from infiltration of precipitation through unpaved soil. Because the area overlying the locations of the samples with PCE concentrations exceeding 200 µg/kg is paved, infiltration, and hence, potential migration of PCE would be reduced. Reduced infiltration rates would tend to increase the minimum concentrations (cleanup level) necessary for detectable groundwater contamination.

Soil Boring ITSB-01 was targeted into the location where previous soil samples had indicated the highest PCE concentrations. Soil samples from this boring indicate lower concentrations than previously detected. In addition, samples from boring ITSB-01 indicate PCE concentrations below detection level from the 10-foot depth and below. This confirms that excavation of soils to 8-foot depth has removed all PCE-contaminated soils.

Based on the conclusions, it is recommended that no further in situ remediation be performed at the site.

Quarterly soil sampling of the soil venting pile will take place for a period of 1 year to monitor the progress of the ex situ soil remediation.

6.0 References

Geraghty and Miller, Inc. 1993, *Technical Memorandum II, Results of the Field Program, Tutu Service Station Investigation, St. Thomas, U.S. Virgin Islands.*

IT Corporation, 1994, *Work Plan for Evaluation and Interim Remediation of Soils, O'Henry Laundry, Tutu, St. Thomas, U.S. Virgin Islands.*

U.S. Environmental Protection Agency (EPA), 1995, Administrative Order on Consent for Removal Action No. II-CERCLA-95-0401.

APPENDIX A

VISUAL CLASSIFICATION OF SOILS - BORING LOGS

FIELD GAS CHROMATOGRAPHY SCREENING ACTIVITIES

VARIANCE LOGS

VALIDATED ANALYTICAL RESULTS

GEOTECHNICAL TESTING RESULTS

VISUAL CLASSIFICATION OF SOILS - BORING LOGS

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 409830.002				PROJECT NAME: L'HENRI Soil Remediation			
BORING NUMBER: Excavation				COORDINATES:		DATE: 3/10/95	
ELEVATION:				GWL DEPTH:		DATE:	
ENGINEER/GEOLOGIST: K. Loy				GWL DEPTH:		DATE:	
DRILLING METHODS: BACKHOE						PAGE 1 OF 1	

Depth (ft.)	Sample No. & Time	Blows On Sampler Per (6")	Recovery (ft.)	DESCRIPTION	USCS SYMBOL	Measured Consistency (TSF)	REMARKS
0				Moderate yellow brown (10 YR 5/4), sandy SILT with clay, slightly moist, plastic, sand fraction angular to subangular igneous rock fragments, highly weathered, discrete bodies of organic material up to 8" diameter. Layer is massive, contains manmade debris, nails, wire, wood, 1/2" thick caliche at base, continuous. (See next description).	ml (fill)		
2							
4				Olive gray (5 Y 3/2), SILT, thinly laminated, forms continuous layer (caliche). Moderate yellow brown (10 YR 5/4), sandy SILT with clay, slightly moist, plastic, sand fraction as above, weakly stratified, root zone at base.	ml		
6				Light brown (5 YR 6/4), sandy SILT with clay, slightly moist, increasing sand content with depth, light olive gray (5 Y 5/2), andesite boulders and cobbles starting at 6 feet.	ml		
8							
10				Base of Excavation (Fractured Bedrock - Not Rippable with Backhoe)			
12							

NOTES:
 Depth measured from concrete slab:
 Vertical Scale: 1" = 2'
 Logged from vertical face at excavation
 directly beneath concrete slab

**INTERNATIONAL
TECHNOLOGY
CORPORATION**

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 409830.002		PROJECT NAME: L'HENRI Soil Remediation	
BORING NUMBER: ITSB01		COORDINATES:	DATE: 3/6/95
ELEVATION:		GWL DEPTH: DATE:	DATE STARTED: 3/6/95
ENGINEER/GEOLOGIST: K. Loy		GWL DEPTH: DATE:	DATE COMPLETED: 3/6/95
DRILLING METHODS: 6" HOLLOW STEM AUGER; 18" X 1.5" I.D. SPLIT SPOON; 140 LB HAMMER			PAGE 1 OF 1

Depth (ft.)	Sample No. & Time	Blows On Sampler Per (6")	Recovery (ft.)	DESCRIPTION	USCS SYMBOL	Measured Consistency (TSF)	REMARKS
0							
	ITSB -05.0 1420	3/3/4	8"	Moderate yellow brown (10 YR 5/4), sandy SILT with clay, slightly moist, plastic, sand fraction angular to subangular volcanic rock fragments - highly weathered, discrete bodies of organic matter	ml (Fill)		Split sample: CLP VOC/Field GC
5	LH01 1435						Shelby Tube
	LH02 1440	7/25/16	10"	Light brown (5 YR 6/4), sandy SILT with clay, moist, grading to andesite, light olive gray (5 Y 5/24), weathered, disseggregated, dry	ml		16 oz. geotechnical
	ITSB -10.0 1510	23/55/74	12"		weath. And.		Split sample: CLP VOC/Field GC
10				Dusky yellow green (5GY 5/2), andesite, fractured, unweathered, dry	And.		
	ITSB -14.5 1535	58/79/R	8"	Light olive gray (5 Y 5/2) silty fine SAND, some clay, dry, appears derived from weathered bedrock (See footnote)	sm		Split sample: CLP VOC/Field GC
15				Auger Refusal at 15 Ft.	And		Attempted shelly tube sample - refusal on rock - bent shelly tube
20							
25							
30							

NOTES:

Drilling Contractor: Caribbean Drilling Services, St. Croix, USVI
 Driller: Denzel Dawkins
 Helper: Shawn McConnel, Wesley Jameson - Caribbean Hydrotech.
 sm - In situ material probably retains bedrock structure, disaggregates on sampling
 And. - Andesite Weath. And. - Weathered Andesite



ITSB01/LHENRI/drw/mc/3-27-95

TUT 007 1682

FIELD GAS CHROMATOGRAPHY SCREENING ACTIVITIES

Field Analytical Activities at the O'Henry Laundry Site

1.0 Narrative of Events

A field chemist was mobilized from Quanterra Environmental Services Field Analytical Services (FAS) group to St. Thomas, U.S. Virgin Islands (USVI), on March 5, 1995, to analyze soils at the O'Henry Laundry Site for tetrachloroethene (PCE). The equipment that was mobilized included two gas chromatographs (GC), two portable computers, two dot matrix printers, an analytical balance, and miscellaneous laboratory supplies. Extremely small volume standards were transported with the equipment in accordance with applicable safety regulations. Larger volumes of solvents were transported by ship from Puerto Rico.

The required instrumentation was set up in a rental van parked near the site on Monday, March 6, 1995. The purpose of the March 6 activities was to calibrate the gas chromatograph under field conditions. Five-point calibration was accomplished in the field, but trap and oven cool down times were extremely long. Heat transfer to warm air is not efficient, and the cool down time was extended by the warm climate at the site. A decision was made to set up the equipment in an air conditioned hotel room effective March 7, prior to analyzing any samples.

Samples were collected on March 6 through March 9, 1995. The samples collected on March 6 were collected from soil boring IT-SB-01, and most subsequent samples were collected from the floor and walls of an excavation as described in the geologist's field logs. One sample of fill soil was obtained and screened for tetrachloroethene. The samples were analyzed from March 7 to March 10, 1995, when the laboratory was demobilized and returned to Knoxville. The analytical results are presented in Table 1.

All samples were analyzed using a GC SRI Model 8610 equipped with a photoionization detector and a built in chemical trap containing Tenax absorbent. A thick film, nonpolar chromatographic column was used to separate PCE from earlier eluting analytes and the surrogate compound, 2-chlorotoluene (CT). Air supplied by an in-board pump was filtered to remove hydrocarbon impurities and used as the GC carrier gas.

TABLE 1

Summary of Field Screening Analytical Results
O'Henry Laundry
Tutu, St. Thomas, U.S. Virgin Islands
IT Project Number 409830.002

Sample Number	Collected		Analyzed		Coordinates (Feet)					PCE μg/kg	Lab Qual.
	Date	Time	Date	Time	x ^a	y ^a	z ^b				
IT-SB-01-05.0	6-Mar-95	2:20 PM	7-Mar-95	12:21 PM	7.00	4.00	5.00	-	5.60	237.69	U ¹ U U
IT-SB-01-14.5	6-Mar-95	3:35 PM	7-Mar-95	1:12 PM	7.00	4.00	14.50	-	15.00	12.38	
IT-SB-01-10.0	6-Mar-95	3:10 PM	7-Mar-95	1:37 PM	7.00	4.00	10.00	-	10.50	4.33	
IT-SB-01-10.0-DP	6-Mar-95	3:10 PM	7-Mar-95	2:04 PM	7.00	4.00	10.00	-	10.50	4.98	
EXS-01	7-Mar-95	12:35 PM	7-Mar-95	3:48 PM	3.00	6.00	1.00	-	2.00	214.40	B ²
EXS-02	7-Mar-95	1:00 PM	7-Mar-95	4:19 PM	6.00	0.00	1.00	-	2.00	197.26	B
EXS-03	7-Mar-95	1:20 PM	7-Mar-95	4:49 PM	9.00	0.00	1.00	-	2.00	181.34	B
EXS-04	7-Mar-95	1:45 PM	7-Mar-95	5:53 PM	3.00	4.50	2.00	-	3.00	324.09	B
EXS-05	7-Mar-95	2:05 PM	7-Mar-95	7:10 PM	9.00	5.00	1.00	-	2.75	83.95	B
EXS-06	8-Mar-95	8:40 AM	8-Mar-95	11:36 AM	6.00	6.75	2.00	-	3.00	9.81	E ³
EXS-07	8-Mar-95	9:15 AM	8-Mar-95	12:02 PM	1.00	4.00	2.00	-	2.75	171.78	
EXS-08	8-Mar-95	9:30 AM	8-Mar-95	12:29 PM	2.00	7.50	3.00	-	3.25	189.10	
EXS-09	8-Mar-95	9:40 AM	8-Mar-95	1:05 PM	11.00	0.00	1.00	-	1.25	70.20	
EXS-10	8-Mar-95	11:35 AM	8-Mar-95	1:34 PM	1.00	2.00	2.75	-	3.00	254.20	
EXS-11	8-Mar-95	11:40 AM	8-Mar-95	2:27 PM	5.50	0.50	3.00	-	3.25	412.31	
EXS-12	8-Mar-95	11:45 AM	8-Mar-95	3:45 PM	10.30	-1.50	3.75	-	4.00	2844.90	
EXS-13	8-Mar-95	12:00 AM	8-Mar-95	4:42 PM	1.25	7.50	3.75	-	4.00	101.84	
EXS-14	8-Mar-95	12:05 PM	8-Mar-95	5:07 PM	9.00	5.00	3.75	-	4.00	136.02	
EXS-15	8-Mar-95	2:50 PM	9-Mar-95	2:36 AM	7.00	-2.50	6.00	-	6.25	274.15	
EXS-16	8-Mar-95	3:00 PM	9-Mar-95	3:00 AM	5.00	1.75	7.00	-	7.25	341.22	
EXS-17	8-Mar-95	3:15 PM	9-Mar-95	5:22 AM	1.50	3.50	6.00	-	6.25	454.18	
EXS-18	8-Mar-95	3:30 PM	9-Mar-95	5:46 AM	5.50	6.25	6.50	-	6.75	34.20	
EXS-19	8-Mar-95	4:00 PM	9-Mar-95	6:09 AM	2.50	12.00	2.25	-	2.50	71.89	

TUT 007 1685

TABLE 1

**Summary of Field Screening Analytical Results
O'Henry Laundry
Tutu, St. Thomas, U.S. Virgin Islands
IT Project Number 409830.002**

Sample Number	Collected		Analyzed		Coordinates (Feet)					PCE μg/kg	Lab Qual.
	Date	Time	Date	Time	x ^a	y ^a	z ^b				
EXS-20	8-Mar-95	4:10 PM	9-Mar-95	6:30 AM	2.75	9.50	2.50	-	2.75	62.42	U U
EXS-21	8-Mar-95	4:15 PM	9-Mar-95	7:29 AM	11.66	0.00	5.50	-	5.75	133.71	
EXS-22	8-Mar-95	4:20 PM	9-Mar-95	11:06 AM	9.00	3.25	6.00	-	6.25	28.40	
EXS-23	9-Mar-95	12:00	9-Mar-95	3:59 PM	10.00	-3.75	4.00	-	4.25	275.38	
EXS-24	9-Mar-95	12:10	9-Mar-95	4:24 PM	10.00	-2.33	6.33	-	7.33	57.80	
EXS-25	9-Mar-95	12:50	9-Mar-95	4:46 PM	5.50	-2.75	4.00	-	4.25	173.90	
EXS-26	9-Mar-95	13:10	10-Mar-95	2:43 AM	6.00	-0.50	6.00	-	6.25	220.33	
EXS-27	9-Mar-95	13:55	10-Mar-95	3:07 AM	2.00	2.33	5.75	-	6.00	195.14	
EXS-28	9-Mar-95	14:10	10-Mar-95	3:30 AM	1.25	2.00	4.25	-	4.50	242.71	
EXS-29	9-Mar-95	14:50	10-Mar-95	3:52 AM	-1.50	5.00	5.00	-	5.25	171.46	
EXS-30	9-Mar-95	15:35	10-Mar-95	4:16 AM	4.25	-0.50	5.33	-	5.58	155.45	
EXS-31	9-Mar-95	15:55	10-Mar-95	5:15 AM	3.75	-1.25	3.75	-	4.00	169.41	
EXS-32	9-Mar-95	16:15	10-Mar-95	5:38 AM	2.00	10.00	2.00	-	3.00	63.61	
EXS-33	9-Mar-95	16:27	10-Mar-95	6:01 AM	8.25	-0.75	8.00	-	8.50	15.17	
EXS-34	9-Mar-95	16:04	10-Mar-95	6:50 AM	6.00	3.00	8.00	-	8.50	74.60	
EXS-35	9-Mar-95	17:00	10-Mar-95	7:18 AM	3.25	3.50	8.00	-	8.50	109.65	
Devcon1	9-Mar-95	18:24	10-Mar-95	9:36 AM	na	na	na			5.00	
Devcon1-DP	9-Mar-95	18:24	10-Mar-95	10:05 AM	na	na	na			5.00	

^a X and Y coordinates are referenced to the northwest corner of the Liquor Barn. The X direction corresponds approximately to the north. The Y direction corresponds approximately to west.

^b The Z coordinate (depth) is referenced to the top of the concrete paving between the Liquor Barn and O'Henry Laundry.

¹ U - Not detected.

² B - Detected in associated field laboratory blank.

³ E - Estimated concentration exceeding calibration range.

2.0 Quality Assurance Activities

Statistical analyses of all recovery data are presented in Table 2. Percent recovery averages and standard deviations are presented for continuing calibrations, matrix spikes, and surrogates. The allowed range of value, for a 95 percent confidence interval is also calculated.

2.1 Calibration

A five-point calibration curve was generated on March 6, 1995. Continuing calibration standards were run at least daily as shown in Table 3. The continuing calibration standard that was run on the morning of March 9 was considered to be too divergent from the initial calibration curve. Four more standards were analyzed to provide raw data with which to calculate a new five-point calibration for PCE, and a four-point calibration for CT. A final continuing calibration standard was run on March 10 to indicate that the test method remained in control. The average PCE recovery for the continuing calibration standards was 98.7 percent, with a standard deviation of 1.9 percent. The upper and lower limits of the population of recoveries predicted by these standards were 95 percent and 102.5 percent, respectively, at a 95 percent confidence interval. The surrogate, 2-chlorotoluene, exhibited higher variability, but was clearly in control.

2.2 Matrix Spike Recovery

The original work plan called for three matrix spike/matrix spike duplicate (MS/MSD) pairs to be analyzed. Increases in the number of samples analyzed over the original scope of services cost time, and only two pairs of matrix spike samples were analyzed. Matrix spike data are reported in Table 4. The average recovery for PCE was 98.6 percent, with a standard deviation of 5.1 percent. Based on these results, the matrix spike recoveries would be expected to be within 88 and 109 percent recovery. The recovery data were very reproducible, with relative percent difference (RPD) of 3.3 percent and 3.8 percent. Based on these data, the accuracy and precision of the test method was in control.

2.3 Surrogate Recovery

Each sample was spiked with surrogate (CT) to monitor the test in progress. Surrogate recoveries were expected in the range of 60 to 140 percent recovery. In fact, surrogate recovery ranged from 77.3 to 132.9 percent recovery after outlier results were rejected from consideration. The results for analyses that exhibited poor recoveries were generally rejected,

TABLE 2

**Statistical Analysis of Quality Assurance Parameters
O'Henry Laundry
Tutu, St. Thomas, U.S. Virgin Islands
IT Project Number 409830.002**

Parameter	Average	Standard Deviation	95% Confidence Interval	
			Upper	Lower
<i>Continuing Calibration Standard % Recovery</i>				
Tetrachloroethene (PCE)	98.7%	1.9%	95.0%	102.5%
2-Chlorotoluene (CT,surr)	100.7%	6.6%	87.6%	113.9%
<i>Matrix Spike % Recovery</i>				
Tetrachloroethene (PCE)	98.6%	5.1%	88.3%	108.9%
<i>Surrogate % Recovery</i>				
2-Chlorotoluene (CT,surr) *	105.1%	13.9%	77.3%	132.9%

* Outlier value for IT-SB-01-10.0 was excluded.

TUT 007 1688
BB97 700

TABLE 3

SUMMARY OF FIELD SCREENING CALIBRATION DATA

O'Henry Laundry
Tutu, St. Thomas, U.S. Virgin Islands
IT Project Number 409830.002

Sample Number	Collected		Analyzed		PCE ug/kg	PCE %Recovery	CT %Recovery
	Date	Time	Date	Time			
Standard, 5ppb	na	na	6-Mar-95	2:31 PM	na	na	na
Standard, 20ppb	na	na	6-Mar-95	2:57 PM	na	na	na
Standard, 50ppb	na	na	6-Mar-95	3:29 PM	na	na	na
Standard, 100ppb	na	na	6-Mar-95	4:05 PM	na	na	na
Standard, 100ppb	na	na	6-Mar-95	4:34 PM	na	na	na
Standard, 200ppb	na	na	6-Mar-95	5:07 PM	na	na	na
CCV STD SOD	na	na	7-Mar-95	11:32 AM	50.63	101.3%	99.7%
CCV STD EOD	na	na	7-Mar-95	7:40 PM	49.53	99.1%	108.1%
CCV STD SOD	na	na	8-Mar-95	10:54 AM	48.65	97.3%	92.4%
Standard, 100/100	na	na	9-Mar-95	11:53 AM	na	na	na
Standard, 50/100	na	na	9-Mar-95	12:18 PM	na	na	na
Standard, 20/50	na	na	9-Mar-95	12:41 PM	na	na	na
Standard, 5/25	na	na	9-Mar-95	1:08 PM	na	na	na
Standard, 200/200	na	na	9-Mar-95	2:00 PM	na	na	na
CCV STD EOD	na	na	10-Mar-95	12:53 PM	48.65	97.3%	102.9%

TUT 007 1689

TABLE 4

QUALITY ASSURANCE DATA
O'Henry Laundry
Tutu, St. Thomas, U.S. Virgin Islands
IT Project Number 409830.002

Sample Number	Collected		Analyzed		Coordinates (Feet)				PCE	CT
	Date	Time	Date	Time	x	y	z(1)	z(2)	%Recovery	%Recovery
Devcon1-MS	9-Mar-95	18:24	10-Mar-95	11:19 AM	na	na	na	na	101.1%	103.0%
Devcon1-MD	9-Mar-95	18:24	10-Mar-95	11:42 AM	na	na	na	na	104.4%	109.5%
IT-EXS-06-MS	8-Mar-95	8:40 AM	10-Mar-95	12:05 PM	6.00	6.75	2.00	3.00	92.8%	97.8%
IT-EXS-06-MD	8-Mar-95	8:40 AM	10-Mar-95	12:28 PM	6.00	6.75	2.00	3.00	96.3%	96.0%

TUT 007 1690

and not reported. Samples having poor surrogate recoveries were immediately reanalyzed. The average surrogate recovery was 105.1 percent with a standard deviation of 13.9 percent.

2.4 Method Blank Contamination

Method blank data are reported in Table 5. Only one method blank exhibited any level of contamination by PCE. Method blank MBLK1 had 0.61 $\mu\text{g/L}$ PCE reported. The sample data that was associated with this blank was flagged as B (blank contamination) whenever PCE was detected. However, the blank contamination was far below the observed values for the samples, and did not affect the results.

2.5 Variances

The three variances that occurred during the analytical portion of this project were as follows:

- Two MS/MSD pairs were analyzed instead of three.
- Only two pairs of results were duplicated by the field laboratory instead of three.
- One sample should have been extracted with methanol and reanalyzed. Sample IT-EXS-12 was reported as 2844 $\mu\text{g/kg}$ E because even an 0.5-gram sample gave over-range results. The methanol that was shipped to St. Thomas was not obtained in time to extract and reanalyze the sample.

TABLE 5

SUMMARY OF BLANK DATA
O'Henry Laundry
Tutu, St. Thomas, U.S. Virgin Islands
IT Project Number 409830.002

Sample Number	Analyzed		PCE ug/kg	Lab Qual.	PCE %Recovery	CT %Recovery
	Date	Time				
SOD Blank	6-Mar-95	1:56 PM	5.00	U	na	na
SOD Blank	7-Mar-95	10:45 AM	5.00	U	na	na
MBLK1	7-Mar-95	8:09 PM	0.61	J	na	111.7%
EOD Blank	7-Mar-95	8:36 PM	5.00	U	na	0.0%
SOD Blank	8-Mar-95	10:19 AM	5.00	U	na	0.0%
MBLK2	9-Mar-95	11:29 AM	5.00	U	na	140.8%
SOD Blank	10-Mar-95	7:49 AM	5.00	U	na	0.0%
MBLK3	10-Mar-95	1:18 PM	5.00	U	na	95.1%

TUT 007 1692

3.0 Conclusions

The data obtained at the O'Henry Laundry Site were in control. One sample was reported over-range, but the value was clearly above the action level for the remediation. The field laboratory program was successful.

VARIANCE LOGS



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VARIANCE NO. 1

VARIANCE LOG

PROJECT NO. 409830.002 PAGE 1 OF 1
PROJECT NAME L'Heure Soil Remediation DATE: 3/6/95

VARIANCE (INCLUDE JUSTIFICATION)

Hexane was to be used for decontamination of split-spoon samplers. However, the Hexane shipment was delayed. Methanol was obtained at a medical supply store and was used instead of hexane, with the approval of Caroline Kwan, USEPA Region II.

APPLICABLE DOCUMENT: Work plan for Evaluation and Interim Remediation of soils, O'Henry Sanitary, Tutu, St. Thomas, U.S.V.I.

CC:

REQUESTED BY: Kenneth Lee DATE: 3/6/95

APPROVED BY: Belinda Rice DATE: 3/6/95
Project Manager

Quality Assurance Officer

DATE: _____

DATE: _____

40818-7



INTERNATIONAL
TECHNOLOGY
CORPORATION

VARIANCE NO. 2

VARIANCE LOG

PROJECT NO. 409830.002 PAGE 1 OF 1
PROJECT NAME L'Henri Soil Remediation DATE: 3/7/95

VARIANCE (INCLUDE JUSTIFICATION)

Due to a late arriving shipment of laboratory supplies, laboratory grade DI water was not available for use in equipment decontamination. Deionized water was obtained at a local grocery store. This was used for equipment decontamination on 3/6/95 and 3/7/95 with Caroline Kuwan's verbal approval.

APPLICABLE DOCUMENT:

Work Plan for Evaluation and Interim Remediation of Soils, O'Henry Landfill, Tutu, St. Thomas, U.S.V.I.

CC:

REQUESTED BY: Kenneth Lee DATE: 3/6/95
APPROVED BY: Belinda Rice DATE: 3/6/95
Project Manager

Quality Assurance Officer DATE: _____

DATE: _____

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INTERNATIONAL
TECHNOLOGY
CORPORATION

VARIANCE NO. 3

VARIANCE LOG

PROJECT NO. 409830.002 PAGE 1 OF 1
PROJECT NAME Lt. Henri Soil Remediation DATE: 3/6/95

VARIANCE (INCLUDE JUSTIFICATION)

Due to a late arriving shipment of air monitoring supplies, a PID and explosives were not available during drilling of boring ITSB01. This was discussed with Caroline Kwan, IT field staff and the drilling crew, which was not contracted to IT. All parties agreed that because of the wind speed (~10 miles/hr, steady) and age of the release, it was appropriate to proceed without monitoring equipment. Subsequent

APPLICABLE DOCUMENT:

monitoring the next day did not reveal PID concentrations greater than 1 ppm. Monitoring will continue through project completion.

Work Plan for Evaluation and Subsurface Remediation

CC: Scull, O'Henry & Associates
Tutu, St. Thomas, U.S.V.I.

REQUESTED BY: Kenneth Day DATE: 3/6/95

APPROVED BY: Boluda Dico DATE: 3/6/95
Project Manager

Quality Assurance Officer

DATE: _____

DATE: _____

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INTERNATIONAL
TECHNOLOGY
CORPORATION

VARIANCE NO. 4

VARIANCE LOG

PROJECT NO. 409830 PAGE 1 OF 1
PROJECT NAME O'Henry Soil Remediation DATE: 3/7/95

VARIANCE (INCLUDE JUSTIFICATION)

Soil Boring ITSB#1 was anticipated to be drilled to a depth of 25 feet but was terminated at meter refusal on bedrock at 14.5 feet, leaving surplus analytical budget. Five CHP VOC 3/90 samples will be collected from a depth of approximately 1 foot in the floor of the excavation. Funds for these two of these samples are available from the soil boring budget. Since sampling difficulties increase with depth, samples collected at 1 foot will increase the likelihood of adequate characterization also, ~~no~~ new funds may not be required if

APPLICABLE DOCUMENT:

samples cannot be obtained at greater depths.
Work Plan for Evaluation and Interim Remediation of Soils, O'Henry Landfill, Tutu, St. Thomas, U.S. VI.

CC:

REQUESTED BY: Ken with C. Day DATE: 3/7/95

APPROVED BY: Balanda Price DATE: 3/7/95
Project Manager SIS No. 3/21/95

Quality Assurance Officer DATE: _____

DATE: _____

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TUT 007 1698



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VARIANCE NO. 5

VARIANCE LOG

PROJECT NO. L'Henri Soil 409830.002 PAGE 1 OF 1

PROJECT NAME L'Henri Soil Remediation DATE: 3/9/95

VARIANCE (INCLUDE JUSTIFICATION)

To ~~spread~~ ^{KLL 3/9/95} sample collection ~~for~~ ^{of} samples for field CoC analysis, some samples were collected with stainless steel trowels. This sampling method was verbally approved by Caroline Kwan, EPA Region II RPM.

APPLICABLE DOCUMENT:

Work Plan for Evaluation and Interim Remediation of Soils, O'Henry Laundry, Tutu, St. Thomas

CC:

REQUESTED BY: Kenneth J. Loy DATE: 3/9/95

APPROVED BY: Belinda Rife DATE: 3/9/95
Project Manager

Quality Assurance Officer

DATE: _____

408619-7



INTERNATIONAL
TECHNOLOGY
CORPORATION

VARIANCE NO. 6

VARIANCE LOG

PROJECT NO. 409830.002

PAGE 1 OF 1

PROJECT NAME L'Henry Soil Remediation

DATE: 3/9/95

VARIANCE (INCLUDE JUSTIFICATION) The proposed change is as follows: Soils removed from an excavation on the southwest corner of the O'Henry Laundry will be treated on site using ex situ, and possibly, in situ soil venting to volatilize PCE from the soils. Ex situ soil venting will be performed by constructing a soil pile interlayered with plastic sheeting and coarse gravel in which PVC vent pipes are placed horizontally. The pile will be constructed on an existing 15' x 25' concrete pad on the O'Henry Laundry ^{property}. Vent pipes will be manifolded to roof turbines (passive venting). Two to four weeks after construction, the soil venting system will be monitored and, if required by EPA or DPNR, retrofitted with an active blower system and/or any necessary air filtering apparatus. The soil pile will be sealed against rainfall using plastic sheeting. During the 2-4 week period between construction and the 1st monitoring work, a fence ~~and~~ (or wall) and shed roof will be constructed over the pile. If in situ venting is required, slotted PVC pipe will be placed vertically in the excavation, adjacent to the concrete slab.

APPLICABLE DOCUMENT: Initial venting will be passive. If required, an active venting system and filter will be installed during the 1st monitoring work.

"Work Plan for Evaluation and Interim Remediation of Soils, O'Henry Laundry, Tutu, St. Thomas, U.S.V.I."

CC: Belinda Price
Central Files

REQUESTED BY: Kenneth L. Loy DATE: 3/9/95

APPROVED BY: CKing DATE: 3/9/95

EPA Project Manager

Belinda Price DATE: 3/9/95

Quality Assurance Officer
IT Project Manager

Signed 3/21/95
DATE: _____

409819-7

VALIDATED ANALYTICAL RESULTS

Memorandum

To: Belinda Price - IT, Knoxville

Date: April 10, 1995

From: Teri Jackson - Quanterra, Knoxville

Subject: L'Henri Data Validation Summary
Quanterra Project Number: 4481242

Level IV validation has been completed by Quanterra-FAS. Data validation was performed using the USEPA Contract Laboratory Program (CLP) "National Functional Guidelines for Organic Data Review (1994)".

Specifically, the following data were reviewed:

PARAMETER	MATRIX	# SAMPLES
VOA by GC/MS	Soil	22
EPA CLP OLM01.8	Water	1
	Blanks	4

VOA = Volatile Organic Analysis
GC/MS = Gas Chromatography/Mass Spectrometry
EPA = Environmental Protection Agency
CLP = Contract Laboratory Program

The following paragraphs highlight the key findings of this validation effort:

I. Volatile Organic Analyses (VOA) by GC/MS

Data qualifier were applied to the data for the following factors:

1. **High Percent Relative Standard Deviation (%RSD)** - The %RSD for chloroethane exceeded 30% in one initial calibration. Associated chlorethene results were qualified as estimated (J, UJ).

2. **High Response Factor (RF)** - Some continuing calibration checks indicate that chloroemethane, 2-butanone, acetone and vinyl chloride exceeded the percent difference (%D) criteria (>25%). Associated results were qualified as estimated (J, UJ).
3. **Blank Contamination** - Several compounds were detected in the method blanks, trip blanks, field blanks and equipment rinsates. The "5x/10x Rule" was applied and associated sample results less than five/ten times the blank concentration were qualified as non-detect (U).
4. **Dilutions** - Several samples reported tetrachloroethene results exceeding the calibration range in the original sample. Dilutions were run and the tetrachloroethene result should be reported from the diluted analysis.
5. **Matrix Spike/Matrix Spike Duplicate (MS/MSD)** - No MS/MSD was reported with this package. There was no request for the lab to run a MS/MSD on this project. Batch quality control (QC) analysis can be pulled if needed.
6. **Tentatively Identified Compounds (TICs)** - TICs have been qualified as "NJ" for presumptive evidence of a material present at an estimated concentration.

Full details of the validation may be found in the report entitled, "Data Validation: Volatiles by GC/MS", located in Attachment A.

The raw data packages will be returned to you for your use and maintenance in the project file. We will maintain in our files, copies of this summary and the individual validation reports.

Please let me know if you have any questions.

Attachments

cc: John Ragsdale, w/o attachment
FAS Project Files

Attachment "A"

Quanterra Incorporated
5815 Middlebrook Pike
Knoxville, Tennessee 37921

615 588-6401 Telephone
615 584-4315 Fax

March 9, 1995

BELINDA PRICE
IT ENGINEERING SERVICES - KNOXVILLE
312 DIRECTORS DRIVE
KNOXVILLE, TN 37923

Re: L'HENRY
E.O. #

Dear BELINDA PRICE:

This confirms the receipt of samples for analysis on March 9, 1995 at our QUANTERRA-KNOXVILLE laboratory. These samples were received in good condition unless otherwise noted on an attached Condition Upon Receipt variance form. The samples were logged into our tracking system at Work Order #3034. Please review the attached outline for samples received and test assignments for any discrepancies. If you discover any problems please call me at (615) 588-6401.

We appreciate the opportunity to support your analytical requirements. Your report will be sent to you at the above address on or before March 30, 1995 unless advised otherwise.

Again, if you have any questions or comments on our performance, please feel free to call me at (615) 588-6401.

Sincerely,

Rebecca Charles

REBECCA CHARLES
Project Manager
QUANTERRA-KNOXVILLE

March 9, 1995

Client: IT ENGINEERING SERVICES - KNOXVILLE

Project: L'HENRY

Client ID: L'HENRY

LIMS Work Order #: 3034

Client Sample ID	Lab ID	QC	Test Description
ITSB01-05.0	AE5074		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01)
ITSB01-10.0	AE5075		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01)
ITSB01-14.5	AE5076		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01)
EXS01	AE5077		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01)
EXS02	AE5078		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01)
EXS03	AE5079		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01)
EXS04	AE5080		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01)
EXS05	AE5081		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01)
TB030695	AE5082		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) REPORT DELIVERABLE-COA (CERTIFICATE)

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

Reference Document No. 1750
Page 1 of 2

Project Name/No. ¹ L'HENRI REMED. ^{SOIL} Samples Shipment Date ⁷ 3/7/95
Sample Team Members ² K. Loy, G. Ward, M. Boshears Lab Destination ⁸ Quanterra - Middlebrook
Profit Center No. ³ 3521210 Lab Contact ⁹ Becky Charles
Project Manager ⁴ Belinda Price Project Contact/Phone ¹² BP 615/6903211
Purchase Order No. ⁶ Carrier/Waybill No. ¹³ 40026780880
Required Report Date ¹¹ 3/21/95 Report to: ¹⁰ Belinda Price
312 Directors Drive
Knoxville, TN 37923

ONE CONTAINER PER LINE

Sample Number ¹⁴	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Pre-servative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
ITSBΦ1-05.0	SOIL	3/6/95 14:20	1 glass	40Z	ICE	CLP VOL 3/90		
ITSBΦ1-10.0	SOIL	3/6/95 15:10	1 glass	40Z	ICE	CLP VOL 3/90		
ITSBΦ1-14.5	SOIL	3/6/95 15:35	1 glass	40Z	ICE	CLP VOL 3/90		
EXSΦ1	SOIL	3/7/95 12:35	1 glass	40Z	ICE	CLP VOL 3/90		
EXSΦ2	SOIL	3/7/95 13:00	1 glass	40Z	ICE	CLP VOL 3/90		
EXSΦ3	SOIL	3/7/95 13:20	1 glass	40Z	ICE	CLP VOL 3/90		
EXSΦ4	SOIL	3/7/95 13:45	1 glass	40Z	ICE	CLP VOL 3/90		
EXSΦ5	SOIL	3/7/95 14:05	1 glass	40Z	ICE	CLP VOL 3/90		

Special Instructions: ²³

Possible Hazard Identification: ²⁴

Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal: ²⁵

Return to Client ☐ Disposal by Lab ☒ Archiv (mos.)

Turnaround Time Required: ²⁶

Normal ☒ Rush ☐

QC Level: ²⁷

I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by ²⁸
(Signature/Affiliation)

Date:
Time:

1. Received by ²⁸
(Signature/Affiliation)

Date:
Time:

2. Relinquished by
(Signature/Affiliation)

Date:
Time:

2. Received by
(Signature/Affiliation)

Date:
Time:

3. Relinquished by
(Signature/Affiliation)

Date:
Time:

3. Received by
(Signature/Affiliation)

Date:
Time:

Comments: ²⁹

Send copies of COL to Belinda Price.

TUT 007 1707

Write: To accompany samples

Yellow: Field copy

* See back of form for special instructions.



ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.³⁰ 1750
Page 2 of 2

Project Name Litani Soil Remediation Project No. 409830.002

Samples Shipment Date 3/7/95

ONE CONTAINER PER LINE

[illegible]

White: To accompany samples

Yellow: Field copy

*** See back of form for special instructions**

Quanterra Incorporated
5815 Middlebrook Pike
Knoxville, Tennessee 37921

615 588-6401 Telephone
615 584-4315 Fax

March 13, 1995

BELINDA PRICE
IT ENGINEERING SERVICES - KNOXVILLE
312 DIRECTORS DRIVE
KNOXVILLE, TN 37923

Re: L'HENRY
P.O. #

Dear BELINDA PRICE:

This confirms the receipt of samples for analysis on March 13, 1995 at our QUANTERRA-KNOXVILLE laboratory. These samples were received in good condition unless otherwise noted on an attached Condition Upon Receipt variance form. The samples were logged into our tracking system as Work Order #3067. Please review the attached outline for samples received and test assignments for any discrepancies. If you discover any problems please call me at (615) 588-6401.

We appreciate the opportunity to support your analytical requirements. Your report will be sent to you at the above address on or before March 25, 1995 unless advised otherwise.

Again, if you have any questions or comments on our performance, please feel free to call me at (615) 588-6401.

Sincerely,

Rebecca Charles

REBECCA CHARLES
Project Manager
QUANTERRA-KNOXVILLE

TUT 007 1709

March 13, 1995

Client: IT ENGINEERING SERVICES - KNOXVILLE

Project: L'HENRY

Client ID: L'HENRY

LIMS Work Order #: 3067

Client Sample ID	Lab ID	QC	Test Description
=====	=====	===	=====
EXS23	AE5446		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
EXS24	AE5447		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
EXS25	AE5448		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
EXS26	AE5449		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
EXS27	AE5450		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
EXS28	AE5451		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
EXS29	AE5452		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
EXS30	AE5453		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
EXS31	AE5454		DISPOSAL - CHEMICAL (NON PCB/DIOXIN)

March 13, 1995

Client: IT ENGINEERING SERVICES - KNOXVILLE

Project: L'HENRY

Client ID: L'HENRY

LIMS Work Order #: 3067

Client Sample ID	Lab ID	QC	Test Description
EXS31	AE5454		CLP 90/91 SOW VOLATILES (VOA) (OLM01) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
EXS32	AE5455		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
EXS33	AE5456		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
EXS34	AE5457		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
EXS35	AE5458		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
EXS27DU	AE5459		DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILES (VOA) (OLM01) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
TB-MAR9-95	AE5460		CLP 90/91 SOW VOLATILES (VOA) (OLM01) DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
EQUIPMENT RINSE	AE5461		CLP 90/91 SOW VOLATILES (VOA) (OLM01) DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
FB-MAR9-95	AE5462		CLP 90/91 SOW VOLATILES (VOA) (OLM01) DISPOSAL - CHEMICAL (NON PCB/DIOXIN)

March 13, 1995

Client: IT ENGINEERING SERVICES - KNOXVILLE

Project: L'HENRY

Client ID: L'HENRY

LIMS Work Order #: 3067

Client Sample ID	Lab ID	QC	Test Description
FB-MAR9-95	AE5462		CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS
DCW-MAR10-95	AE5463		CLP 90/91 SOW VOLATILES (VOA) (OLM01) DISPOSAL - CHEMICAL (NON PCB/DIOXIN) CLP 90/91 SOW VOLATILE (VOA) TIC'S (OLM01) CLP-LIKE DATA PKG, GCMS TESTS



INTERNATIONAL
TECHNOLOGY
CORPORATION



ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD

wa. 1061
#3132

Reference Document No. 4165
Page 1 of 2

Project Name/No. ¹ Henri Soil Remed.
Sample Team Members ² Ken Loy, Greg Ward
Profit Center No. ³ 3521210
Project Manager ⁴ Belinda Price
Purchase Order No. ⁶

Samples Shipment Date ⁷ 3/10/95
Lab Destination ⁸ Quanterra - Middlebrook
Lab Contact ⁹ Becky Charles
Project Contact/Phone ¹² BP/615/690-3211
Carrier/Waybill No. ¹³

Bill to ⁵ IT Corporation
312 Directors Drive
Knoxville, TN 37923
Attn. Belinda Price

¹⁰ IT Corporation
312 Directors Drive
Knoxville, TN 37923
Attn. Belinda Price

Required Report Date ¹¹ 3/25/95

ONE CONTAINER PER LINE

Sample Number ¹	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Pre-servative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
✓ EXS23	Soil-grab	3/9/95 11:55	glass	40Z	cool	CLP VOC	received @ OC, 1/14/95, used	
✓ EXS24	Soil-grab	3/9/95 12:10	glass	40Z	cool	CLP VOC	intact - MTD 3/10/95	
✓ EXS25	Soil-grab	3/9/95 12:55	glass	40Z	cool	CLP VOC		
✓ EXS26	Soil-grab	3/9/95 13:25	glass	40Z	cool	CLP VOC		
✓ EXS27	Soil-grab	3/9/95 13:55	glass	40Z	cool	CLP VOC		
✓ EXS28	Soil-grab	3/9/95 14:10	glass	40Z	cool	CLP VOC		
✓ EXS29	Soil-grab	3/9/95 14:50	glass	40Z	cool	CLP VOC		
✓ EXS30	Soil-grab	3/9/95 15:40	glass	40Z	cool	CLP VOC		

Special Instructions: ²³

Possible Hazard Identification: ²⁴

Non-hazard ☒ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: ²⁵

Return to Client ☐ Disposal by Lab ☒ Archive ☐ (mo)

Turnaround Time Required: ²⁶

Normal ☒ Rush ☐

QC Level: ²⁷

I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by ²⁸ [Signature] Date: 3/10/95
(Signature/Affiliation) Time: 15:35

1. Received by ²⁸ [Signature] Date: 3/13/95
(Signature/Affiliation) Time: 0925

2. Relinquished by (Signature/Affiliation) Date: Time:

2. Received by (Signature/Affiliation) Date: Time:

3. Relinquished by (Signature/Affiliation) Date: Time:

3. Received by (Signature/Affiliation) Date: Time:

Comments: ²⁹ Please Return Copy of COC to Belinda Price.

TUT 007 1713



Reference Document No. 30 41658
Page 2 of 2

Samples Shipment Date 3/10/95

[illegible]

TUT 007 1714

DATA VALIDATION: VOLATILES BY GC/MS (CLP)

Project Name: L'HENRI Number: 404830.002 QC Level: _____Lab ID: M'BEDIK Report No: 3034 Number and Type of Samples: 8SDIL, 1H₂O

Special Instructions: _____

1) Holding Times

Field Sample No.	Matrix	Date Collected	Preservation	Analysis Date	Comments
EXS01	SOIL	3/7/95	4°C	3/14/95	
EXS01DL				3/14/95	
EXS02				3/14/95	
EXS03				3/14/95	
EXS04				3/14/95	
EXS04DL				3/14/95	
EXS05				3/14/95	
ITSB01050		3/6/95		3/14/95	
ITSB01100				3/14/95	
ITSB01145				3/14/95	
TB030695	H ₂ O	3/6/95		3/15/95	

Notes: _____

Recommended Action:

All samples received and analyzed within specified holding times. no recommended action.

Reviewed By/Date: ALP 3/29/95QA Concurrence/Date: Yves Rader 4-3-95

591 Revision 3

TUT 007 1715

Instrument Performance: Bromofluorobenzene (BFB) Standard

Check if "OK"

BFB Run Date	GC/MS ID	Form VA Present?	Data Transcribed?	Significant Figures?	Ratio Calculations?	Background Subtractions?	Meets Specifications?	Comment
12/15/94	ISDA	✓	✓	✓	✓	✓	✓	
12/15/94	ISDA	✓	✓	✓	✓	✓	✓	
3/10/95	QSDA	✓	✓	✓	✓	✓	✓	
3/14/95	QSDA	✓	✓	✓	✓	✓	✓	
3/30/95								

Recommended Action:

no recommended action

III) Calibration

A) Initial Calibration

Form VI A present? yes

1. Calculation Check - Mean RRF (minimum 1 compound per calibration)

Calibration Date	GC/MS ID	Ref.	Matrix	Filename	Selected Compound	Mean RRF	Agree with Lab Report ?
12/15/94	ISDA	1	SOIL	12/15/94, 52, 53, 54, 55	Chloromethane	0.949	yes
3/10/95	QSDA	1	SOIL	QI03101, 02, 03, 04, 05	Styrene	0.644	yes
							3/30/95

2. Any Mean RRF < 0.05 ? no (If "yes" then list:)

Compound	Mean RRF	GC/MS ID	Calibration Date	Comments
3/30/95				

Reviewed By/Date:

3/30/95

QA Concurrence/Date:

Tara K. Baker 4-3-95

01.841 Revision 1

TUT 007 1716

III) Calibration (Continued)**A) Initial Calibration (Continued)****3. Calculation Check - % RSD**

(Minimum 1 compound per calibration, may use same as for mean RRF)

Calibration Date	GC/MS ID	Compound	Percent RSD	Agree with Lab Report ?
12/15/94	IS00A	Methylene Chloride	5.9	yes
3/10/95	QSD0A	Chloromethane	10.5	yes
				no
				3/30/95

4. Any % RSD > 30% ? no (If "yes" then list:)

Compound	GC/MS ID	Calibration Date	Percent RSD	Comments
			no	
			3/30/95	

Recommended Action:no recommended action**B) Continuing Calibration**Form VIIA present? yes**1. Any RRF < 0.05 ?** no (If "yes" then list:)

Standard Filename	Calibration Date	GC/MS ID	Compound	RRF

Reviewed By/Date:

RLH 3/30/95

QA Concurrence/Date:

Theresa R. R. 4-3-95

Revision 2.3

III) Calibration (Continued)**Continuing Calibration (Continued)****2. Calculation Check - % D (Minimum 1 compound per standard)**

Standard Filename	Ref.	Calibration Date	GC/MS ID	Compound	% D	Agree with Lab Report ?
WS0315	1	3/15/95	I500A	Bromomethane	16.6	yes
Q50314	1	3/14/95	Q500A	Ethyl Benzene	0.7	yes
					M	
					3/30/95	

3. Any % D > 25% ? yes (If "yes" then list:)

Standard Filename	Calibration Date	Compound	% D
WS0315	3/15/95	Chloromethane	27.7
		2-Butanone	25.9
Q50314	3/14/95	Chloromethane	45.8
		Vinyl Chloride	40.0
			M
			3/30/95

water

soil

Recommended Action:

So D > 25%

positive - J

non detect - 45

Reviewed By/Date:

3/30/95

QA Concurrence/Date:

4-5-95

01/18/91 Revision

IV) Blanks1. Form IV A present? yes2. Method blank reported for each matrix, concentration level, GC/MS system as appropriate? yes
If no, explain: _____3. Any common lab contaminants detected? yes (If "yes" then list:)

Blank ID	GC/MS ID	Date Run	Concentration (specify units)			
			Methylene Chloride	Acetone	Toluene	2-butanone
VBCKAEG146	QSD0A	3/14/95	2 ug/kg	8 ug/kg		
VBCKAEG287	ISD0A	3/15/95	1	4		

4. Other TCLs or TICs detected? yes (If "yes" then list:)

Blank ID	GC/MS ID	Date Run	Compound	Concentration (specify units)
VBCKAEG146	QSD0A	3/14/95	Chloroform	1 ug/kg
VBCKAEG287	ISD0A	3/15/95	2-butanone	2 ug/L
↓	↓	↓	Extrane (total)	2 ug/L
↓	↓	↓	unknown 1.53 RT	2
↓	↓	↓	unknown 1.97 RT	2

5. Any contaminants detected in FB, TB, or ER samples? yes

Blank ID	Date Collected	Concentration (specify units)			
		Methylene Chloride	Acetone	Toluene	Other (specify)
TB032095	3/6/95	2 ug/L	7 ug/L		
		RT	RT		At 3/30/95

Note: DO NOT list compounds adjusted to "ND" based on associated lab blank contamination in Section IV. 5.

Recommended Action:

Apply the 10X, 5X, or < CRDL rules to any sample with associated blank contamination.

V) Surrogate Recovery1. Form II A present? yesAll samples listed? yesEntries agree with raw data? yes (If "no" for any answer explain below:)Reviewed By/Date: RLH 3/30/95QA Concurrence/Date: Teresa Rahn 4-3-95

01/18/91 Revision 55

V) Surrogate Recovery (Continued)2. Any runs with one (1) or more recoveries outside limits? no (If "yes" then list:)

Sample ID	Surrogate Compound	Original % Recovery	Re-Run % Recovery	Comments
			<u>no</u>	
			<u>3/30/95</u>	

All method blank surrogates within limits? yes (If "no" explain below:)**Recommended Action:**no recommended action**VI) Matrix Spike / Matrix Spike Duplicates**

1. Number of pairs analyzed:

Matrix:

Frequency:

N/A
soilwaterno 3/30/952. Form III A present? noResults entries agree with raw data? N/A

% R, RPD Calculations OK?

N/A

3. All % R, RPD within limits?

N/A

(If "no" then list:)

Sample ID	Spike Compound	% R MS/MSD	RPD	Comments
		<u>no</u>		
		<u>3/30/95</u>		

Recommended Action: No ms/msd reported in association with these samplesno recommended action

Reviewed By/Date:

[Signature] 3/30/95

QA Concurrence/Date:

[Signature] 4-3-96

1. 57. Revision 3.0

VII) Field Duplicates1. Are original/field duplicate pairs identifiable? no (If "yes" then list:)

Matrix	Original Sample No.	Duplicate Sample No.
		<u>MC</u>
		<u>3/30/95</u>

Matrix	Original Sample No.	Duplicate Sample No.
		<u>3/30/95</u>

2. Overall frequency: N/A

3. Comments (Evaluate RPDs for positive paired analytes):

MC
3/30/95**VIII) Internal Standards Performance**1. Form VIIIA present? : yesAreas/RT agree with raw data? yes2. All sample/blank IS areas within limits? yesList exceptions: N/A3. All sample/blank IS RTs within 30 seconds of standard IS RT? yesList exceptions: N/A**Recommended Action:**no recommended action

Reviewed By/Date:

Allegre 3/30/95

QA Concurrence/Date:

Leresa M. Mohr 4-3-95

01/18/91 Revision 3.7

(X) Compound Identification and Quantitation

[illegible]

Recommended Action:

See *vertebrae analysis* *organisms* *later* *charts* *for* *compositional*
qualification

Reviewed By/Date:

3/30/95

QA Concurrence/Date:

Teresa John 4-395

(X) Tentatively Identified Compounds

1. Have all peaks that should be searched, been searched and reported (Form I E)?

yes

2. Any TICs found in samples also in associated blanks?

no

3/30/95

yes

3. Are reasonable identifications reported?

yes

4. Any TCL compounds reported as TICs?

noRecommended Action:no recommended actionXI) System Performance

Check for and explain any of the following:

1. Abrupt RIC baseline shift:

2. High background or RT shifts:

3. Baseline rise at high temperature:

4. Extraneous peaks:

5. Loss of peak resolution:

6. Peak tailing or splitting:

no

9/30/95

Recommended Action:no recommended action

Reviewed By/Date:

OK 5/30/95

QA Concurrence/Date:

Tom 4-395

01/18/91 Revision 1-9

XII) Overall Assessment

1. No holding time violations
 2. Initial calibration - no recommended action
 3. Continuing calibration - ~~no~~ ^{me} 90 D > 25% positive - J
3/30/95 non detect - US.
 4. Blank contamination existed in several samples - apply the 10X, 5X, or < CRCL rules to any sample with associated blank contamination.
 5. Refer to the volatiles organics analysis data sheets for sample compound qualifiers.
- Soil results for chloromethane and vinyl chloride qualified and water results for chloromethane and 2-butanone qualified.
6. No ms/msd was reported with this package. There was no request to the lab for assigned to be run on ~~day~~ of these samples. The batch QC can be pulled if needed.

K
3/30/95

1735
3/30/95

Reviewed By/Date:

5/30/95

QA Concurrence/Date:

4-3-95

01/18/91 Revision 2-10

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS01

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3034 SAS No.: _____ SDG No.: EXS01

Matrix: (soil/water) SOIL Lab Sample ID: AE5077

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5077

Level: (low/med) LOW Date Received: 03/09/95

% Moisture: not dec. 19 Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

74-87-3-----	Chloromethane	12	U	12 uJ
74-83-9-----	Bromomethane	12	U	12 u
75-01-4-----	Vinyl Chloride	12	U	12 uJ
75-00-3-----	Chloroethane	12	U	12 u
75-09-2-----	Methylene Chloride	2	BJ	
67-64-1-----	Acetone	11	BJ	
75-15-0-----	Carbon Disulfide	12	U	
75-35-4-----	1,1-Dichloroethene	12	U	
75-34-3-----	1,1-Dichloroethane	12	U	
540-59-0-----	1,2-Dichloroethene (total)	12	U	
67-66-3-----	Chloroform	2	BJ	
107-06-2-----	1,2-Dichloroethane	12	U	
78-93-3-----	2-Butanone	12	U	
71-55-6-----	1,1,1-Trichloroethane	12	U	
56-23-5-----	Carbon Tetrachloride	12	U	
75-27-4-----	Bromodichloromethane	12	U	
78-87-5-----	1,2-Dichloropropane	12	U	
10061-01-5-----	cis-1,3-Dichloropropene	12	U	
79-01-6-----	Trichloroethene	2	J	25
124-48-1-----	Dibromochloromethane	12	U	12 u
79-00-5-----	1,1,2-Trichloroethane	12	U	
71-43-2-----	Benzene	12	U	
10061-02-6-----	trans-1,3-Dichloropropene	12	U	
75-25-2-----	Bromoform	12	U	
108-10-1-----	4-Methyl-2-Pentanone	12	U	
591-78-6-----	2-Hexanone	12	U	
127-18-4-----	Tetrachloroethene	280	E	Report
79-34-5-----	1,1,2,2-Tetrachloroethane	12	U	12 u
108-88-3-----	Toluene	12	U	
108-90-7-----	Chlorobenzene	12	U	
100-41-4-----	Ethylbenzene	12	U	
100-42-5-----	Styrene	12	U	
1330-20-7-----	Xylene (total)	12	U	

FORM I VOA

TUT 007 1725

4-3-95 3/90

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS01

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3034

SAS No.: _____

SDG No.: EXS01

Matrix: (soil/water) SOIL

Lab Sample ID: AE5077

Sample wt/vol: 5.0 (g/mL) G

Lab File ID: AE5077

Level: (low/med) LOW

Date Received: 03/09/95

% Moisture: not dec. 19

Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS01DL

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3034

SAS No.: _____

SDG No.: EXS01

Matrix: (soil/water) SOIL

Lab Sample ID: AE5077

Sample wt/vol: 3.0 (g/mL) G

Lab File ID: AE5077D

Level: (low/med) LOW

Date Received: 03/09/95

% Moisture: not dec. 19

Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.67

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Q

74-87-3-----	Chloromethane	21	U	Report OR ↓ 140 D Report from OR ↓
74-83-9-----	Bromomethane	21	U	
75-01-4-----	Vinyl Chloride	21	U	
75-00-3-----	Chloroethane	21	U	
75-09-2-----	Methylene Chloride	2	BDJ	
67-64-1-----	Acetone	9	BDJ	
75-15-0-----	Carbon Disulfide	21	U	
75-35-4-----	1,1-Dichloroethene	21	U	
75-34-3-----	1,1-Dichloroethane	21	U	
540-59-0-----	1,2-Dichloroethene (total)	21	U	
67-66-3-----	Chloroform	21	U	
107-06-2-----	1,2-Dichloroethane	21	U	
78-93-3-----	2-Butanone	21	U	
71-55-6-----	1,1,1-Trichloroethane	21	U	
56-23-5-----	Carbon Tetrachloride	21	U	
75-27-4-----	Bromodichloromethane	21	U	
78-87-5-----	1,2-Dichloropropane	21	U	
10061-01-5-----	cis-1,3-Dichloropropene	21	U	
79-01-6-----	Trichloroethene	21	U	
124-48-1-----	Dibromochloromethane	21	U	
79-00-5-----	1,1,2-Trichloroethane	21	U	
71-43-2-----	Benzene	21	U	
10061-02-6-----	trans-1,3-Dichloropropene	21	U	
75-25-2-----	Bromoform	21	U	
108-10-1-----	4-Methyl-2-Pentanone	21	U	
591-78-6-----	2-Hexanone	21	U	
127-18-4-----	Tetrachloroethene	140	D	
79-34-5-----	1,1,2,2-Tetrachloroethane	21	U	
108-88-3-----	Toluene	21	U	
108-90-7-----	Chlorobenzene	21	U	
100-41-4-----	Ethylbenzene	21	U	
100-42-5-----	Styrene	21	U	
1330-20-7-----	Xylene (total)	21	U	

FORM I VOA

TUT 007 1727

3/90

TS
4-3-95

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS01DL

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3034

SAS No.: _____

SDG No.: EXS01

Matrix: (soil/water) SOIL

Lab Sample ID: AE5077

Sample wt/vol: 3.0 (g/mL) G

Lab File ID: AE5077D

Level: (low/med) LOW

Date Received: 03/09/95

% Moisture: not dec. 19

Date Analyzed: 03/14/95 *ms 5/22/95*

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0 *1.67*

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS02

Lab Name: ITAS-KNOXVILLE Contract: LHENRI
Lab Code: ITSTU Case No.: 3034 SAS No.: _____ SDG No.: EXS01
Matrix: (soil/water) SOIL Lab Sample ID: AE5078
Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5078
Level: (low/med) LOW Date Received: 03/09/95
% Moisture: not dec. 19 Date Analyzed: 03/14/95
GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0
Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>		Q	✓
74-87-3	Chloromethane	12	U		12uJ
74-83-9	Bromomethane	12	U		12u
75-01-4	Vinyl Chloride	12	U		12uJ
75-00-3	Chloroethane	12	U		12u
75-09-2	Methylene Chloride	2	BJ		
67-64-1	Acetone	11	BJ		
75-15-0	Carbon Disulfide	12	U		
75-35-4	1,1-Dichloroethene	12	U		
75-34-3	1,1-Dichloroethane	12	U		
540-59-0	1,2-Dichloroethene (total)	12	U		
67-66-3	Chloroform	12	U		
107-06-2	1,2-Dichloroethane	12	U		
78-93-3	2-Butanone	12	U		
71-55-6	1,1,1-Trichloroethane	12	U		
56-23-5	Carbon Tetrachloride	12	U		
75-27-4	Bromodichloromethane	12	U		
78-87-5	1,2-Dichloropropane	12	U		
10061-01-5	cis-1,3-Dichloropropene	12	U		
79-01-6	Trichloroethene	12	U		
124-48-1	Dibromochloromethane	12	U		
79-00-5	1,1,2-Trichloroethane	12	U		
71-43-2	Benzene	18			18
10061-02-6	trans-1,3-Dichloropropene	12	U		12u
75-25-2	Bromoform	12	U		
108-10-1	4-Methyl-2-Pentanone	12	U		
591-78-6	2-Hexanone	12	U		
127-18-4	Tetrachloroethene	120			120
79-34-5	1,1,2,2-Tetrachloroethane	12	U		12u
108-88-3	Toluene	12	J		12J
108-90-7	Chlorobenzene	12	U		12u
100-41-4	Ethylbenzene	12	J		
100-42-5	Styrene	12	U		
1330-20-7	Xylene (total)	3	J		3J

FORM I VOA

Pms 3/22/95

3/90

TUT 007 1729

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS02

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3034 SAS No.: _____ SDG No.: EXS01

Matrix: (soil/water) SOIL Lab Sample ID: AE5078

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5078

Level: (low/med) LOW Date Received: 03/09/95

% Moisture: not dec. 19 Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS03

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3034 SAS No.: _____ SDG No.: EXS01

Matrix: (soil/water) SOIL Lab Sample ID: AE5079

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5079

Level: (low/med) LOW Date Received: 03/09/95

% Moisture: not dec. 16 Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

74-87-3-----	Chloromethane	12	U	12u
74-83-9-----	Bromomethane	12	U	12u
75-01-4-----	Vinyl Chloride	12	U	12u
75-00-3-----	Chloroethane	12	U	12u
75-09-2-----	Methylene Chloride	1	BJ	
67-64-1-----	Acetone	12	U	
75-15-0-----	Carbon Disulfide	12	U	
75-35-4-----	1,1-Dichloroethene	12	U	
75-34-3-----	1,1-Dichloroethane	12	U	
540-59-0-----	1,2-Dichloroethene (total)	12	U	
67-66-3-----	Chloroform	12	U	
107-06-2-----	1,2-Dichloroethane	12	U	
78-93-3-----	2-Butanone	12	U	
71-55-6-----	1,1,1-Trichloroethane	12	U	
56-23-5-----	Carbon Tetrachloride	12	U	
75-27-4-----	Bromodichloromethane	12	U	
78-87-5-----	1,2-Dichloropropane	12	U	
10061-01-5-----	cis-1,3-Dichloropropene	12	U	
79-01-6-----	Trichloroethene	12	U	
124-48-1-----	Dibromochloromethane	12	U	
79-00-5-----	1,1,2-Trichloroethane	12	U	
71-43-2-----	Benzene	12	U	
10061-02-6-----	trans-1,3-Dichloropropene	12	U	
75-25-2-----	Bromoform	12	U	
108-10-1-----	4-Methyl-2-Pentanone	12	U	
591-78-6-----	2-Hexanone	12	U	
127-18-4-----	Tetrachloroethene	54		54
79-34-5-----	1,1,2,2-Tetrachloroethane	12	U	12u
108-88-3-----	Toluene	12	U	
108-90-7-----	Chlorobenzene	12	U	
100-41-4-----	Ethylbenzene	12	U	
100-42-5-----	Styrene	12	U	
1330-20-7-----	Xylene (total)	12	U	

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS03

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3034 SAS No.: _____ SDG No.: EXS01

Matrix: (soil/water) SOIL Lab Sample ID: AE5079

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5079

Level: (low/med) LOW Date Received: 03/09/95

% Moisture: not dec. 16 Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS04

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3034

SAS No.: _____

SDG No.: EXS01

Matrix: (soil/water) SOIL

Lab Sample ID: AE5080

Sample wt/vol: 5.0 (g/mL) G

Lab File ID: AE5080

Level: (low/med) LOW

Date Received: 03/09/95

% Moisture: not dec. 16

Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Q

74-87-3-----	Chloromethane	1	J	15
74-83-9-----	Bromomethane	12	U	12u
75-01-4-----	Vinyl Chloride	12	U	12u
75-00-3-----	Chloroethane	12	U	12u
75-09-2-----	Methylene Chloride	2	BJ	
67-64-1-----	Acetone	6	BJ	
75-15-0-----	Carbon Disulfide	12	U	
75-35-4-----	1,1-Dichloroethene	12	U	
75-34-3-----	1,1-Dichloroethane	12	U	
540-59-0-----	1,2-Dichloroethene (total)	12	U	
67-66-3-----	Chloroform	12	U	
107-06-2-----	1,2-Dichloroethane	12	U	
78-93-3-----	2-Butanone	12	U	
71-55-6-----	1,1,1-Trichloroethane	12	U	
56-23-5-----	Carbon Tetrachloride	12	U	
75-27-4-----	Bromodichloromethane	12	U	
78-87-5-----	1,2-Dichloropropane	12	U	
10061-01-5-----	cis-1,3-Dichloropropene	12	U	
79-01-6-----	Trichloroethene	12	U	
124-48-1-----	Dibromochloromethane	12	U	
79-00-5-----	1,1,2-Trichloroethane	12	U	
71-43-2-----	Benzene	12	U	
10061-02-6-----	trans-1,3-Dichloropropene	12	U	
75-25-2-----	Bromoform	12	U	
108-10-1-----	4-Methyl-2-Pentanone	12	U	
591-78-6-----	2-Hexanone	12	U	
127-18-4-----	Tetrachloroethene	270	E	Report
79-34-5-----	1,1,2,2-Tetrachloroethane	12	U	12u
108-88-3-----	Toluene	1	J	15
108-90-7-----	Chlorobenzene	12	U	12u
100-41-4-----	Ethylbenzene	12	U	
100-42-5-----	Styrene	12	U	
1330-20-7-----	Xylene (total)	12	U	

FORM I VOA

TUT 007 1733

3/90

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS04

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3034 SAS No.: _____ SDG No.: EXS01

Matrix: (soil/water) SOIL Lab Sample ID: AE5080

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5080

Level: (low/med) LOW Date Received: 03/09/95

% Moisture: not dec. 16 Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS04DL

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3034 SAS No.: _____ SDG No.: EXS01

Matrix: (soil/water) SOIL Lab Sample ID: AE5080

Sample wt/vol: 3.0 (g/mL) G Lab File ID: AE5080D

Level: (low/med) LOW Date Received: 03/09/95

% Moisture: not dec. 16 Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q	
74-87-3	-----Chloromethane	20	U	Report
74-83-9	-----Bromomethane	20	U	
75-01-4	-----Vinyl Chloride	20	U	
75-00-3	-----Chloroethane	20	U	
75-09-2	-----Methylene Chloride	20	U	
67-64-1	-----Acetone	9	BDJ	
75-15-0	-----Carbon Disulfide	20	U	
75-35-4	-----1,1-Dichloroethene	20	U	
75-34-3	-----1,1-Dichloroethane	20	U	
540-59-0	-----1,2-Dichloroethene (total)	20	U	
67-66-3	-----Chloroform	3	BDJ	
107-06-2	-----1,2-Dichloroethane	20	U	
78-93-3	-----2-Butanone	20	U	
71-55-6	-----1,1,1-Trichloroethane	20	U	
56-23-5	-----Carbon Tetrachloride	20	U	
75-27-4	-----Bromodichloromethane	20	U	
78-87-5	-----1,2-Dichloropropane	20	U	
10061-01-5	-----cis-1,3-Dichloropropene	20	U	
79-01-6	-----Trichloroethene	20	U	
124-48-1	-----Dibromochloromethane	20	U	
79-00-5	-----1,1,2-Trichloroethane	20	U	Report
71-43-2	-----Benzene	20	U	
10061-02-6	-----trans-1,3-Dichloropropene	20	U	
75-25-2	-----Bromoform	20	U	
108-10-1	-----4-Methyl-2-Pentanone	20	U	
591-78-6	-----2-Hexanone	20	U	
127-18-4	-----Tetrachloroethene	100	D	
79-34-5	-----1,1,2,2-Tetrachloroethane	20	U	
108-88-3	-----Toluene	20	U	
108-90-7	-----Chlorobenzene	20	U	
100-41-4	-----Ethylbenzene	20	U	
100-42-5	-----Styrene	20	U	
1330-20-7	-----Xylene (total)	20	U	

FORM I VOA

3/90

TUT 007 1735 3

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS04DL

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3034 SAS No.: _____ SDG No.: EXS01

Matrix: (soil/water) SOIL Lab Sample ID: AE5080

Sample wt/vol: 3.0 (g/mL) G Lab File ID: AE5080D

Level: (low/med) LOW Date Received: 03/09/95

% Moisture: not dec. 16 Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS05

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3034

SAS No.: _____

SDG No.: EXS01

Matrix: (soil/water) SOIL

Lab Sample ID: AE5081

Sample wt/vol: 5.0 (g/mL) G

Lab File ID: AE5081

Level: (low/med) LOW

Date Received: 03/09/95

% Moisture: not dec. 15

Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.

COMPOUND

Q

74-87-3-----	Chloromethane	12	U	12u
74-83-9-----	Bromomethane	12	U	12u
75-01-4-----	Vinyl Chloride	12	U	12u
75-00-3-----	Chloroethane	12	U	12u
75-09-2-----	Methylene Chloride	2	BJ	
67-64-1-----	Acetone	10	BJ	
75-15-0-----	Carbon Disulfide	12	U	
75-35-4-----	1,1-Dichloroethene	12	U	
75-34-3-----	1,1-Dichloroethane	12	U	
540-59-0-----	1,2-Dichloroethene (total)	12	U	
67-66-3-----	Chloroform	12	U	
107-06-2-----	1,2-Dichloroethane	12	U	
78-93-3-----	2-Butanone	12	U	
71-55-6-----	1,1,1-Trichloroethane	12	U	
56-23-5-----	Carbon Tetrachloride	12	U	
75-27-4-----	Bromodichloromethane	12	U	
78-87-5-----	1,2-Dichloropropane	12	U	
10061-01-5-----	cis-1,3-Dichloropropene	12	U	
79-01-6-----	Trichloroethene	12	U	
124-48-1-----	Dibromochloromethane	12	U	
79-00-5-----	1,1,2-Trichloroethane	12	U	
71-43-2-----	Benzene	12	U	
10061-02-6-----	trans-1,3-Dichloropropene	12	U	
75-25-2-----	Bromoform	12	U	
108-10-1-----	4-Methyl-2-Pentanone	12	U	
591-78-6-----	2-Hexanone	12	U	
127-18-4-----	Tetrachloroethene	100		100
79-34-5-----	1,1,2,2-Tetrachloroethane	12	U	12u
108-88-3-----	Toluene	12	U	
108-90-7-----	Chlorobenzene	12	U	
100-41-4-----	Ethylbenzene	12	U	
100-42-5-----	Styrene	12	U	
1330-20-7-----	Xylene (total)	12	U	

FORM I VOA

3/90

TUT 007 1737

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS05

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3034 SAS No.: _____ SDG No.: EXS01

Matrix: (soil/water) SOIL Lab Sample ID: AE5081

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5081

Level: (low/med) LOW Date Received: 03/09/95

% Moisture: not dec. 15 Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ITSB01050

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3034 SAS No.: _____ SDG No.: EXS01

Matrix: (soil/water) SOIL Lab Sample ID: AE5074

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5074

Level: (low/med) LOW Date Received: 03/09/95

% Moisture: not dec. 16 Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q	V
74-87-3	-----Chloromethane	12	U	12U
74-83-9	-----Bromomethane	12	U	12U
75-01-4	-----Vinyl Chloride	12	U	12U
75-00-3	-----Chloroethane	12	U	12U
75-09-2	-----Methylene Chloride	3	BJ	
67-64-1	-----Acetone	15	B	
75-15-0	-----Carbon Disulfide	12	U	
75-35-4	-----1,1-Dichloroethene	12	U	
75-34-3	-----1,1-Dichloroethane	12	U	
540-59-0	-----1,2-Dichloroethene (total)	12	U	
67-66-3	-----Chloroform	12	U	
107-06-2	-----1,2-Dichloroethane	12	U	
78-93-3	-----2-Butanone	12	U	
71-55-6	-----1,1,1-Trichloroethane	12	U	
56-23-5	-----Carbon Tetrachloride	12	U	
75-27-4	-----Bromodichloromethane	12	U	
78-87-5	-----1,2-Dichloropropane	12	U	
10061-01-5	-----cis-1,3-Dichloropropene	12	U	
79-01-6	-----Trichloroethene	12	U	
124-48-1	-----Dibromochloromethane	12	U	
79-00-5	-----1,1,2-Trichloroethane	12	U	
71-43-2	-----Benzene	12	U	
10061-02-6	-----trans-1,3-Dichloropropene	12	U	
75-25-2	-----Bromoform	12	U	
108-10-1	-----4-Methyl-2-Pentanone	12	U	
591-78-6	-----2-Hexanone	12	U	
127-18-4	-----Tetrachloroethene	120	U	120
79-34-5	-----1,1,2,2-Tetrachloroethane	12	U	12U
108-88-3	-----Toluene	12	U	
108-90-7	-----Chlorobenzene	12	U	
100-41-4	-----Ethylbenzene	12	U	
100-42-5	-----Styrene	12	U	
1330-20-7	-----Xylene (total)	12	U	

FORM I VOA

3/90

TUT 007 1739

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ITSB01050

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3034 SAS No.: _____ SDG No.: EXS01

Matrix: (soil/water) SOIL Lab Sample ID: AE5074

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5074

Level: (low/med) LOW Date Received: 03/09/95

% Moisture: not dec. 16 Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

TUT 007 1740

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ITSB01100

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3034

SAS No.: _____

SDG No.: EXS01

Matrix: (soil/water) SOIL

Lab Sample ID: AE5075

Sample wt/vol: 5.0 (g/mL) G

Lab File ID: AE5075

Level: (low/med) LOW

Date Received: 03/09/95

% Moisture: not dec. 18

Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Q

✓

74-87-3-----	Chloromethane	12	U	12u
74-83-9-----	Bromomethane	12	U	12u
75-01-4-----	Vinyl Chloride	12	U	12u
75-00-3-----	Chloroethane	12	U	12u
75-09-2-----	Methylene Chloride	3	BJ	
67-64-1-----	Acetone	17	B	
75-15-0-----	Carbon Disulfide	12	U	
75-35-4-----	1,1-Dichloroethene	12	U	
75-34-3-----	1,1-Dichloroethane	12	U	
540-59-0-----	1,2-Dichloroethene (total)	12	U	
67-66-3-----	Chloroform	2	BJ	
107-06-2-----	1,2-Dichloroethane	12	U	
78-93-3-----	2-Butanone	12	U	
71-55-6-----	1,1,1-Trichloroethane	12	U	
56-23-5-----	Carbon Tetrachloride	12	U	
75-27-4-----	Bromodichloromethane	12	U	
78-87-5-----	1,2-Dichloropropane	12	U	
10061-01-5-----	cis-1,3-Dichloropropene	12	U	
79-01-6-----	Trichloroethene	12	U	
124-48-1-----	Dibromochloromethane	12	U	
79-00-5-----	1,1,2-Trichloroethane	12	U	
71-43-2-----	Benzene	12	U	
10061-02-6-----	trans-1,3-Dichloropropene	12	U	
75-25-2-----	Bromoform	12	U	
108-10-1-----	4-Methyl-2-Pentanone	12	U	
591-78-6-----	2-Hexanone	12	U	
127-18-4-----	Tetrachloroethene	2	J	2J
79-34-5-----	1,1,2,2-Tetrachloroethane	12	U	12u
108-88-3-----	Toluene	12	U	
108-90-7-----	Chlorobenzene	12	U	
100-41-4-----	Ethylbenzene	12	U	
100-42-5-----	Styrene	12	U	
1330-20-7-----	Xylene (total)	12	U	

FORM I VOA

3/90

TUT 007 1741

4-3-95

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ITSB01100

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3034 SAS No.: _____ SDG No.: EXS01

Matrix: (soil/water) SOIL Lab Sample ID: AE5075

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5075

Level: (low/med) LOW Date Received: 03/09/95

% Moisture: not dec. 18 Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

TUT 007 1742

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

ITSB01145

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3034 SAS No.: _____ SDG No.: EXS01

Matrix: (soil/water) SOIL Lab Sample ID: AE5076

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5076

Level: (low/med) LOW Date Received: 03/09/95

% Moisture: not dec. 6 Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

74-87-3-----	Chloromethane	11	U	11UJ
74-83-9-----	Bromomethane	11	U	11U
75-01-4-----	Vinyl Chloride	11	U	11UJ
75-00-3-----	Chloroethane	11	U	11U
75-09-2-----	Methylene Chloride	1	BJ	
67-64-1-----	Acetone	6	BJ	
75-15-0-----	Carbon Disulfide	11	U	
75-35-4-----	1,1-Dichloroethene	11	U	
75-34-3-----	1,1-Dichloroethane	11	U	
540-59-0-----	1,2-Dichloroethene (total)	11	U	
67-66-3-----	Chloroform	1	BJ	
107-06-2-----	1,2-Dichloroethane	11	U	
78-93-3-----	2-Butanone	11	U	
71-55-6-----	1,1,1-Trichloroethane	11	U	
56-23-5-----	Carbon Tetrachloride	11	U	
75-27-4-----	Bromodichloromethane	11	U	
78-87-5-----	1,2-Dichloropropane	11	U	
10061-01-5-----	cis-1,3-Dichloropropene	11	U	
79-01-6-----	Trichloroethene	11	U	
124-48-1-----	Dibromochloromethane	11	U	
79-00-5-----	1,1,2-Trichloroethane	11	U	
71-43-2-----	Benzene	11	U	
10061-02-6-----	trans-1,3-Dichloropropene	11	U	
75-25-2-----	Bromoform	11	U	
108-10-1-----	4-Methyl-2-Pentanone	11	U	
591-78-6-----	2-Hexanone	11	U	
127-18-4-----	Tetrachloroethene	11	U	
79-34-5-----	1,1,2,2-Tetrachloroethane	11	U	
108-88-3-----	Toluene	11	U	
108-90-7-----	Chlorobenzene	11	U	
100-41-4-----	Ethylbenzene	11	U	
100-42-5-----	Styrene	11	U	
1330-20-7-----	Xylene (total)	11	U	

FORM I VOA

3/90

TUT 007 1743

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

ITSB01145

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3034 SAS No.: _____ SDG No.: EXS01

Matrix: (soil/water) SOIL Lab Sample ID: AE5076

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5076

Level: (low/med) LOW Date Received: 03/09/95

% Moisture: not dec. 6 Date Analyzed: 03/14/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

TUT 007 1744

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TB030695

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3034

SAS No.: _____

SDG No.: EXS01

Matrix: (soil/water) WATER

Lab Sample ID: AE5082

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: AE5082

Level: (low/med) LOW

Date Received: 03/09/95

% Moisture: not dec. _____

Date Analyzed: 03/15/95

GC Column: RTX624 ID: 53.0 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

Q

74-87-3-----	Chloromethane	10	U	10 uS
74-83-9-----	Bromomethane	10	U	10 u
75-01-4-----	Vinyl Chloride	10	U	~~10 uS~~ 10 u
75-00-3-----	Chloroethane	10	U	10 u
75-09-2-----	Methylene Chloride	2	BJ	
67-64-1-----	Acetone	7	BJ	
75-15-0-----	Carbon Disulfide	10	U	
75-35-4-----	1,1-Dichloroethene	10	U	
75-34-3-----	1,1-Dichloroethane	10	U	
540-59-0-----	1,2-Dichloroethene (total)	10	U	
67-66-3-----	Chloroform	10	U	
107-06-2-----	1,2-Dichloroethane	10	U	
78-93-3-----	2-Butanone	10	U	10 u
71-55-6-----	1,1,1-Trichloroethane	10	U	10 u
56-23-5-----	Carbon Tetrachloride	10	U	
75-27-4-----	Bromodichloromethane	10	U	
78-87-5-----	1,2-Dichloropropane	10	U	
10061-01-5-----	cis-1,3-Dichloropropene	10	U	
79-01-6-----	Trichloroethene	10	U	
124-48-1-----	Dibromochloromethane	10	U	
79-00-5-----	1,1,2-Trichloroethane	10	U	
71-43-2-----	Benzene	10	U	
10061-02-6-----	trans-1,3-Dichloropropene	10	U	
75-25-2-----	Bromoform	10	U	
108-10-1-----	4-Methyl-2-Pentanone	10	U	
591-78-6-----	2-Hexanone	10	U	
127-18-4-----	Tetrachloroethene	10	U	
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U	
108-88-3-----	Toluene	10	U	
108-90-7-----	Chlorobenzene	10	U	
100-41-4-----	Ethylbenzene	10	U	
100-42-5-----	Styrene	10	U	
1330-20-7-----	Xylene (total)	10	U	

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TB030695

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3034 SAS No.: _____ SDG No.: EXS01

Matrix: (soil/water) WATER Lab Sample ID: AE5082

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AE5082

Level: (low/med) LOW Date Received: 03/09/95

% Moisture: not dec. _____ Date Analyzed: 03/15/95

GC Column: RTX624 ID: 53.0 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

DATA VALIDATION: VOLATILES BY GC/MS (CLP)

Project Name: LHENRI

Number:

QC Level:

Lab ID: Middlebrook Report No:Number and Type of Samples: 14 soils + 4 waters

Special Instructions:

I) Holding Times

Field Sample No.	Matrix	Date Collected	Preservation	Analysis Date	Comments
MINMAR1095	water	3-10-95	cool, 4°C	3-21-95	
ER	↓	3-9-95	↓	↓	
EXS23	soil	3-9-95		3-17-95	
EXS23DL	↓	↓		3-18-95	
EXS24				3-18-95	
EXS25				3-17-95	
EXS26				3-17-95	
EXS26DL				3-19-95	
EXS27				3-12-95	
EXS27OL				3-18-95	
EXS27DL				3-18-95	
EXS27DL				3-18-95	
EXS28				3-17-95	
EXS28DL				3-18-95	
EXS29				3-17-95	
EXS29UL				3-19-95	
EXS30				3-18-95	
EXS31				3-17-95	
EXS31DL				3-19-95	
EXS32	↓	↓	↓	3-18-95	

Notes: Units were received at 0°C.
Wals EL #13/95

Recommended Action:

All samples met Holding Times.

TUT 007 1747

Reviewed By/Date: [Signature] 4/3/95

QA Concurrence/Date:

[Signature] 4-4-95
 01 (5/91) Revision 3

II) Instrument Performance: Bromofluorobenzene (BFB) Standard

Check if "OK"

BFB Run Date	GC/MS ID	Form VA Present?	Data Transcribed?	Significant Figures?	Ratio Calculations?	Background Subtractions?	Meets Specifications?	Comment
12-15-94	I500A	✓	✓	✓	✓	✓	✓	
03-17-95	↓	✓	✓	✓	✓	✓	✓	
03-18-95	↓	✓	✓	✓	✓	✓	✓	
03-19-95	↓	✓	✓	✓	✓	✓	✓	
03-10-95	Q500A	✓	✓	✓	✓	✓	✓	
03-21-95	↓	✓	✓	✓	✓	✓	✓	

Recommended Action:*None.***III) Calibration****A) Initial Calibration**Form VI A present? Yes**1. Calculation Check - Mean RRF (minimum 1 compound per calibration)**

Calibration Date	GC/MS ID	Ref.	Matrix	Filename	Selected Compound	Mean RRF	Agree with Lab Report ?
12-15-94	I500A	1	Soil	WI12154-E	Chloromethane	.936	Yes
3-18-95	↓	2	↓	WI03131,3,3,4,5	↓	.938	Yes
3-10-95	Q500A	1	Water	Q103101W,102W-105W	↓	.809	Yes

2. Any Mean RRF < 0.05 ?*No*

(If "yes" then list:)

Compound	Mean RRF	GC/MS ID	Calibration Date	Comments

Reviewed By/Date:

Allye 4/3/95

QA Concurrence/Date:

Teresa M. Jackson 4-5-95

01.15.01 Revision

III) Calibration (Continued)**A) Initial Calibration (Continued)****3. Calculation Check - % RSD**

(Minimum 1 compound per calibration, may use same as for mean RRF)

Calibration Date	GC/MS ID	Compound	Percent RSD	Agree with Lab Report ?
12/15/94	I500A	Edybenzene	6.1	yes
3/18/95	I500A	Chlorobenzene	6.5	yes
3/10/95	Q500A	acetone	5.7	yes

4. Any % RSD > 30% ?

yes

(If "yes" then list:)

Compound	GC/MS ID	Calibration Date	Percent RSD	Comments
Chlorobenzene	Q500A	3/10/95	33.5	
				R
				4/3/95

Recommended Action:

90% RSD > 30%

positive - J

non detect - UT

Dropping high or low number does not change the result below 30%

B) Continuing CalibrationForm VIIA present? yes**1. Any RRF < 0.05 ?**

no

(If "yes" then list:)

Standard Filename	Calibration Date	GC/MS ID	Compound	RRF

Reviewed By/Date:

ALP 4/3/95

QA Concurrence/Date:

Teresa M. Jackson 4-5-95

Revision 2-3

B) Continuing Calibration (Continued)

2. Calculation Check - % D (Minimum 1 compound per standard)

[illegible]

3. Any % D > 25%? no (If "yes" then list:)

[illegible]

Recommended Action:

90 D > 25% positive - J
non detect - 45

~~the form 7 for 3/21/95 should read insured ID ISOWA~~

Reviewed By/Date:

9/13/95

QA Concurrence/Date

Ter-Blah 4-5-95

01/18/91 Revision 1

IV) Blanks

1. Form IV A present? yes
2. Method blank reported for each matrix, concentration level, GC/MS system as appropriate? yes
If no, explain:

3. Any common lab contaminants detected? yes (If "yes" then list:)

Blank ID	GC/MS ID	Date Run	Concentration (specify units)			
			Methylene Chloride	Acetone	Toluene	2-butanone
VBKAE7781	ISDOA	3/17/95	8 ug/kg	12 ug/kg		2 ug/kg
VBKAE7791	ISDOA	3/18/95	6 ug/kg	3 ug/kg		
VBKAE7817	ISDOA	3/19/95		5 ug/kg		
VBKAE7045	QSDOA	3/21/95	1 ug/L	3 ug/L		2 ug/L

4. Other TCLs or TICs detected? yes (If "yes" then list:)

Blank ID	GC/MS ID	Date Run	Compound	Concentration (specify units)
VBKAE7781	ISDOA	3/17/95	2-butanone	1 ug/kg
			Xylene	1 ug/kg
			unknown R.T. 2.00	9 ug/kg
VBKAE7817	ISDOA	3/19/95	2-butanone	1 ug/kg
			Xylene	2 ug/kg
VBKAE7045	QSDOA	3/21/95	2-butanone	1 ug/L
			1,2-Dichloroethane	1 ug/L

5. Any contaminants detected in FB, TB, or ER samples? yes

Blank ID	Date Collected	Concentration (specify units)			
		Methylene Chloride	Acetone	Toluene	Other (specify)
FB MAR 95	3/4/95		4 ug/L BT		1,2-Dichloroethane 1 ug/L
TB MAR 95	3/4/95	1 ug/L BT	4 ug/L BT		1,2-Dichloroethane 1 ug/L
ER	3/9/95	1 BT	4 BT		Carbon Disulfide 1 BT
					1,2-Dichloroethane 1 BT

Note: DO NOT list compounds adjusted to "ND" based on associated lab blank contamination in Section IV. 5.

Recommended Action:

Apply the 10X, 5X, or < CRDL rules to any sample with associated blank contamination.

V) Surrogate Recovery

1. Form II A present? yes All samples listed? yes
- Entries agree with raw data? yes (If "no" for any answer explain below:)

Reviewed By/Date: 4/3/95QA Concurrence/Date: 4-5-95

01/18/91 Revision 3-5

TUT 007 1752

V) Surrogate Recovery (Continued)2. Any runs with one (1) or more recoveries outside limits? W (If "yes" then list:)

Sample ID	Surrogate Compound	Original % Recovery	Re-Run % Recovery	Comments
				<u>W</u> 4/3/95

All method blank surrogates within limits? yes (If "no" explain below:)**Recommended Action:**no recommended action ✓**VI) Matrix Spike / Matrix Spike Duplicates**1. Number of pairs analyzed: not analyzed

Matrix:

soilwater

Frequency:

2. Form III A present? Results entries agree with raw data? % R, RPD Calculations OK? W 4/3/953. All % R, RPD within limits?

(If "no" then list:)

Sample ID	Spike Compound	% R MS/MSD	RPD	Comments

Recommended Action:no recommended actionNo MS/MSD reported with this package. Batch QC may be pulled if needed.Reviewed By/Date: 4/3/95QA Concurrence/Date: 4-5-95

01.1891 Revision 3-0

VII) Field Duplicates1. Are original/field duplicate pairs identifiable? no (If "yes" then list:)

Matrix	Original Sample No.	Duplicate Sample No.

Matrix	Original Sample No.	Duplicate Sample No.

no
4/3/952. Overall frequency: N/A

3. Comments (Evaluate RPDs for positive paired analytes):

N/A**VIII) Internal Standards Performance**1. Form VIIIA present? : yesAreas/RT agree with raw data? yes2. All sample/blank IS areas within limits? yesList exceptions: N/A3. All sample/blank IS RTs within 30 seconds of standard IS RT? yesList exceptions: N/A**Recommended Action:**no recommended actionReviewed By/Date: [Signature] 4/3/95QA Concurrence/Date: [Signature]

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4-5-95

TUT 007 1754

[illegible]

See volatiles organics analysis data sheet for compound
qualifiers

Reviewed By/Date:

QA Concurrence/Date:

01/18/91 Revision 3-8

(X) Tentatively Identified Compounds

1. Have all peaks that should be searched, been searched and reported (Form I E)?

yes2. Any TICs found in samples also in associated blanks? no3. Are reasonable identifications reported? yes4. Any TCL compounds reported as TICs? no**Recommended Action:**no recommended action

✓

XI) System Performance

Check for and explain any of the following:

1. Abrupt RIC baseline shift:

2. High background or RT shifts:

3. Baseline rise at high temperature:

4. Extraneous peaks:

5. Loss of peak resolution:

6. Peak tailing or splitting:

4/13/95**Recommended Action:**no recommended action

✓

Reviewed By/Date:

Alaska 4/13/95

QA Concurrence/Date:

Tina M. Baker 4-5-95

01/18/91 Revision 3-9

XII) Overall Assessment

1. Holding times were met.
2. Initial Calibration - % RSD > 30%, positive - J
non detect - 45
3. Continuing Calibration - % D > 25% positive - J
non detect - 45
4. Blank Contamination noted in all method blanks - apply
the 10X, SK, or CERCL rules to any sample with
associated blank contamination.
5. See volatile organics analysis data sheet for compound
qualifiers.

pk
4/3/95

Reviewed By/Date:

[Signature] 4/3/95

QA Concurrence/Date:

[Signature] 4-5-95

01/18/91 Revision 3-10

TUT 007 1757

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

DCWMAR1095

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) WATER Lab Sample ID: AE5463

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AE5463

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. _____ Date Analyzed: 03/21/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS:		Q	✓
		(ug/L or ug/Kg)	UG/L		
74-87-3	Chloromethane	6	J	6J	
74-83-9	Bromomethane	50	U	50u	
75-01-4	Vinyl Chloride	50	U	50u	
75-00-3	Chloroethane	50	U	50u	
75-09-2	Methylene Chloride	50	U	50u	
67-64-1	Acetone	45	BJ	45J	
75-15-0	Carbon Disulfide	50	U	50u	
75-35-4	1,1-Dichloroethene	50	U		
75-34-3	1,1-Dichloroethane	50	U		
540-59-0	1,2-Dichloroethene (total)	50	U		
67-66-3	Chloroform	50	U		
107-06-2	1,2-Dichloroethane	50	U		
78-93-3	2-Butanone	8	BJ	50u	
71-55-6	1,1,1-Trichloroethane	50	U	50u	
56-23-5	Carbon Tetrachloride	50	U		
75-27-4	Bromodichloromethane	50	U		
78-87-5	1,2-Dichloropropane	50	U		
10061-01-5	cis-1,3-Dichloropropene	50	U		
79-01-6	Trichloroethene	50	U		
124-48-1	Dibromochloromethane	50	U		
79-00-5	1,1,2-Trichloroethane	50	U		
71-43-2	Benzene	50	U		
10061-02-6	trans-1,3-Dichloropropene	50	U		
75-25-2	Bromoform	50	U		
108-10-1	4-Methyl-2-Pentanone	50	U		
591-78-6	2-Hexanone	50	U		
127-18-4	Tetrachloroethene	50	U		
79-34-5	1,1,2,2-Tetrachloroethane	50	U		
108-88-3	Toluene	50	U		
108-90-7	Chlorobenzene	50	U		
100-41-4	Ethylbenzene	50	U		
100-42-5	Styrene	50	U		
1330-20-7	Xylene (total)	50	U		

FORM I VOA

3/90

TUT 007 1758

TJ
4-5-95

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

DCWMAR1095

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) WATER Lab Sample ID: AE5463

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AE5463

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. _____ Date Analyzed: 03/21/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 5.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EQUIPMENT RIN

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) WATER Lab Sample ID: AE5461

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AE5461R

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. _____ Date Analyzed: 03/21/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/L</u>	Q	V
74-87-3	Chloromethane	10	U	10u
74-83-9	Bromomethane	10	U	10u
75-01-4	Vinyl Chloride	10	U	10u
75-00-3	Chloroethane	10	U	10u
75-09-2	Methylene Chloride	1	BJ	10u
67-64-1	Acetone	4	BJ	10u
75-15-0	Carbon Disulfide	1	J	1J
75-35-4	1,1-Dichloroethene	10	U	10u
75-34-3	1,1-Dichloroethane	10	U	10u
540-59-0	1,2-Dichloroethene (total)	10	U	10u
67-66-3	Chloroform	10	U	10u
107-06-2	1,2-Dichloroethane	1	J	1J
78-93-3	2-Butanone	10	U	10u
71-55-6	1,1,1-Trichloroethane	10	U	10u
56-23-5	Carbon Tetrachloride	10	U	10u
75-27-4	Bromodichloromethane	10	U	10u
78-87-5	1,2-Dichloropropane	10	U	10u
10061-01-5	cis-1,3-Dichloropropene	10	U	10u
79-01-6	Trichloroethene	10	U	10u
124-48-1	Dibromochloromethane	10	U	10u
79-00-5	1,1,2-Trichloroethane	10	U	10u
71-43-2	Benzene	10	U	10u
10061-02-6	trans-1,3-Dichloropropene	10	U	10u
75-25-2	Bromoform	10	U	10u
108-10-1	4-Methyl-2-Pentanone	10	U	10u
591-78-6	2-Hexanone	10	U	10u
127-18-4	Tetrachloroethene	10	U	10u
79-34-5	1,1,2,2-Tetrachloroethane	10	U	10u
108-88-3	Toluene	10	U	10u
108-90-7	Chlorobenzene	10	U	10u
100-41-4	Ethylbenzene	10	U	10u
100-42-5	Styrene	10	U	10u
1330-20-7	Xylene (total)	10	U	10u

FORM I VOA

TUT 007 1760

3/90

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EQUIPMENTRIN

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) WATER Lab Sample ID: AE5461

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AE5461R

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. _____ Date Analyzed: 03/21/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS23

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5446

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5446

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 16 Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

74-87-3-----	Chloromethane	12	U	12uJ
74-83-9-----	Bromomethane	12	U	12u
75-01-4-----	Vinyl Chloride	12	U	↓
75-00-3-----	Chloroethane	12	U	12u
75-09-2-----	Methylene Chloride	4	BJ	12uJ
67-64-1-----	Acetone	12	B	12uJ
75-15-0-----	Carbon Disulfide	12	U	12u
75-35-4-----	1,1-Dichloroethene	12	U	↓
75-34-3-----	1,1-Dichloroethane	12	U	12uJ
540-59-0-----	1,2-Dichloroethene (total)	12	U	↓
67-66-3-----	Chloroform	12	U	12uJ
107-06-2-----	1,2-Dichloroethane	12	U	↓
78-93-3-----	2-Butanone	12	U	12uJ
71-55-6-----	1,1,1-Trichloroethane	12	U	12u
56-23-5-----	Carbon Tetrachloride	12	U	↓
75-27-4-----	Bromodichloromethane	12	U	12uJ
78-87-5-----	1,2-Dichloropropane	12	U	↓
10061-01-5-----	cis-1,3-Dichloropropene	12	U	12uJ
79-01-6-----	Trichloroethene	12	U	↓
124-48-1-----	Dibromochloromethane	12	U	12uJ
79-00-5-----	1,1,2-Trichloroethane	12	U	↓
71-43-2-----	Benzene	12	U	12uJ
10061-02-6-----	trans-1,3-Dichloropropene	12	U	↓
75-25-2-----	Bromoform	12	U	12uJ
108-10-1-----	4-Methyl-2-Pentanone	12	U	↓
591-78-6-----	2-Hexanone	12	U	12uJ
127-18-4-----	Tetrachloroethene	320	E	Report
79-34-5-----	1,1,2,2-Tetrachloroethane	12	U	12u
108-88-3-----	Toluene	12	U	↓
108-90-7-----	Chlorobenzene	12	U	12uJ
100-41-4-----	Ethylbenzene	12	U	↓
100-42-5-----	Styrene	12	U	12uJ
1330-20-7-----	Xylene (total)	12	U	↓

FORM I VOA

TUT 007 1762

3/90

4-5-95
TJ

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS23

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5446

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5446

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 16 Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS23DL

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5446

Sample wt/vol: 1.0 (g/mL) G Lab File ID: AE5446D

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 16 Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND		
74-87-3-----	Chloromethane	60	U
74-83-9-----	Bromomethane	60	U
75-01-4-----	Vinyl Chloride	60	U
75-00-3-----	Chloroethane	60	U
75-09-2-----	Methylene Chloride	12	BDJ
67-64-1-----	Acetone	22	BDJ
75-15-0-----	Carbon Disulfide	60	U
75-35-4-----	1,1-Dichloroethene	60	U
75-34-3-----	1,1-Dichloroethane	60	U
540-59-0-----	1,2-Dichloroethene (total)	60	U
67-66-3-----	Chloroform	60	U
107-06-2-----	1,2-Dichloroethane	60	U
78-93-3-----	2-Butanone	60	U
71-55-6-----	1,1,1-Trichloroethane	60	U
56-23-5-----	Carbon Tetrachloride	60	U
75-27-4-----	Bromodichloromethane	60	U
78-87-5-----	1,2-Dichloropropane	60	U
10061-01-5-----	cis-1,3-Dichloropropene	60	U
79-01-6-----	Trichloroethene	60	U
124-48-1-----	Dibromochloromethane	60	U
79-00-5-----	1,1,2-Trichloroethane	60	U
71-43-2-----	Benzene	60	U
10061-02-6-----	trans-1,3-Dichloropropene	60	U
75-25-2-----	Bromoform	60	U
108-10-1-----	4-Methyl-2-Pentanone	60	U
591-78-6-----	2-Hexanone	60	U
127-18-4-----	Tetrachloroethene	290	D
79-34-5-----	1,1,2,2-Tetrachloroethane	60	U
108-88-3-----	Toluene	60	U
108-90-7-----	Chlorobenzene	60	U
100-41-4-----	Ethylbenzene	60	U
100-42-5-----	Styrene	60	U
1330-20-7-----	Xylene (total)	60	U

2/16/95

290
Rep
Orig.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS23DL

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3067

SAS No.: _____

SDG No.: DCW

Matrix: (soil/water) SOIL

Lab Sample ID: AE5446

Sample wt/vol: 1.0 (g/mL) G

Lab File ID: AE5446D

Level: (low/med) LOW

Date Received: 03/13/95

% Moisture: not dec. 16

Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS24

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3067

SAS No.: _____

SDG No.: DCW

Matrix: (soil/water) SOIL

Lab Sample ID: AE5447

Sample wt/vol: 5.0 (g/mL) G

Lab File ID: AE4557R

Level: (low/med) LOW

Date Received: 03/13/95

% Moisture: not dec. 15

Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.

COMPOUND

Q

74-87-3-----	Chloromethane	12	U	24
74-83-9-----	Bromomethane	12	U	
75-01-4-----	Vinyl Chloride	12	U	
75-00-3-----	Chloroethane	12	U	
75-09-2-----	Methylene Chloride	3	BJ	124
67-64-1-----	Acetone	9	BJ	124
75-15-0-----	Carbon Disulfide	12	U	124
75-35-4-----	1,1-Dichloroethene	12	U	
75-34-3-----	1,1-Dichloroethane	12	U	
540-59-0-----	1,2-Dichloroethene (total)	12	U	
67-66-3-----	Chloroform	12	U	
107-06-2-----	1,2-Dichloroethane	12	U	
78-93-3-----	2-Butanone	12	U	
71-55-6-----	1,1,1-Trichloroethane	12	U	
56-23-5-----	Carbon Tetrachloride	12	U	
75-27-4-----	Bromodichloromethane	12	U	
78-87-5-----	1,2-Dichloropropane	12	U	
10061-01-5-----	cis-1,3-Dichloropropene	12	U	
79-01-6-----	Trichloroethene	12	U	
124-48-1-----	Dibromochloromethane	12	U	
79-00-5-----	1,1,2-Trichloroethane	12	U	
71-43-2-----	Benzene	12	U	
10061-02-6-----	trans-1,3-Dichloropropene	12	U	
75-25-2-----	Bromoform	12	U	
108-10-1-----	4-Methyl-2-Pentanone	12	U	
591-78-6-----	2-Hexanone	12	U	
127-18-4-----	Tetrachloroethene	21		21
79-34-5-----	1,1,2,2-Tetrachloroethane	12	U	124
108-88-3-----	Toluene	1	J	124
108-90-7-----	Chlorobenzene	12	U	124
100-41-4-----	Ethylbenzene	12	U	
100-42-5-----	Styrene	12	U	
1330-20-7-----	Xylene (total)	12	U	

FORM I VOA

3/90

TUT 007 1766

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS24

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3067

SAS No.: _____

SDG No.: DCW

Matrix: (soil/water) SOIL

Lab Sample ID: AE5447

Sample wt/vol: 5.0 (g/mL) G

Lab File ID: AE4557R

Level: (low/med) LOW

Date Received: 03/13/95

% Moisture: not dec. 15

Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS25

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3067

SAS No.: _____

SDG No.: DCW

Matrix: (soil/water) SOIL

Lab Sample ID: AE5448

Sample wt/vol: 5.0 (g/mL) G

Lab File ID: AE5448

Level: (low/med) LOW

Date Received: 03/13/95

% Moisture: not dec. 12

Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Q

74-87-3-----	Chloromethane	11	U	114
74-83-9-----	Bromomethane	11	U	114
75-01-4-----	Vinyl Chloride	11	U	↓
75-00-3-----	Chloroethane	11	U	114
75-09-2-----	Methylene Chloride	4	BJ	134
67-64-1-----	Acetone	13	B	114
75-15-0-----	Carbon Disulfide	11	U	↓
75-35-4-----	1,1-Dichloroethene	11	U	114
75-34-3-----	1,1-Dichloroethane	11	U	↓
540-59-0-----	1,2-Dichloroethene (total)	11	U	114
67-66-3-----	Chloroform	11	U	↓
107-06-2-----	1,2-Dichloroethane	11	U	114
78-93-3-----	2-Butanone	11	U	↓
71-55-6-----	1,1,1-Trichloroethane	11	U	114
56-23-5-----	Carbon Tetrachloride	11	U	↓
75-27-4-----	Bromodichloromethane	11	U	114
78-87-5-----	1,2-Dichloropropane	11	U	↓
10061-01-5-----	cis-1,3-Dichloropropene	11	U	114
79-01-6-----	Trichloroethene	11	U	↓
124-48-1-----	Dibromochloromethane	11	U	114
79-00-5-----	1,1,2-Trichloroethane	11	U	↓
71-43-2-----	Benzene	11	U	114
10061-02-6-----	trans-1,3-Dichloropropene	11	U	↓
75-25-2-----	Bromoform	11	U	114
108-10-1-----	4-Methyl-2-Pentanone	11	U	↓
591-78-6-----	2-Hexanone	11	U	114
127-18-4-----	Tetrachloroethene	190		↓
79-34-5-----	1,1,2,2-Tetrachloroethane	11	U	190
108-88-3-----	Toluene	11	U	114
108-90-7-----	Chlorobenzene	11	U	↓
100-41-4-----	Ethylbenzene	11	U	114
100-42-5-----	Styrene	11	U	↓
1330-20-7-----	Xylene (total)	11	U	114

FORM I VOA

TUT 007 1768

3/90

4-5-95

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS25

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5448

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5448

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 12 Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

TUT 007 1769

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS26

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3067

SAS No.: _____

SDG No.: DCW

Matrix: (soil/water) SOIL

Lab Sample ID: AE5449

Sample wt/vol: 5.0 (g/mL) G

Lab File ID: AE5449

Level: (low/med) LOW

Date Received: 03/13/95

% Moisture: not dec. 16

Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

(ug/L or ug/Kg) UG/KG

Q

CAS NO.	COMPOUND			
74-87-3	Chloromethane	12	U	12uJ
74-83-9	Bromomethane	12	U	12u
75-01-4	Vinyl Chloride	12	U	↓
75-00-3	Chloroethane	12	U	12u
75-09-2	Methylene Chloride	5	BJ	13uJ
67-64-1	Acetone	13	B	12u
75-15-0	Carbon Disulfide	12	U	↓
75-35-4	1,1-Dichloroethene	12	U	12u
75-34-3	1,1-Dichloroethane	12	U	↓
540-59-0	1,2-Dichloroethene (total)	12	U	12uJ
67-66-3	Chloroform	12	U	↓
107-06-2	1,2-Dichloroethane	12	U	12uJ
78-93-3	2-Butanone	12	U	12u
71-55-6	1,1,1-Trichloroethane	12	U	↓
56-23-5	Carbon Tetrachloride	12	U	12u
75-27-4	Bromodichloromethane	12	U	↓
78-87-5	1,2-Dichloropropane	12	U	12uJ
10061-01-5	cis-1,3-Dichloropropene	12	U	↓
79-01-6	Trichloroethene	12	U	12u
124-48-1	Dibromochloromethane	12	U	↓
79-00-5	1,1,2-Trichloroethane	12	U	12uJ
71-43-2	Benzene	12	U	↓
10061-02-6	trans-1,3-Dichloropropene	12	U	12u
75-25-2	Bromoform	12	U	↓
108-10-1	4-Methyl-2-Pentanone	12	U	12uJ
591-78-6	2-Hexanone	12	U	↓
127-18-4	Tetrachloroethene	800	E	Report
79-34-5	1,1,2,2-Tetrachloroethane	12	U	12u
108-88-3	Toluene	2	J	2J
108-90-7	Chlorobenzene	12	U	12u
100-41-4	Ethylbenzene	12	U	↓
100-42-5	Styrene	12	U	12uJ
1330-20-7	Xylene (total)	12	U	↓

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TUT 007 1770

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS26

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5449

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5449

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 16 Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS26DL

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3067

SAS No.: _____

SDG No.: DCW

Matrix: (soil/water) SOIL

Lab Sample ID: AE5449

Sample wt/vol: 1.0 (g/mL) G

Lab File ID: AE5449D2

Level: (low/med) LOW

Date Received: 03/13/95

% Moisture: not dec. 16

Date Analyzed: 03/19/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.

COMPOUND

Q

74-87-3-----	Chloromethane	60	U	Repor Origina ↓
74-83-9-----	Bromomethane	60	U	
75-01-4-----	Vinyl Chloride	60	U	
75-00-3-----	Chloroethane	60	U	
75-09-2-----	Methylene Chloride	60	U	
67-64-1-----	Acetone	37	BDJ	
75-15-0-----	Carbon Disulfide	60	U	
75-35-4-----	1,1-Dichloroethene	60	U	
75-34-3-----	1,1-Dichloroethane	60	U	
540-59-0-----	1,2-Dichloroethene (total)	60	U	
67-66-3-----	Chloroform	60	U	
107-06-2-----	1,2-Dichloroethane	60	U	
78-93-3-----	2-Butanone	60	U	
71-55-6-----	1,1,1-Trichloroethane	60	U	
56-23-5-----	Carbon Tetrachloride	60	U	
75-27-4-----	Bromodichloromethane	60	U	
78-87-5-----	1,2-Dichloropropane	60	U	
10061-01-5-----	cis-1,3-Dichloropropene	60	U	
79-01-6-----	Trichloroethene	60	U	
124-48-1-----	Dibromochloromethane	60	U	
79-00-5-----	1,1,2-Trichloroethane	60	U	
71-43-2-----	Benzene	60	U	
10061-02-6-----	trans-1,3-Dichloropropene	60	U	
75-25-2-----	Bromoform	60	U	
108-10-1-----	4-Methyl-2-Pentanone	60	U	
591-78-6-----	2-Hexanone	60	U	
127-18-4-----	Tetrachloroethene	300	D	300D
79-34-5-----	1,1,2,2-Tetrachloroethane	60	U	Repor Origina ↓
108-88-3-----	Toluene	60	U	
108-90-7-----	Chlorobenzene	60	U	
100-41-4-----	Ethylbenzene	60	U	
100-42-5-----	Styrene	60	U	↓
1330-20-7-----	Xylene (total)	60	U	

FORM I VOA

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TUT 007 1772

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS26DL

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3067

SAS No.: _____

SDG No.: DCW

Matrix: (soil/water) SOIL

Lab Sample ID: AE5449

Sample wt/vol: 1.0 (g/mL) G

Lab File ID: AE5449D2

Level: (low/med) LOW

Date Received: 03/13/95

% Moisture: not dec. 16

Date Analyzed: 03/19/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS27

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5450

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5450

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 18 Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	Q	V
74-87-3	Chloromethane	12 U	12uJ
74-83-9	Bromomethane	12 U	12u
75-01-4	Vinyl Chloride	12 U	↓
75-00-3	Chloroethane	12 U	12u
75-09-2	Methylene Chloride	4 BJ	26uJ
67-64-1	Acetone	26 B	12u
75-15-0	Carbon Disulfide	12 U	↓
75-35-4	1,1-Dichloroethene	12 U	12u
75-34-3	1,1-Dichloroethane	12 U	↓
540-59-0	1,2-Dichloroethene (total)	12 U	12u
67-66-3	Chloroform	12 U	↓
107-06-2	1,2-Dichloroethane	12 U	12uJ
78-93-3	2-Butanone	5 BJ	12u
71-55-6	1,1,1-Trichloroethane	12 U	↓
56-23-5	Carbon Tetrachloride	12 U	12u
75-27-4	Bromodichloromethane	12 U	↓
78-87-5	1,2-Dichloropropane	12 U	12u
10061-01-5	cis-1,3-Dichloropropene	12 U	↓
79-01-6	Trichloroethene	12 U	12u
124-48-1	Dibromochloromethane	12 U	↓
79-00-5	1,1,2-Trichloroethane	12 U	12u
71-43-2	Benzene	2 J	↓
10061-02-6	trans-1,3-Dichloropropene	12 U	12u
75-25-2	Bromoform	12 U	↓
108-10-1	4-Methyl-2-Pentanone	12 U	12u
591-78-6	2-Hexanone	12 U	↓
127-18-4	Tetrachloroethene	980 E	Report
79-34-5	1,1,2,2-Tetrachloroethane	12 U	12u
108-88-3	Toluene	4 J	4J
108-90-7	Chlorobenzene	12 U	12u
100-41-4	Ethylbenzene	12 U	↓
100-42-5	Styrene	12 U	12u
1330-20-7	Xylene (total)	12 U	↓

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TUT 007 1774

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS27

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5450

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5450

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 18 Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	16.40	6	J

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS27DL

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3067

SAS No.: _____

SDG No.: DCW

Matrix: (soil/water) SOIL

Lab Sample ID: AE5450

Sample wt/vol: 1.0 (g/mL) G

Lab File ID: AE5450D

Level: (low/med) LOW

Date Received: 03/13/95

% Moisture: not dec. 18

Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Q

74-87-3-----	Chloromethane	61	U	Report Original ↓
74-83-9-----	Bromomethane	61	U	
75-01-4-----	Vinyl Chloride	61	U	
75-00-3-----	Chloroethane	61	U	
75-09-2-----	Methylene Chloride	16	BDJ	
67-64-1-----	Acetone	38	BDJ	
75-15-0-----	Carbon Disulfide	61	U	
75-35-4-----	1,1-Dichloroethene	61	U	
75-34-3-----	1,1-Dichloroethane	61	U	
540-59-0-----	1,2-Dichloroethene (total)	61	U	
67-66-3-----	Chloroform	61	U	
107-06-2-----	1,2-Dichloroethane	61	U	
78-93-3-----	2-Butanone	7	DJ	
71-55-6-----	1,1,1-Trichloroethane	61	U	
56-23-5-----	Carbon Tetrachloride	61	U	
75-27-4-----	Bromodichloromethane	61	U	
78-87-5-----	1,2-Dichloropropane	61	U	
10061-01-5-----	cis-1,3-Dichloropropene	61	U	
79-01-6-----	Trichloroethene	61	U	
124-48-1-----	Dibromochloromethane	61	U	
79-00-5-----	1,1,2-Trichloroethane	61	U	Report Original ↓
71-43-2-----	Benzene	61	U	
10061-02-6-----	trans-1,3-Dichloropropene	61	U	
75-25-2-----	Bromoform	61	U	
108-10-1-----	4-Methyl-2-Pentanone	61	U	
591-78-6-----	2-Hexanone	61	U	
127-18-4-----	Tetrachloroethene	850	D	
79-34-5-----	1,1,2,2-Tetrachloroethane	61	U	
108-88-3-----	Toluene	61	U	
108-90-7-----	Chlorobenzene	61	U	
100-41-4-----	Ethylbenzene	61	U	Report Original ↓
100-42-5-----	Styrene	61	U	
1330-20-7-----	Xylene (total)	61	U	

FORM I VOA

TJ

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TUT 007 1776

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS27DL

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5450

Sample wt/vol: 1.0 (g/mL) G Lab File ID: AE5450D

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 18 Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS27DU

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5459

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5459

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 15 Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1. 104-76-7	1-HEXANOL, 2-ETHYL-	16.37	17	JN	170

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS27DUDL

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3067

SAS No.: _____

SDG No.: DCW

Matrix: (soil/water) SOIL

Lab Sample ID: AE5459

Sample wt/vol: 1.0 (g/mL) G

Lab File ID: AE5459D

Level: (low/med) LOW

Date Received: 03/13/95

% Moisture: not dec. 15

Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.

COMPOUND

Q

74-87-3-----	Chloromethane	59	U	Report Original
74-83-9-----	Bromomethane	59	U	
75-01-4-----	Vinyl Chloride	59	U	
75-00-3-----	Chloroethane	59	U	
75-09-2-----	Methylene Chloride	12	BDJ	
67-64-1-----	Acetone	23	BDJ	
75-15-0-----	Carbon Disulfide	59	U	
75-35-4-----	1,1-Dichloroethene	59	U	
75-34-3-----	1,1-Dichloroethane	59	U	
540-59-0-----	1,2-Dichloroethene (total)	59	U	
67-66-3-----	Chloroform	59	U	
107-06-2-----	1,2-Dichloroethane	59	U	
78-93-3-----	2-Butanone	59	U	
71-55-6-----	1,1,1-Trichloroethane	59	U	
56-23-5-----	Carbon Tetrachloride	59	U	
75-27-4-----	Bromodichloromethane	59	U	
78-87-5-----	1,2-Dichloropropane	59	U	
10061-01-5-----	cis-1,3-Dichloropropene	59	U	
79-01-6-----	Trichloroethene	59	U	
124-48-1-----	Dibromochloromethane	59	U	
79-00-5-----	1,1,2-Trichloroethane	59	U	
71-43-2-----	Benzene	59	U	
10061-02-6-----	trans-1,3-Dichloropropene	59	U	
75-25-2-----	Bromoform	59	U	
108-10-1-----	4-Methyl-2-Pentanone	59	U	
591-78-6-----	2-Hexanone	59	U	
127-18-4-----	Tetrachloroethene	570	D	
79-34-5-----	1,1,2,2-Tetrachloroethane	59	U	
108-88-3-----	Toluene	59	U	
108-90-7-----	Chlorobenzene	59	U	
100-41-4-----	Ethylbenzene	59	U	
100-42-5-----	Styrene	59	U	
1330-20-7-----	Xylene (total)	59	U	

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4-5-95

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS27DUDL

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5459

Sample wt/vol: 1.0 (g/mL) G Lab File ID: AE5459D

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 15 Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS28

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5451

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5451

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 10 Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>		Q	V
74-87-3	Chloromethane	11	U	11uJ	
74-83-9	Bromomethane	11	U	11u	
75-01-4	Vinyl Chloride	11	U		
75-00-3	Chloroethane	11	U		
75-09-2	Methylene Chloride	4	BJ	11u	
67-64-1	Acetone	9	BJ	11uJ	
75-15-0	Carbon Disulfide	11	U	11u	
75-35-4	1,1-Dichloroethene	11	U		
75-34-3	1,1-Dichloroethane	11	U		
540-59-0	1,2-Dichloroethene (total)	11	U		
67-66-3	Chloroform	11	U		
107-06-2	1,2-Dichloroethane	11	U		
78-93-3	2-Butanone	11	U	11uJ	
71-55-6	1,1,1-Trichloroethane	11	U	11u	
56-23-5	Carbon Tetrachloride	11	U		
75-27-4	Bromodichloromethane	11	U		
78-87-5	1,2-Dichloropropane	11	U		
10061-01-5	cis-1,3-Dichloropropene	11	U		
79-01-6	Trichloroethene	11	U		
124-48-1	Dibromochloromethane	11	U		
79-00-5	1,1,2-Trichloroethane	11	U		
71-43-2	Benzene	11	U		
10061-02-6	trans-1,3-Dichloropropene	11	U		
75-25-2	Bromoform	11	U		
108-10-1	4-Methyl-2-Pentanone	11	U		
591-78-6	2-Hexanone	11	U		
127-18-4	Tetrachloroethene	400	E	Report DI	
79-34-5	1,1,2,2-Tetrachloroethane	11	U	11u	
108-88-3	Toluene	11	U		
108-90-7	Chlorobenzene	11	U		
100-41-4	Ethylbenzene	11	U		
100-42-5	Styrene	11	U		
1330-20-7	Xylene (total)	11	U		

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS28

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5451

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5451

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 10 Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

TUT 007 1783

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS28DL

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3067

SAS No.: _____

SDG No.: DCW

Matrix: (soil/water) SOIL

Lab Sample ID: AE5451

Sample wt/vol: 1.0 (g/mL) G

Lab File ID: AE5451D

Level: (low/med) LOW

Date Received: 03/13/95

% Moisture: not dec. 10

Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Q

74-87-3-----	Chloromethane	56	U	Repor Origin ↓ 210T Repor Origin ↓
74-83-9-----	Bromomethane	56	U	
75-01-4-----	Vinyl Chloride	56	U	
75-00-3-----	Chloroethane	56	U	
75-09-2-----	Methylene Chloride	12	BDJ	
67-64-1-----	Acetone	19	BDJ	
75-15-0-----	Carbon Disulfide	56	U	
75-35-4-----	1,1-Dichloroethene	56	U	
75-34-3-----	1,1-Dichloroethane	56	U	
540-59-0-----	1,2-Dichloroethene (total)	56	U	
67-66-3-----	Chloroform	56	U	
107-06-2-----	1,2-Dichloroethane	56	U	
78-93-3-----	2-Butanone	56	U	
71-55-6-----	1,1,1-Trichloroethane	56	U	
56-23-5-----	Carbon Tetrachloride	56	U	
75-27-4-----	Bromodichloromethane	56	U	
78-87-5-----	1,2-Dichloropropane	56	U	
10061-01-5-----	cis-1,3-Dichloropropene	56	U	
79-01-6-----	Trichloroethene	56	U	
124-48-1-----	Dibromochloromethane	56	U	
79-00-5-----	1,1,2-Trichloroethane	56	U	
71-43-2-----	Benzene	56	U	210T Repor Origin ↓
10061-02-6-----	trans-1,3-Dichloropropene	56	U	
75-25-2-----	Bromoform	56	U	
108-10-1-----	4-Methyl-2-Pentanone	56	U	
591-78-6-----	2-Hexanone	56	U	
127-18-4-----	Tetrachloroethene	210	D	
79-34-5-----	1,1,2,2-Tetrachloroethane	56	U	
108-88-3-----	Toluene	56	U	
108-90-7-----	Chlorobenzene	56	U	Repor Origin ↓
100-41-4-----	Ethylbenzene	56	U	
100-42-5-----	Styrene	56	U	
1330-20-7-----	Xylene (total)	56	U	

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS28DL

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5451

Sample wt/vol: 1.0 (g/mL) G Lab File ID: AE5451D

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 10 Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS29

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5452

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5452

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 15 Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>	Q	✓
74-87-3	Chloromethane	12	U	12u
74-83-9	Bromomethane	12	U	12u
75-01-4	Vinyl Chloride	12	U	↓
75-00-3	Chloroethane	12	U	12u
75-09-2	Methylene Chloride	5	BJ	26u
67-64-1	Acetone	26	B	12u
75-15-0	Carbon Disulfide	12	U	↓
75-35-4	1,1-Dichloroethene	12	U	12u
75-34-3	1,1-Dichloroethane	12	U	↓
540-59-0	1,2-Dichloroethene (total)	12	U	12u
67-66-3	Chloroform	12	U	↓
107-06-2	1,2-Dichloroethane	12	U	12u
78-93-3	2-Butanone	6	BJ	12u
71-55-6	1,1,1-Trichloroethane	12	U	12u
56-23-5	Carbon Tetrachloride	12	U	↓
75-27-4	Bromodichloromethane	12	U	12u
78-87-5	1,2-Dichloropropane	12	U	↓
10061-01-5	cis-1,3-Dichloropropene	12	U	12u
79-01-6	Trichloroethene	12	U	↓
124-48-1	Dibromochloromethane	12	U	12u
79-00-5	1,1,2-Trichloroethane	12	U	↓
71-43-2	Benzene	12	U	12u
10061-02-6	trans-1,3-Dichloropropene	12	U	↓
75-25-2	Bromoform	12	U	12u
108-10-1	4-Methyl-2-Pentanone	12	U	↓
591-78-6	2-Hexanone	12	U	12u
127-18-4	Tetrachloroethene	610	E	Report
79-34-5	1,1,2,2-Tetrachloroethane	12	U	12u
108-88-3	Toluene	4	J	4J
108-90-7	Chlorobenzene	12	U	12u
100-41-4	Ethylbenzene	12	U	↓
100-42-5	Styrene	12	U	12u
1330-20-7	Xylene (total)	12	U	↓

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS29

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5452

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5452

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 15 Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0 CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS29DL

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5452

Sample wt/vol: 1.0 (g/mL) G Lab File ID: AE5452D2

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 15 Date Analyzed: 03/19/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND			
74-87-3	Chloromethane	59	U	Report Original
74-83-9	Bromomethane	59	U	
75-01-4	Vinyl Chloride	59	U	
75-00-3	Chloroethane	59	U	
75-09-2	Methylene Chloride	59	U	
67-64-1	Acetone	43	BDJ	
75-15-0	Carbon Disulfide	59	U	
75-35-4	1,1-Dichloroethene	59	U	
75-34-3	1,1-Dichloroethane	59	U	
540-59-0	1,2-Dichloroethene (total)	59	U	
67-66-3	Chloroform	59	U	
107-06-2	1,2-Dichloroethane	59	U	
78-93-3	2-Butanone	8	DJ	
71-55-6	1,1,1-Trichloroethane	59	U	
56-23-5	Carbon Tetrachloride	59	U	
75-27-4	Bromodichloromethane	59	U	
78-87-5	1,2-Dichloropropane	59	U	
10061-01-5	cis-1,3-Dichloropropene	59	U	
79-01-6	Trichloroethene	59	U	
124-48-1	Dibromochloromethane	59	U	
79-00-5	1,1,2-Trichloroethane	59	U	
71-43-2	Benzene	59	U	
10061-02-6	trans-1,3-Dichloropropene	59	U	
75-25-2	Bromoform	59	U	
108-10-1	4-Methyl-2-Pentanone	59	U	
591-78-6	2-Hexanone	59	U	
127-18-4	Tetrachloroethene	150	D	
79-34-5	1,1,2,2-Tetrachloroethane	59	U	
108-88-3	Toluene	59	U	
108-90-7	Chlorobenzene	59	U	
100-41-4	Ethylbenzene	59	U	
100-42-5	Styrene	59	U	
1330-20-7	Xylene (total)	59	U	Report Original

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS29DL

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5452

Sample wt/vol: 1.0 (g/mL) G Lab File ID: AE5452D2

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 15 Date Analyzed: 03/19/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS30

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3067

SAS No.: _____

SDG No.: DCW

Matrix: (soil/water) SOIL

Lab Sample ID: AE5453

Sample wt/vol: 1.0 (g/mL) G

Lab File ID: AE5453D

Level: (low/med) LOW

Date Received: 03/13/95

% Moisture: not dec. 13

Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

Q

74-87-3-----	Chloromethane	57	U	57u
74-83-9-----	Bromomethane	57	U	
75-01-4-----	Vinyl Chloride	57	U	
75-00-3-----	Chloroethane	57	U	
75-09-2-----	Methylene Chloride	14	BJ	57u
67-64-1-----	Acetone	17	BJ	57u
75-15-0-----	Carbon Disulfide	57	U	57u
75-35-4-----	1,1-Dichloroethene	57	U	
75-34-3-----	1,1-Dichloroethane	57	U	
540-59-0-----	1,2-Dichloroethene (total)	57	U	
67-66-3-----	Chloroform	57	U	
107-06-2-----	1,2-Dichloroethane	57	U	
78-93-3-----	2-Butanone	57	U	
71-55-6-----	1,1,1-Trichloroethane	57	U	
56-23-5-----	Carbon Tetrachloride	57	U	
75-27-4-----	Bromodichloromethane	57	U	
78-87-5-----	1,2-Dichloropropane	57	U	
10061-01-5-----	cis-1,3-Dichloropropene	57	U	
79-01-6-----	Trichloroethene	57	U	
124-48-1-----	Dibromochloromethane	57	U	
79-00-5-----	1,1,2-Trichloroethane	8	J	8J
71-43-2-----	Benzene	57	U	57u
10061-02-6-----	trans-1,3-Dichloropropene	57	U	
75-25-2-----	Bromoform	57	U	
108-10-1-----	4-Methyl-2-Pentanone	57	U	
591-78-6-----	2-Hexanone	57	U	
127-18-4-----	Tetrachloroethene	1100		1100
79-34-5-----	1,1,2,2-Tetrachloroethane	57	U	57u
108-88-3-----	Toluene	57	U	
108-90-7-----	Chlorobenzene	57	U	
100-41-4-----	Ethylbenzene	57	U	
100-42-5-----	Styrene	57	U	
1330-20-7-----	Xylene (total)	57	U	

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS30

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5453

Sample wt/vol: 1.0 (g/mL) G Lab File ID: AE5453D

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 13 Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS31

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3067

SAS No.: _____

SDG No.: DCW

Matrix: (soil/water) SOIL

Lab Sample ID: AE5454

Sample wt/vol: 5.0 (g/mL) G

Lab File ID: AE5454

Level: (low/med) LOW

Date Received: 03/13/95

% Moisture: not dec. 18

Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND			
74-87-3	Chloromethane	12	U	12uJ
74-83-9	Bromomethane	12	U	12u
75-01-4	Vinyl Chloride	12	U	↓
75-00-3	Chloroethane	12	U	12u
75-09-2	Methylene Chloride	5	BJ	19uJ
67-64-1	Acetone	19	B	12u
75-15-0	Carbon Disulfide	12	U	↓
75-35-4	1,1-Dichloroethene	12	U	12uJ
75-34-3	1,1-Dichloroethane	12	U	12u
540-59-0	1,2-Dichloroethene (total)	12	U	↓
67-66-3	Chloroform	12	U	12uJ
107-06-2	1,2-Dichloroethane	12	U	12u
78-93-3	2-Butanone	12	U	↓
71-55-6	1,1,1-Trichloroethane	12	U	12uJ
56-23-5	Carbon Tetrachloride	12	U	12u
75-27-4	Bromodichloromethane	12	U	↓
78-87-5	1,2-Dichloropropane	12	U	12uJ
10061-01-5	cis-1,3-Dichloropropene	12	U	12u
79-01-6	Trichloroethene	3	J	↓
124-48-1	Dibromochloromethane	12	U	12uJ
79-00-5	1,1,2-Trichloroethane	12	U	12u
71-43-2	Benzene	12	U	↓
10061-02-6	trans-1,3-Dichloropropene	12	U	12uJ
75-25-2	Bromoform	12	U	12u
108-10-1	4-Methyl-2-Pentanone	12	U	↓
591-78-6	2-Hexanone	12	U	12uJ
127-18-4	Tetrachloroethene	1300	E	Report
79-34-5	1,1,2,2-Tetrachloroethane	12	U	12u
108-88-3	Toluene	2	J	2J
108-90-7	Chlorobenzene	12	U	12u
100-41-4	Ethylbenzene	12	U	↓
100-42-5	Styrene	12	U	12uJ
1330-20-7	Xylene (total)	12	U	↓

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TUT 007 1792

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS31

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5454

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5454

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 18 Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS31DL

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5454

Sample wt/vol: 1.0 (g/mL) G Lab File ID: AE5454D2

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 18 Date Analyzed: 03/19/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND			
74-87-3	Chloromethane	61	U	Report Original ↓
74-83-9	Bromomethane	61	U	
75-01-4	Vinyl Chloride	61	U	
75-00-3	Chloroethane	61	U	
75-09-2	Methylene Chloride	61	U	
67-64-1	Acetone	28	BDJ	
75-15-0	Carbon Disulfide	61	U	
75-35-4	1,1-Dichloroethene	61	U	
75-34-3	1,1-Dichloroethane	61	U	
540-59-0	1,2-Dichloroethene (total)	61	U	
67-66-3	Chloroform	61	U	
107-06-2	1,2-Dichloroethane	61	U	
78-93-3	2-Butanone	61	U	
71-55-6	1,1,1-Trichloroethane	61	U	
56-23-5	Carbon Tetrachloride	61	U	
75-27-4	Bromodichloromethane	61	U	
78-87-5	1,2-Dichloropropane	61	U	
10061-01-5	cis-1,3-Dichloropropene	61	U	
79-01-6	Trichloroethene	61	U	
124-48-1	Dibromochloromethane	61	U	
79-00-5	1,1,2-Trichloroethane	61	U	560 Report Original ↓
71-43-2	Benzene	61	U	
10061-02-6	trans-1,3-Dichloropropene	61	U	
75-25-2	Bromoform	61	U	
108-10-1	4-Methyl-2-Pentanone	61	U	
591-78-6	2-Hexanone	61	U	
127-18-4	Tetrachloroethene	560	D	
79-34-5	1,1,2,2-Tetrachloroethane	61	U	
108-88-3	Toluene	61	U	Report Original ↓
108-90-7	Chlorobenzene	61	U	
100-41-4	Ethylbenzene	61	U	
100-42-5	Styrene	61	U	
1330-20-7	Xylene (total)	61	U	

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS31DL

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5454

Sample wt/vol: 1.0 (g/mL) G Lab File ID: AE5454D2

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 18 Date Analyzed: 03/19/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS32

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5455

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5455R

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 12 Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

74-87-3-----	Chloromethane	11	U	11u
74-83-9-----	Bromomethane	11	U	
75-01-4-----	Vinyl Chloride	11	U	
75-00-3-----	Chloroethane	11	U	
75-09-2-----	Methylene Chloride	3	BJ	11u
67-64-1-----	Acetone	5	BJ	11u
75-15-0-----	Carbon Disulfide	11	U	11u
75-35-4-----	1,1-Dichloroethene	11	U	
75-34-3-----	1,1-Dichloroethane	11	U	
540-59-0-----	1,2-Dichloroethene (total)	11	U	
67-66-3-----	Chloroform	11	U	
107-06-2-----	1,2-Dichloroethane	11	U	
78-93-3-----	2-Butanone	11	U	
71-55-6-----	1,1,1-Trichloroethane	11	U	
56-23-5-----	Carbon Tetrachloride	11	U	
75-27-4-----	Bromodichloromethane	11	U	
78-87-5-----	1,2-Dichloropropane	11	U	
10061-01-5-----	cis-1,3-Dichloropropene	11	U	
79-01-6-----	Trichloroethene	11	U	
124-48-1-----	Dibromochloromethane	11	U	
79-00-5-----	1,1,2-Trichloroethane	11	U	
71-43-2-----	Benzene	11	U	
10061-02-6-----	trans-1,3-Dichloropropene	11	U	
75-25-2-----	Bromoform	11	U	
108-10-1-----	4-Methyl-2-Pentanone	11	U	
591-78-6-----	2-Hexanone	11	U	
127-18-4-----	Tetrachloroethene	38		38
79-34-5-----	1,1,2,2-Tetrachloroethane	11	U	11u
108-88-3-----	Toluene	4	J	4J
108-90-7-----	Chlorobenzene	11	U	11u
100-41-4-----	Ethylbenzene	11	U	
100-42-5-----	Styrene	11	U	
1330-20-7-----	Xylene (total)	11	U	

FORM I VOA

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS32

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5455

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5455R

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 12 Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS33

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5456

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5456

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 13 Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

74-87-3-----	Chloromethane	11	U	11u
74-83-9-----	Bromomethane	11	U	11u
75-01-4-----	Vinyl Chloride	11	U	↓
75-00-3-----	Chloroethane	11	U	11u
75-09-2-----	Methylene Chloride	2	BJ	12u
67-64-1-----	Acetone	12	B	12u
75-15-0-----	Carbon Disulfide	11	U	11u
75-35-4-----	1,1-Dichloroethene	11	U	↓
75-34-3-----	1,1-Dichloroethane	11	U	11u
540-59-0-----	1,2-Dichloroethene (total)	11	U	↓
67-66-3-----	Chloroform	11	U	11u
107-06-2-----	1,2-Dichloroethane	11	U	↓
78-93-3-----	2-Butanone	11	U	11u
71-55-6-----	1,1,1-Trichloroethane	11	U	11u
56-23-5-----	Carbon Tetrachloride	11	U	↓
75-27-4-----	Bromodichloromethane	11	U	11u
78-87-5-----	1,2-Dichloropropane	11	U	↓
10061-01-5-----	cis-1,3-Dichloropropene	11	U	11u
79-01-6-----	Trichloroethene	11	U	↓
124-48-1-----	Dibromochloromethane	11	U	11u
79-00-5-----	1,1,2-Trichloroethane	11	U	↓
71-43-2-----	Benzene	2	J	11u
10061-02-6-----	trans-1,3-Dichloropropene	11	U	↓
75-25-2-----	Bromoform	11	U	11u
108-10-1-----	4-Methyl-2-Pentanone	11	U	↓
591-78-6-----	2-Hexanone	11	U	11u
127-18-4-----	Tetrachloroethene	31		31
79-34-5-----	1,1,2,2-Tetrachloroethane	11	U	11u
108-88-3-----	Toluene	1	J	11u
108-90-7-----	Chlorobenzene	11	U	↓
100-41-4-----	Ethylbenzene	11	U	11u
100-42-5-----	Styrene	11	U	↓
1330-20-7-----	Xylene (total)	11	U	11u

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS33

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5456

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5456

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 13 Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS34

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5457

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5457

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 14 Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) <u>UG/KG</u>		Q
74-87-3	Chloromethane	12	U	12u
74-83-9	Bromomethane	12	U	12u
75-01-4	Vinyl Chloride	12	U	↓
75-00-3	Chloroethane	12	U	12u
75-09-2	Methylene Chloride	2	BJ	12u
67-64-1	Acetone	4	BJ	12u
75-15-0	Carbon Disulfide	12	U	12u
75-35-4	1,1-Dichloroethene	12	U	↓
75-34-3	1,1-Dichloroethane	12	U	↓
540-59-0	1,2-Dichloroethene (total)	12	U	↓
67-66-3	Chloroform	12	U	↓
107-06-2	1,2-Dichloroethane	12	U	↓
78-93-3	2-Butanone	12	U	12u
71-55-6	1,1,1-Trichloroethane	12	U	12u
56-23-5	Carbon Tetrachloride	12	U	↓
75-27-4	Bromodichloromethane	12	U	↓
78-87-5	1,2-Dichloropropane	12	U	↓
10061-01-5	cis-1,3-Dichloropropene	12	U	↓
79-01-6	Trichloroethene	12	U	↓
124-48-1	Dibromochloromethane	12	U	↓
79-00-5	1,1,2-Trichloroethane	12	U	↓
71-43-2	Benzene	12	U	↓
10061-02-6	trans-1,3-Dichloropropene	12	U	↓
75-25-2	Bromoform	12	U	↓
108-10-1	4-Methyl-2-Pentanone	12	U	↓
591-78-6	2-Hexanone	12	U	↓
127-18-4	Tetrachloroethene	170	U	170
79-34-5	1,1,2,2-Tetrachloroethane	12	U	12u
108-88-3	Toluene	2	J	2J
108-90-7	Chlorobenzene	12	U	12u
100-41-4	Ethylbenzene	12	U	↓
100-42-5	Styrene	12	U	↓
1330-20-7	Xylene (total)	12	U	↓

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS34

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5457

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5457

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 14 Date Analyzed: 03/17/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

EXS35

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5458

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5458

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 13 Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG Q

CAS NO.	COMPOUND			
74-87-3	Chloromethane	11	U	11u
74-83-9	Bromomethane	11	U	
75-01-4	Vinyl Chloride	11	U	
75-00-3	Chloroethane	11	U	
75-09-2	Methylene Chloride	2	BJ	11u
67-64-1	Acetone	19	B	19u
75-15-0	Carbon Disulfide	11	U	11u
75-35-4	1,1-Dichloroethene	11	U	
75-34-3	1,1-Dichloroethane	11	U	
540-59-0	1,2-Dichloroethene (total)	11	U	
67-66-3	Chloroform	11	U	
107-06-2	1,2-Dichloroethane	11	U	
78-93-3	2-Butanone	11	U	
71-55-6	1,1,1-Trichloroethane	11	U	
56-23-5	Carbon Tetrachloride	11	U	
75-27-4	Bromodichloromethane	11	U	
78-87-5	1,2-Dichloropropane	11	U	
10061-01-5	cis-1,3-Dichloropropene	11	U	
79-01-6	Trichloroethene	11	U	
124-48-1	Dibromochloromethane	11	U	
79-00-5	1,1,2-Trichloroethane	11	U	
71-43-2	Benzene	4	J	4u
10061-02-6	trans-1,3-Dichloropropene	11	U	11u
75-25-2	Bromoform	11	U	
108-10-1	4-Methyl-2-Pentanone	11	U	
591-78-6	2-Hexanone	11	U	
127-18-4	Tetrachloroethene	160		160
79-34-5	1,1,2,2-Tetrachloroethane	11	U	11u
108-88-3	Toluene	10	J	10u
108-90-7	Chlorobenzene	11	U	11u
100-41-4	Ethylbenzene	11	U	
100-42-5	Styrene	11	U	
1330-20-7	Xylene (total)	2	JB	11u

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

EXS35

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) SOIL Lab Sample ID: AE5458

Sample wt/vol: 5.0 (g/mL) G Lab File ID: AE5458

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. 13 Date Analyzed: 03/18/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

FBMAR995

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) WATER Lab Sample ID: AE5462

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AE5462

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. _____ Date Analyzed: 03/21/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

CAS NO. COMPOUND CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L Q

74-87-3-----	Chloromethane	10	U	10u
74-83-9-----	Bromomethane	10	U	↓
75-01-4-----	Vinyl Chloride	10	U	10u
75-00-3-----	Chloroethane	10	U	10u
75-09-2-----	Methylene Chloride	10	U	10u
67-64-1-----	Acetone	4	BJ	10u
75-15-0-----	Carbon Disulfide	10	U	10u
75-35-4-----	1,1-Dichloroethene	10	U	10u
75-34-3-----	1,1-Dichloroethane	10	U	↓
540-59-0-----	1,2-Dichloroethene (total)	10	U	10u
67-66-3-----	Chloroform	10	U	↓
107-06-2-----	1,2-Dichloroethane	1	J	10u
78-93-3-----	2-Butanone	10	U	10u
71-55-6-----	1,1,1-Trichloroethane	10	U	↓
56-23-5-----	Carbon Tetrachloride	10	U	10u
75-27-4-----	Bromodichloromethane	10	U	↓
78-87-5-----	1,2-Dichloropropane	10	U	10u
10061-01-5-----	cis-1,3-Dichloropropene	10	U	↓
79-01-6-----	Trichloroethene	10	U	10u
124-48-1-----	Dibromochloromethane	10	U	↓
79-00-5-----	1,1,2-Trichloroethane	10	U	10u
71-43-2-----	Benzene	10	U	↓
10061-02-6-----	trans-1,3-Dichloropropene	10	U	10u
75-25-2-----	Bromoform	10	U	↓
108-10-1-----	4-Methyl-2-Pentanone	10	U	10u
591-78-6-----	2-Hexanone	10	U	↓
127-18-4-----	Tetrachloroethene	10	U	10u
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U	↓
108-88-3-----	Toluene	10	U	10u
108-90-7-----	Chlorobenzene	10	U	↓
100-41-4-----	Ethylbenzene	10	U	10u
100-42-5-----	Styrene	10	U	↓
1330-20-7-----	Xylene (total)	10	U	10u

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

FBMAR995

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3067

SAS No.: _____

SDG No.: DCW

Matrix: (soil/water) WATER

Lab Sample ID: AE5462

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: AE5462

Level: (low/med) LOW

Date Received: 03/13/95

% Moisture: not dec. _____

Date Analyzed: 03/21/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

TBMAR995

Lab Name: ITAS-KNOXVILLE Contract: LHENRI

Lab Code: ITSTU Case No.: 3067 SAS No.: _____ SDG No.: DCW

Matrix: (soil/water) WATER Lab Sample ID: AE5460

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: AE5460

Level: (low/med) LOW Date Received: 03/13/95

% Moisture: not dec. _____ Date Analyzed: 03/21/95

GC Column: RTX624 ID: 0.530 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
=====	=====	=====	=====	=====

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TBMAR995

Lab Name: ITAS-KNOXVILLE

Contract: LHENRI

Lab Code: ITSTU

Case No.: 3067

SAS No.: _____

SDG No.: DCW

Matrix: (soil/water) WATER

Lab Sample ID: AE5460

Sample wt/vol: 5.0 (g/mL) ML

Lab File ID: AE5460

Level: (low/med) LOW

Date Received: 03/13/95

% Moisture: not dec. _____

Date Analyzed: 03/21/95

GC Column: RTX624 ID: 0.530 (mm)

Dilution Factor: 1.0

Soil Extract Volume: _____ (uL)

Soil Aliquot Volume: _____ (uL)

CONCENTRATION UNITS:

CAS NO.

COMPOUND

(ug/L or ug/Kg) UG/L

Q

74-87-3-----	Chloromethane	10	U	10u
74-83-9-----	Bromomethane	10	U	↓
75-01-4-----	Vinyl Chloride	10	U	10u
75-00-3-----	Chloroethane	10	U	10u
75-09-2-----	Methylene Chloride	1	BJ	10u
67-64-1-----	Acetone	4	BJ	10u
75-15-0-----	Carbon Disulfide	10	U	10u
75-35-4-----	1,1-Dichloroethene	10	U	↓
75-34-3-----	1,1-Dichloroethane	10	U	10u
540-59-0-----	1,2-Dichloroethene (total)	10	U	↓
67-66-3-----	Chloroform	10	U	10u
107-06-2-----	1,2-Dichloroethane	1	J	↓
78-93-3-----	2-Butanone	10	U	10u
71-55-6-----	1,1,1-Trichloroethane	10	U	10u
56-23-5-----	Carbon Tetrachloride	10	U	↓
75-27-4-----	Bromodichloromethane	10	U	10u
78-87-5-----	1,2-Dichloropropane	10	U	↓
10061-01-5-----	cis-1,3-Dichloropropene	10	U	10u
79-01-6-----	Trichloroethene	10	U	↓
124-48-1-----	Dibromochloromethane	10	U	10u
79-00-5-----	1,1,2-Trichloroethane	10	U	↓
71-43-2-----	Benzene	10	U	10u
10061-02-6-----	trans-1,3-Dichloropropene	10	U	↓
75-25-2-----	Bromoform	10	U	10u
108-10-1-----	4-Methyl-2-Pentanone	10	U	↓
591-78-6-----	2-Hexanone	10	U	10u
127-18-4-----	Tetrachloroethene	10	U	↓
79-34-5-----	1,1,2,2-Tetrachloroethane	10	U	10u
108-88-3-----	Toluene	10	U	↓
108-90-7-----	Chlorobenzene	10	U	10u
100-41-4-----	Ethylbenzene	10	U	↓
100-42-5-----	Styrene	10	U	10u
1330-20-7-----	Xylene (total)	10	U	↓

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TUT 007 1807

GEOTECHNICAL TESTING RESULTS



GEOTECHNICAL LABORATORY REPORT FOR L' HENRI

409830.00200000

APRIL 11, 1995

Environmental Technology Development Center
P.O. Box 4339 • 1570 Bear Creek Road • Oak Ridge, Tennessee 37830 • 615-482-6497 • FAX: 615-482-1890

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TUT 007 1809

CERTIFICATE OF ANALYSIS

Belinda Price
IT-Knoxville
312 Directors Drive
Knoxville, TN 37923

April 11, 1995

ETDC Project Number: 409830.00200000 Job Number: 409830.00200000

This is the Certificate of Analysis for the following samples:

Client Project ID: L' Henri
Date Received by Lab: March 10 and March 14, 1995
Number of Samples: Two (2) received, one (1) tested
Sample Type: Soil

I. Introduction/Case Narrative

One soil sample was received by IT/ETDC on March 10, 1995. Requested testing included particle-size analysis, moisture content, permeability, density, porosity and organic content. Additional material was received by IT/ETDC on March 14, 1995 to be used if there was not enough sample quantity to complete testing.

Please see Appendix A, Sample Number Cross Reference List; Appendix B, Analysis Results; Appendix C, Chain of Custody and Request for Analysis Records, and Appendix D, Variance Documents for specific sample information.

Reviewed and Approved:


Beverly L. Leamon
Project Manager, Geotechnical Services

TUT 007 1810

II. Analytical Results/Methodology

REFERENCES: American Society for Testing and Materials (ASTM) Annual Book of ASTM Standards, Section 4, Construction, Volume 4.08, Soil and Rock (I); Volume 4.09, Soil and Rock (II).

Particle-Size Analysis	ASTM D 422
Moisture Content	ASTM D 2216
Permeability	ASTM D 5084
Porosity	EM-1110-2-1906, App. II
Density	EM-1110-2-1906, App. II
Organic Content	ASTM D 2974

III. Quality Control

Quality control checks such as duplicates and spikes (QC samples), are not normally applicable to geotechnical testing. This is due to the inability of obtaining samples with known characteristics, the heterogeneous nature of the samples, and Quality Control procedures built-in to the analytical method.

QC measures to ensure accuracy and precision of test results include the following:

- 100% verification on all numerical results - all raw data entries, transcriptions and calculations entered by lab technicians are checked, recalculated and verified. Most data calculations are performed by computer programs.
- Data validation through test reasonableness - summaries of all test results for individual reports are reviewed to determine the overall reasonableness of data and to determine the presence of any data that may be considered outliers.
- Quality control procedures are built into most standardized geotechnical procedures. For example, many analyses routinely call for a re-analysis, specifying an acceptance criteria.
- Routine instrument calibration - all instruments, gauges and equipment used in testing are calibrated on a routine basis. All instrument calibration follows ASTM or manufacturer guidelines.

- Maintenance of all past calibration records - records and certification documents of all instruments, gauges and equipment are updated routinely and maintained in the Quality Control Coordinators Quality/Operations files.
- Use of trained personnel for conducting tests - all technicians are trained in the application of standard laboratory procedures for geotechnical analyses as well as the quality assurance measures implemented by IT.

IV. Data Qualification

Particle-Size Distribution - Initial hydrometer results do not always coincide with the curve established by fine sieve analysis results and are occasionally omitted. Overlapping results may be caused by organic debris, soluble salts, or other contaminants contained in the sample, or turbidity of the soil/water suspension immediately after manual agitation. Incomplete dispersion of the hydrometer soil portion may, likewise, cause initial hydrometer results to appear far below the curve established by the fine sieve results. Not all soils will be dispersed effectively by the methods defined in ASTM D 422.

Moisture Content - Moisture contents are calculated in accordance with ASTM D 2216. Given results are based on the sample dry weight, not on the sample wet weight as is common in analytical chemistry.

Permeability - Reported results of degree of saturation are based on assumed specific gravity and measured specimen dimensions (EM-1110-2-1906, app. II). For the purposes of initiating permeability testing, saturation is verified by ≥ 0.95 B-coefficient as described in ASTM D 5084. Please also refer to ASTM D 4767, Note 16 for further explanation of the B-parameter and degree of saturation.

Please refer to Appendix D, the Variance Report, for specific information regarding the variance record.

ATTACHMENT I
GEOTECHNICAL TESTING RESULTS

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Belinda Price
IT-Knoxville
April 11, 1995
Client Project ID: L' HENRI
ETDC Project No.: 409830.00200000

IT ENVIRONMENTAL TECHNOLOGY
DEVELOPMENT CENTER
OAK RIDGE, TN
(615) 482-6497

SAMPLE NUMBER CROSS-REFERENCE LIST

ETDC SAMPLE NO.

CLIENT SAMPLE NO.

ETDC-6530 LH01
ETDC-6537 LH02

ATTACHMENT II
GEOTECHNICAL TESTING RESULTS

TUT 007 1815

PARTICLE SIZE ANALYSIS ASTM D 422

Project Name: L' Henri

Client Number: LH01

Project Number: 409830.00200000

ETDC Number: ETDC-6530

Specific Gravity = 2.7765
 Measured

* Moisture Content = 11.8%

SIEVE ANALYSIS

C O A R S E	Sieve No.	Diameter mm	Percent Finer
	3"	75.000	100.0%
	1.5"	37.500	100.0%
	0.75"	19.000	100.0%
	0.375"	9.500	100.0%
	#4	4.750	98.5%
	#10	2.000	96.9%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	87.3%
	#40	0.425	63.0%
	#60	0.250	46.5%
	#100	0.149	36.5%
	#140	0.106	32.3%
	#200	0.075	28.9%

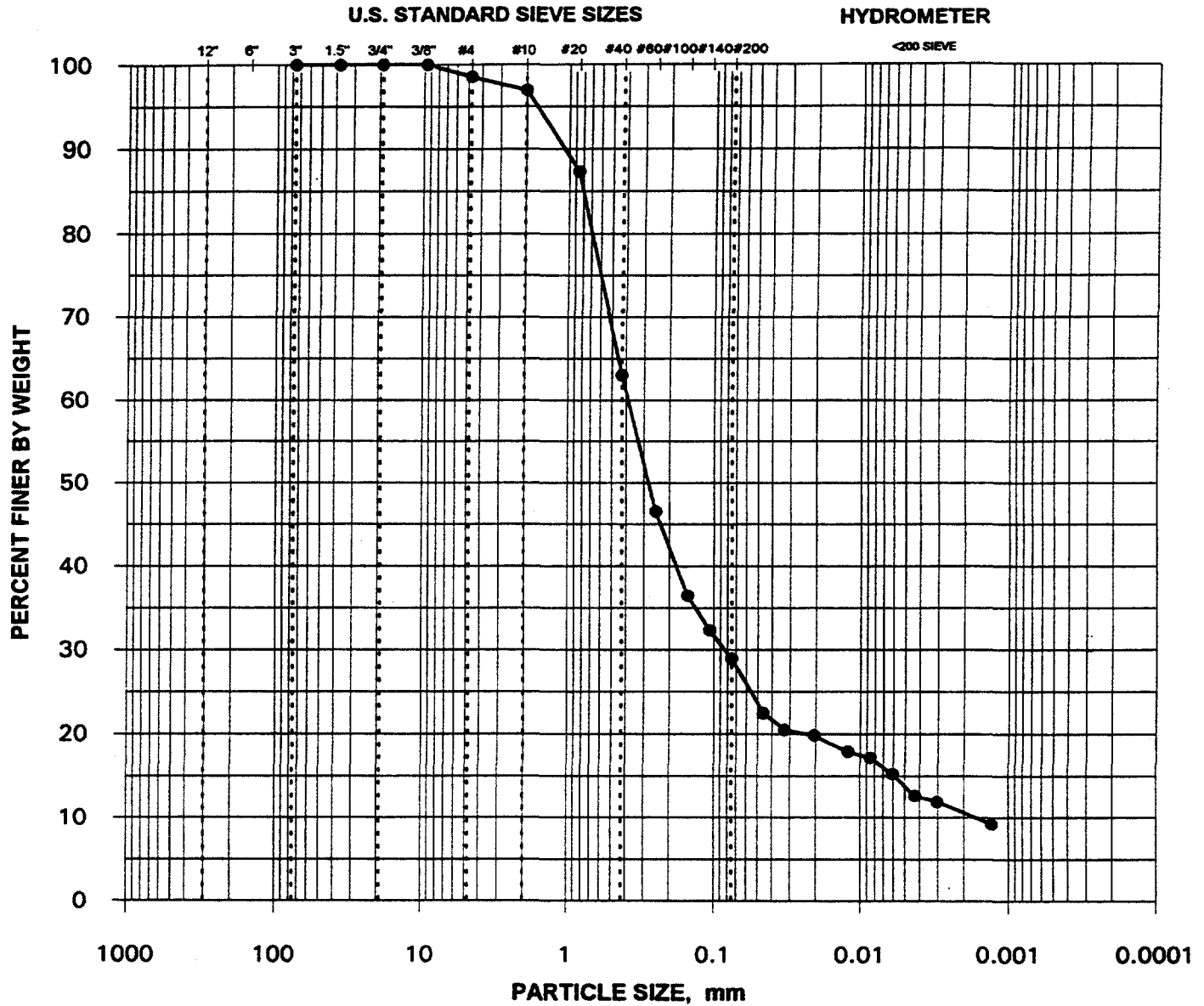
HYDROMETER ANALYSIS

H Y D R O M E T E R	Diameter mm	Percent Finer
	0.04540	22.5%
	0.03248	20.5%
	0.02058	19.8%
	0.01200	17.8%
	0.00850	17.2%
	0.00607	15.2%
	0.00430	12.6%
	0.00301	11.5%
	0.00130	9.3%

*DRY SAMPLE BASIS

TUT 007 1816

L' Henri



CLIENT SAMPLE NO.:

LH01

ETDC SAMPLE NO.: ETDC-6530

BOULDERS	COBBLES	GRAVEL		SAND		
		COARSE	FINE	COARSE	MEDIUM	FINE

SILT 2 - 75 microns
CLAY < 2 microns

PROJECT NUMBER: 409830.00200000

[illegible]

**CONSTANT HEAD PERMEABILITY
ASTM D 5084**

PROJECT NAME: L' Henri
PROJECT NO.: 409830.00200000

CLIENT NO.: LH01
ETDC NO.: ETDC-6530

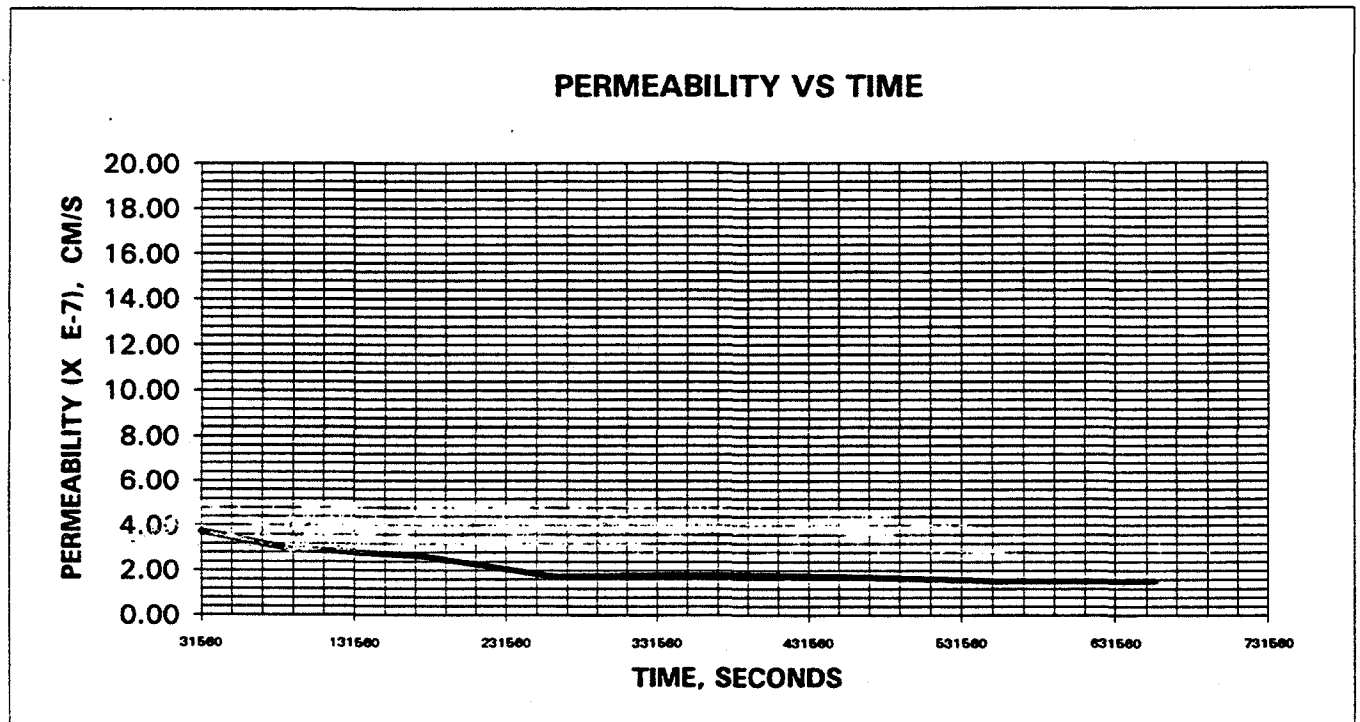
	INITIAL	FINAL
AVG. DIAMETER, CM.:	4.8585	4.8963
AVG LENGTH, CM.:	5.8788	5.7865
AVG. AREA, SQ. CM.:	18.5394	18.8287
WATER CONTENT, %:	11.8	18.8
WET UNIT WEIGHT, PCF:	129.56	129.61
DRY UNIT WEIGHT, PCF:	115.86	109.12
DEG. OF SATURATION, %:	66.2	88.6

SPECIFIC GRAVITY:	2.7765	WET WEIGHT OF SAMPLE, g.:	226.19
SPEC. GRAVITY (A OR M)*:	M	PRESSURE GRADIENT, PSI:	5.0
MAX. CONSOLIDATION STRESS, PSI:	7.0	MIN. CONSOLIDATION STRESS, PSI:	2.0
% VOLUMETRIC STRAIN, +/-:	0.03	TOTAL BACK PRESSURE, PSI:	15.0

PERMEANT FLUID: DEIONIZED, DEAIRED WATER

*ASSUMED OR MEASURED

COEF. OF PERMEABILITY, CM/S: 1.7E-07



PROJECT NUMBER: 409830.00200000

[illegible]

PROJECT NAME: L' Henri PROJECT NUMBER: 409830.00200000

* Assumed or measured (for specific gravity)

ORGANIC & ASH CONTENT ASTM D 2974

PROJECT NAME: L' Henri

PROJECT NUMBER: 409830.00200000

ETDC SAMPLE NUMBER	CLIENT SAMPLE NUMBER	% MOISTURE CONTENT *	% SOLID CONTENT	% ASH (FIXED) RESIDUE	% ORGANIC (VOLATILE) RESIDUE
ETDC-6530	LH01	8.5	91.5	98.5	1.5
ETDC-6530 DUP.	LH01	8.5	91.5	98.7	1.3

*MOISTURE CONTENT RESULTS ARE CALCULATED BASED ON A WET WEIGHT BASIS. GIVEN

WET WEIGHT MOISTURE CONTENT RESULTS ARE CALCULATED THE SAME AS CHEMICAL MOISTURE CONTENT.

ABOVE RESULTS ARE NOT CALCULATED THE SAME AS GEOTECHNICAL MOISTURE (ASTM D 2216).

GEOTECHNICAL MOISTURE CONTENT IS CALCULATED BASED ON A DRY WEIGHT BASIS.

ATTACHMENT III
GEOTECHNICAL TESTING RESULTS

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 1752
Page 1 of 1

Project Name/No. 1. Lewis Soil Remed.
Sample Team Members 2. K. Loy, E. Ward
Profit Center No. 3. 3521210
Project Manager 4. Belinda Price
Purchase Order No. 6.
Required Report Date 11. 3/21/95

Samples Shipment Date 7. 3/7/95
Lab Destination 8. IT-Bear Creek
Lab Contact 9. Beverly Leamon
Project Contact/Phone 12. BP/615/690-3211
Carrier/Waybill No. 13. 40026780880

Bill to: 5. IT Corp. Price
312 Directors Dr.
Knoxville TN 37923
Report to: 10. IT Corporation
312 Directors Drive
Knoxville, TN 37923
Attn: Belinda Price

ONE CONTAINER PER LINE

Sample Number ¹⁴	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Pre-servative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
LH01	Soil 5'-6.5'	3/6/95	Shelby Tube	1.5" x 1.5"	sealed	ASTM D5084-94	Permeability	Did not receive
LH02	Soil 6.5'-8.0'	3/6/95	Glass Jar	160Z	sealed	ASTM D2216-94	Moisture Cont.	
1TSB01-08.0						ASTM D2974-87	Organic Carbon Conc.	
						ETDC 026530		
						EM 1110-2-1906, A2	Bulk Density	
						EM 1110-2-1906, A2	Porosity	
						Grain Size (Sieve)	Hydrometer	
Quantaron to Deliver To						IT Bear Creek		
For Analysis							Received Ambient temp, w/no custody seal - MHO 3/9/95	

Special Instructions: ²³

Possible Hazard Identification: ²⁴

Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: ²⁵

Return to Client ☐ Disposal by Lab ☐ Archive (mos.)

Turnaround Time Required: ²⁶

Normal ☐ Rush ☐

QC Level: ²⁷

I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by ²⁸
(Signature/Affiliation)

Date:
Time:

1. Received by ²⁸
(Signature/Affiliation)

Date: 3/9/95
Time: 0900

2. Relinquished by
(Signature/Affiliation)

Kenny A. Lemm

Date: 3/9/95
Time: 16:45

2. Received by
(Signature/Affiliation)

David D. Flore

Date: 3-10-95
Time: 1035

3. Relinquished by
(Signature/Affiliation)

David D. Flore

Date: 3-10-95
Time: 1145

3. Received by
(Signature/Affiliation)

Bob O'Brien

Date: 3-10-95
Time: 1145

Comments: ²⁹

Note that grain size has been added to project scope.
contact Belinda Price for authorization. Ken Loy 3/7/95

White: To accompany samples

Yellow: Field copy

* See back of form for special instructions

TUT 007 1824

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 2230
Page 1 of 1

Project Name/No. ¹ L'Henri Inc
Sample Team Members ² N/A
Profit Center No. ³ _____
Project Manager ⁴ Becky Charles
Purchase Order No. ⁶ N/A
Required Report Date ¹¹ Normal

Samples Shipment Date ⁷ 3/14/95
Lab Destination ⁸ IT ETDC
Lab Contact ⁹ N/A
Project Contact/Phone ¹² 615-588-6401
Carrier/Waybill No. ¹³ HAND Deliver

Bill to: ⁵ Quanterra ^{3PB} 3/14/95 IT Corp.
Report to: ¹⁰ _____

ONE CONTAINER PER LINE

Sample ¹⁴ Number	Sample ¹⁵ Description/Type	Date/Time ¹⁶ Collected	Container ¹⁷ Type	Sample ¹⁸ Volume	Pre- ¹⁹ servative	Requested Testing ²⁰ Program	Condition on ²¹	Disposal ²² Record No.
<u>ITSB 01-06.5</u>	<u>Soil</u>	<u>3/06/95 1435</u>	<u>Selby Tube</u>	<u>3"x24"</u>	<u>None</u>	<u>Geotech</u> <u>See Previous RFA/cor</u>	<u>ETDC 6537</u>	

Special Instructions: ²³ Sample Not delivered with orig. Shipment

Possible Hazard Identification: ²⁴
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒
Sample Disposal: ²⁵
Return to Client ☐ Disposal by Lab ☒ Archive (mos.)

Turnaround Time Required: ²⁶
Normal ☒ Rush ☐
QC Level: ²⁷
I. ☐ II. ☐ III. ☐ Project Specific (specify):

1. Relinquished by ²⁸ (Signature/Affiliation) <u>Dyan Blomquist QESKN</u>	Date: <u>3/14/95</u> Time: <u>12</u>	1. Received by ²⁸ (Signature/Affiliation) <u>Danica D. Ploz QESKN</u>	Date: <u>3-14-95</u> Time: <u>1200</u>
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation) <u>Paul Char</u>	Date: <u>3-14-95</u> Time: <u>1235</u>
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: ²⁹

ATTACHMENT IV
GEOTECHNICAL TESTING RESULTS

NONCONFORMANCE/VARIANCE REPORT

NONCONFORMANCE or <u>VARIANCE</u> (circle one)	Project Name <u>L. Henri</u> Project No. <u>409830.00200000</u>	Date <u>3-13-95</u>	Page <u>1</u> of <u>1</u> Report No. <u>ETDC-039-95V</u>
---	--	---------------------	---

Nonconformance/Variance Description (include requirement violated)

Did not receive sample on line ¹or ² of CDC #1752 Did receive sample # ITSBO1-08.

Identified by [Signature]

Root Cause

Corrective Action (include expected completion date)

To be completed by

Expected Completion Date

Action taken to preclude recurrence

To be performed by

Expected Completion Date

Client notified (include client name, how notified, and response)

Notified By Belinda Price by phone on 3/15.
See attached memo.

Missing sample was received By ME on 3/14/95. Sent By Quattera middle

Notified by

[Signature]

Date

3-16-95

Corrective action completed by

[Signature]

Date

3-16-95

Corrective action approved by

[Signature]

Laboratory Supervisor

Date

3-16-95

Project Manager

[Signature]

Date

3-16-95

QA Comments

QAO Approval

[Signature]

Date

3-16-95

Use back of page for additional space. Attach additional pages if necessary.

Memorandum

To: Ralph Cole

Date: March 16, 1995

From: Beverly L. Leamon

Subject: **L' Henry: IT-Knoxville**

I spoke to Becky Charles, Quanterra-Middlebrook, concerning sample numbers for L' Henri Project. She stated that client number LH01 (shelby tube) is #ITSB01-06.5 and client number LH02 (jar sample) is #ITSB01-08.0.

I informed Belinda Price, IT Knoxville, about client number confusion and what Becky Charles informed me. Belinda Price stated that both samples were taken from the same location and should be considered as the same sample (each test should be performed once.). The jar sample (LH02) is considered extra material for grain size, moisture content and organic content to be used if we need additional material. She also stated to perform a grain size sieve with hydrometer. Chain-of-Custody states "sieve".

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD *

Reference Document No. 1752
Page 1 of 1

Project Name/No. Lewis Soil Remed. Samples Shipment Date 7 3/7/95
Sample Team Members 2 Kirby, G. Ward Lab Destination 8 IT-Bear Creek
Profit Center No. 3 3521210 Lab Contact 9 Beverly Leamon
Project Manager 4 Belinda Price Project Contact/Phone 12 BP/615/690-3211
Purchase Order No. 6 Carrier/Waybill No. 13 40026780880
Required Report Date 11 3/21/95

Bill to: 5 IT Corp.
Belinda Price
312 Directors Dr.
Knoxville TN 37923
Report to: 10 IT Corporation
312 Directors Drive
Knoxville, TN 37923
Attn: Belinda Price

ONE CONTAINER PER LINE

Sample Number ¹⁴	Sample Description/Type ¹⁵	Date/Time Collected ¹⁶	Container Type ¹⁷	Sample Volume ¹⁸	Pre-servative ¹⁹	Requested Testing Program ²⁰	Condition on Receipt ²¹	Disposal Record No. ²²
LH01	Soil 5'-6.5'	3/6/95	Shelby Tube	1.5" x 1.5"	sealed	ASTM D5084-94	Permeability	Did not receive
LH02	Soil 6.5'-8.0'	3/6/95	Glass Jar	16oz	sealed	ASTM D2216-94	Moisture	
ITSB01-08.0				ETDC 026530		ASTM D2974-87	Organic Carbon Conc.	
						EM 1110-2-1906, AZ	Bulk Density	
						EM 1110-2-1906, AZ	Porosity	
						Grain Size (Sieve)		
Quantaron to Deliver To						IT Bear Creek		
For Analysis							Received Quantaron temp, w/no custody seal - MHO 3/9/95	

Special Instructions: ²³

Possible Hazard Identification: ²⁴

Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐

Sample Disposal: ²⁵

Return to Client ☐ Disposal by Lab ☐ Archive (mos.)

Turnaround Time Required: ²⁶

Normal ☐ Rush ☐

QC Level: ²⁷

I. ☐ II. ☐ III. ☐

Project Specific (specify):

1. Relinquished by ²⁸

(Signature/Affiliation)

Date:

Time:

1. Received by ²⁸

(Signature/Affiliation)

Date: 3/9/95

Time: 0900

2. Relinquished by

(Signature/Affiliation)

Date: 3/9/95

Time: 16:45

2. Received by

(Signature/Affiliation)

Date: 3-10-95

Time: 1035

3. Relinquished by

(Signature/Affiliation)

Date: 3-10-95

Time: 1145

3. Received by

(Signature/Affiliation)

Date: 3-10-95

Time: 1145

Comments: ²⁹

Note that grain size has been added to project scope.



5815 Middlebrook Pike
Knoxville, Tennessee 37921
(615) 588-6401

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD *

Reference Document No. 2230
Page 1 of 1

Project Name/No. ¹ L. Henri Inc
Sample Team Members ² N/A
Profit Center No. ³
Project Manager ⁴ Becky Charles
Purchase Order No. ⁶ N/A
Required Report Date ¹¹ Normal

Samples Shipment Date ⁷ 3/14/95
Lab Destination ⁸ IT EDC
Lab Contact ⁹ N/A
Project Contact/Phone ¹² 615-588-6401
Carrier/Waybill No. ¹³ HAND Deliver

Bill to: ⁵ Quanterra ^{3PB} 3/14/95 IT Corp.

Report to: ¹⁰

ONE CONTAINER PER LINE

Sample ¹⁴ Number	Sample ¹⁵ Description/Type	Date/Time ¹⁶ Collected	Container ¹⁷ Type	Sample ¹⁸ Volume	Pre- ¹⁹ servative	Requested Testing ²⁰ Program	Condition on ²¹	Disposal ²² Record No.
ITSB 01-06.5	Soil	3/06/95 1435	Selby Tube	3"x24"	None	Geotech See Previous RFA/coc	ETDCOK 6537	
							FOR LAB USE ONLY	
							FOR LAB USE ONLY	

Special Instructions: ²³ Sample NOT delivered with orig. Shipment

Possible Hazard Identification: ²⁴

Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☒

Sample Disposal: ²⁵

Return to Client ☐ Disposal by Lab ☒ Archive (mos.)

Turnaround Time Required: ²⁶

Normal ☒ Rush ☐

QC Level: ²⁷

I ☐ II ☐ III ☐ Project Specific (specify)

1. Relinquished by ²⁸
(Signature/Affiliation)

Date: 3/14/95
Time: 12

1. Received by ²⁸
(Signature/Affiliation)

Date: 3-14-95
Time: 1200

2. Relinquished by
(Signature/Affiliation)

Date:
Time:

2. Received by
(Signature/Affiliation)

Date: 3-14-95
Time: 1235

3. Relinquished by
(Signature/Affiliation)

Date:
Time:

3. Received by
(Signature/Affiliation)

Date:
Time:

Comments: ²⁹

Write: 10 accompany samples

Yellow: Held copy

* See back of form for special instructions.

TUT 007 1830

APPENDIX B

PHOTOGRAPHS OF THE EXCAVATION PROCESS AND SOIL VENTING PILE CONSTRUCTION PROCESS

Appendix B

Soil Removal Action

Photograph Number	Description
A. Soil Excavation Activities	
1	Soil excavation activities using a backhoe
2	Progressive excavation of soils
3	Progressive excavation of soils
4	Compacting clean backfill soils in the excavation area
B. Soil Venting Pile Construction	
5	Washed coarse gravel (one-half to 1 inch) was used in the soil pile construction
6	Washed coarse gravel (one-half to 1 inch) was used in the soil pile construction
7	Excavated soils were interlayered with washed coarse gravel
8	Excavated soils were interlayered with washed coarse gravel
9	Corrugated black plastic vent pipes were placed horizontally in the gravel/soil layers
10	A reinforced concrete block wall was built on the four sides of the soil pile
11	A corrugated tin roof was built over the soil pile with roof turbines at the top of the vent pipes for passive soil venting



Photo No. 1 - Soil Excavation Activities Using a Backhoe



Photo No. 2 - Progressive Excavation of Soils



Photo No. 3 - Progressive Excavation of Soils



Photo No. 4 - Compacting Clean Backfill Soils in the Excavation Area



Photo No. 5 - Washed Coarse Gravel (1/2 to 1 inch) Was Used in the Soil Pile Construction

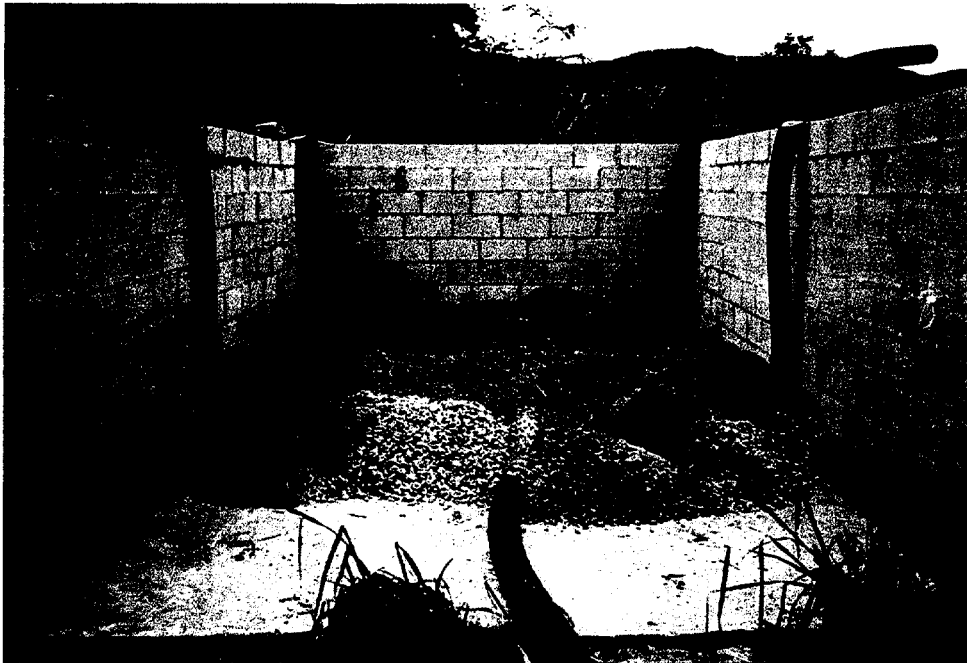


Photo No. 6 - Washed Coarse Gravel (1/2 to 1 inch) Was Used in the Soil Pile Construction



**Photo No. 7 - Excavated Soils Were Interlayered With
Washed Coarse Gravel**



**Photo No. 8 - Excavated Soils Were Interlayered With
Washed Coarse Gravel**

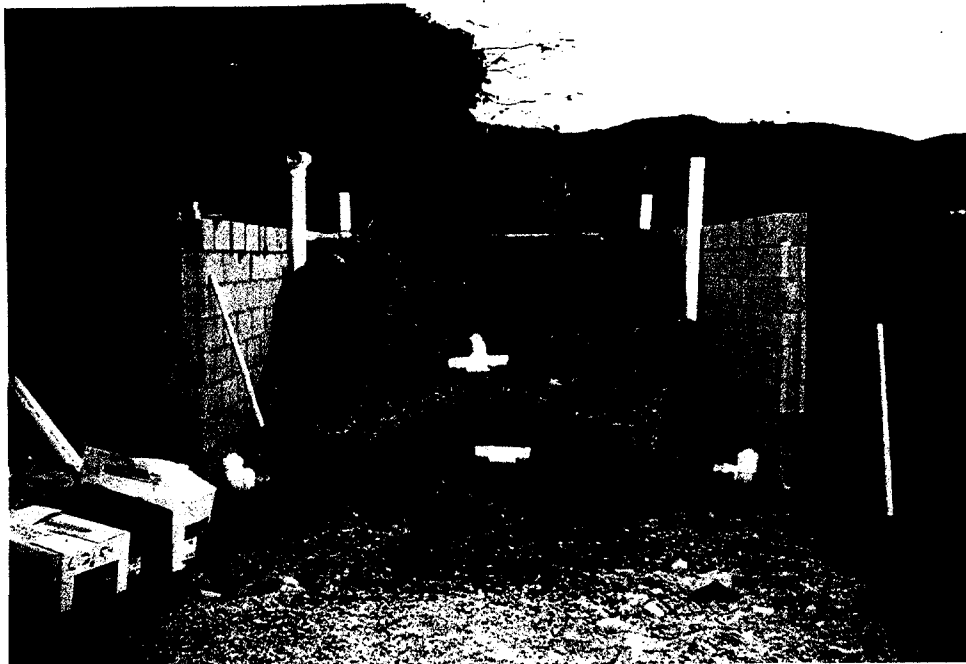


Photo No. 9 - Corrugated Black Plastic Vent Pipes Were Placed Horizontally in the Gravel/Soil Layers



Photo No. 10 - A Reinforced Concrete Block Wall Was Built on the Four Sides of the Soil Pile

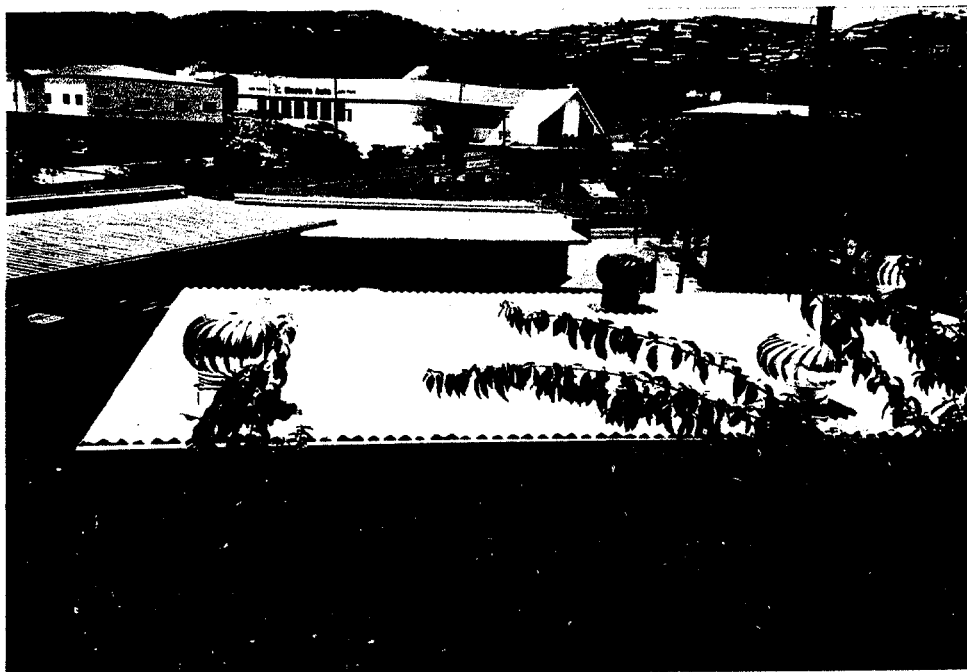


**Photo No. 11 - A Corrugated Iron Roof Was Built Over the Soil
Pile With Roof Turbines at the Top of the Vent
Pipes for Passive Soil Venting**