STID 6529

UNIVERSITY OF CALIFORNIA, BERKELEY

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ENVIRONMENT
HEALTH
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98 APR 28 AM 8:38

OFFICE OF ENVIRONMENT, HEALTH AND SAFETY
UNIVERSITY HALL, 3rd FLOOR

BERKELEY, CALIFORNIA 94720

April 21, 1998

① Ask about location of creek.
Maybe do HP bet. Boring B-2
and creek

Pamela J. Evans
Environmental Health Services
Alameda County Health Care Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

RE: Report of Limited Soil and Groundwater Investigation
Gill Tract, UC Berkeley, Albany, CA
Alameda County Site #6529

References:
1) Chu—Spencer, 9/3/97
2) Spencer—Coleman 9/15/97
3) Spencer—Evans 10/27/97
4) Coleman—Spencer 11/5/97
5) Evans—Spencer 12/4/97
6) Evans—Spencer 12/10/97
7) Spencer—Evans 12/29/97

Dear Ms. Evans:

As follow-up to the two underground storage tanks removed in August 1997 and to the Unauthorized Release Report filed in September of 1997 (Reference 1), we are enclosing a Report of Limited Soil and Groundwater Investigation (attached) from our consultants, Brown and Caldwell. The initial work plan prepared by their registered geologist, Todd A. Miller, was sent to you on December 10, 1997 (Reference 6). Background information on the site can be found in the tank removal report prepared by IT Corporation and submitted to you on November 5, 1997 (Reference 4). Based on the findings of our consultant's investigation, we plan no further action and request closure of the site.

If you need further information, please contact Anna Moore (643-9518) or Karl Hans (643-9574).

Sincerely,

Susan L. Spencer
Director

SLS/AM:tn
Attachments

cc: (without attachments)
Leonard D. Long, Manager—Environmental Services, Brown and Caldwell

Sharon Fleming, Associate Dean for Research, College of Natural Resources
Ron Kiriaze, Associate Director, Utilities & Central Services, Physical Plant-Campus Services
Horace Mitchell, Ph.D., Vice Chancellor—Business and Administrative Services
Gordon Rausser, Dean, College of Natural Resources

(with attachments)
Barbara Rotz, Department Safety Coordinator, Gill Tract/Oxford Tract

Karl Hans, Manager—Air and Water Programs, EH&S
Anna Moore, EH&S

BROWN AND CALDWELL

March 20, 1998

Ms. Hari Krashna
Project Manager
University of California, Berkeley
Planning, Design, and Construction
2000 Carleton Street
Berkeley, California 94720-1380

11-6434-01

Subject: Report of Limited Soil and Groundwater Investigation
Gill Tract Research Facility, Albany, California

Dear Ms. Krashna:

This letter report discusses the limited subsurface soil and shallow groundwater investigation conducted at University of California at Berkeley's (UCB's) Gill Tract Facility, located at the intersection of San Pablo Avenue and Marin Avenue in Albany, California (Site). The following describes the field procedures used and samples collected, discusses analytical laboratory results, and presents our conclusions and recommendation for future investigations at the Site. The work conducted during this limited investigation followed Brown and Caldwell's December 3, 1997 (revised December 9, 1997) proposal and UCB's February 16, 1998 Purchase Order No. PPS081394. Work was completed following the terms and conditions stipulated in the above two documents.

Background

International Technology Corporation removed and disposed of two 500-gallon underground storage tanks (USTs) from the Site in August and September 1997. Their report, dated October 1997, noted detectable concentrations of petroleum hydrocarbon compounds in the subsurface soil and shallow groundwater in the immediate vicinity of the two USTs. Alameda County Health Care Agency (County) in their letter dated October 27, 1997 required that a "soil and water investigation" be conducted to "define the extent and severity of the release". On December 15, 1997 UCB transmitted a Work Plan for conducting the limited subsurface investigation to the County. The Work Plan was approved by the County in their letter dated December 29, 1997.

Limited Subsurface Soil and Shallow Groundwater Investigation

The object of this limited investigation was to further define the "extent and severity" of the petroleum hydrocarbons release by collecting *in situ* soil and shallow groundwater samples in the immediate vicinity of the former UST locations.

***In situ* soil sampling**. Three soil borings (see attached site sketch for locations) were advanced by Kvilhaug Well Drilling and Pump Company, Inc., a California-licensed water well driller, using a direct push sampling system. Direct push drilling was selected over conventional techniques because it is quicker than conventional drilling techniques and minimizes the waste material generated during the investigation. The direct push sampling system utilized 4-foot-long by 2-inch-diameter steel coring rods lined with clear isobutylene (or similar material) tubes. Soil cores were collected by pushing the drilling rods to depth, removing them from the borehole, and removing the isobutylene tubes from the rods. New tubes were inserted into the rods and coring resumed. These procedures were continued until the total depth of the boring was reached. Prior to coring, identifiable utility lines were marked and each sampling location was cleared by a private utility locator. In addition, the upper three to five feet or each boring was hand-augered to check for the presence underground utilities.

Boreholes B-1 and B-2 were continuously cored to 12 feet below ground surface (bgs) at the locations identified in the work plan and on Figure 1, attached. Several attempts were made to drill Borehole B-3; however, at each location, hot, loose sand (backfill material from a nearby underground steam line) was encountered near the surface. The boring was relocated several times before a minimum amount (less than 2-feet) of this material was encountered immediately beneath the asphalt. Each attempted location, and the final location of B-3, are identified on Figure 1. Borehole B-3 was cored to 8-feet below ground surface. Below that depth flowing sands were encountered and the boring collapse each time the coring rods were removed from the hole. Therefore additional coring was not possible.

Soil cores were classified according to the Unified Soil Classification System. In addition to evaluating the borehole lithology, the tubes were cut into 1-foot sections and the ends of each section screened for the presence of petroleum hydrocarbons with a photoionization detector (PID). The lithology and PID reading were recorded on the borehole log next to the depth interval from which the data were obtained. Soil samples for laboratory analysis were collected at 3.5-4 feet bgs and 7.5-8 feet bgs in boreholes B-1 and B-2, and from 4-4.5 feet bgs and 7.5-8 feet bgs in B-3. The samples were obtained by cutting the soil core at the appropriate depth, covering the ends of the sample with Teflon sheeting, sealing the ends with plastic caps and tape to provide an airtight seal. The samples were then labeled with the borehole identification number, the depth of the sample, the sampler's initials, and the date collected, and placed into a resealable plastic bag and stored in a cooler containing crushed ice until being deliver to the analytical laboratory.

***In Situ* groundwater sampling**. *In situ* groundwater samples were collected from borings B-1 and B-2 by placing a temporary 1-inch-diameter, slotted and blank, polyvinyl chloride (PVC) casing into the borings. Because borehole B-3 would not remain open, a 3-foot long well screen was driven to 12-feet bgs and connected to temporary PVC casing to collect a representative sample. For each borehole, groundwater was allowed to fill the temporary casing and come to equilibrium with the atmosphere. Then, using a 3/8-inch-diameter stainless steel bailer, a groundwater sample was collected from inside the casing.

Prior to collecting the groundwater sample, the temporary casing was purged by removing three bailer volumes of water. A representative groundwater sample was then collected with the bailer and transferred to the appropriate sampling containers. Samples collected for analysis of volatile compounds were visually inspected to ensure that no air bubbles remained within the sealed bottles. Sample containers were labeled with the borehole identification number, samplers initials, and date of collection, placed in a re-sealable plastic bag and stored in a cooler containing crushed iced until being delivered the analytical laboratory.

Following collection of the shallow groundwater samples, the temporary casings were removed and each boring was backfilled, from bottom to top, with neat cement.

Laboratory Analyses

Samples were submitted to West Analytical Labs, Inc. (WEST) in Davis, California for analysis of total petroleum hydrocarbons as gasoline (TPHg) and diesel fuel (TPHd) following EPA Method 8015 Modified, and benzene, toluene, ethylbenzene, and total xylenes (BTEX) and methyl tertiary-butyl ether (MTBE) following EPA Method 8020.

Results

Soil boring logs are included as Attachment A. Soils encountered during drilling included a dark gray clay underlain by a light gray clayey gravel and a yellow-orange sandy clay. In the area around borehole B-3, loose sand backfill material was encountered near the surface to a maximum depth of 5 feet bgs (at some locations). In addition, flowing sands were encountered in B-3 at a depth below 8 feet bgs. PID readings and the field geologists notes indicated soil occasionally had a slight gasoline and sometimes 'reductive' bay mud odor; however, strong petroleum odors and/or observations of significant petroleum contamination were not noted.

Analytical laboratory results are summarized in Table 1 and illustrated on Figures 2 and 3. Signed laboratory data sheets are included as Attachment B to this report. Laboratory results did not identify petroleum hydrocarbon compounds in the soil samples collected during this limited investigation. TPHg and MTBE were both identified in the grab groundwater sample collected from boring B-2 at a concentration of 100 µg/L. The laboratory indicated, through verbal discussions, that the reported TPHg concentration consisted mostly of MTBE. TPHd, TPHg, BTEX, and MTBE were all reported to be below analytical method reporting limits in the samples collected from Borings B-1 and B-3.

Discussion

MTBE and TPHg were identified in the groundwater sample collected from boring B-2 at very low concentrations. The concentrations and distribution of the constituents identified during this and previous investigations indicate that the subsurface soil and shallow groundwater impacts

are very low. Therefore, Brown and Caldwell recommends that no further investigations be required and a risk based corrective action (RBCA) closure approach be initiated.

Investigation-Derived Wastes

Soil cuttings generated during the drilling procedure were placed in 5-gallon plastic bucket and stored on-site. Purged groundwater and wash water was stored on-site in 55-gallon drums. All wastes generated during this investigation are the responsibility of UCB.

Limitations

This report has been prepared by the staff of Brown and Caldwell under the professional supervision of the registered geologist whose signature appears below. Services provided as part of this investigation are consistent with our agreement with our client. The findings, recommendations, specifications, and professional opinions presented herein have been prepared within the limits prescribed by the client, after being prepared in accordance with generally accepted professional engineering and geologic principles and practices, and appropriate and pertinent county regulations.

This report is solely for the use and information of our client and the regulatory reviewers of the project unless otherwise noted. Opinions and recommendations contained in this report apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report. Any reliance on this report by a third party is at such party's sole risk.

Respectfully Submitted,

BROWN AND CALDWELL

Todd Miller
California Registered Geologist No. 6328

TM:paa
Attachments(2)

cc: Karl Hans, Office Of Environmental Health and Safety,
University of California at Berkeley

Table 1. Summary of Analytical Laboratory Results for *In Situ* Soil and Groundwater Samples Collected at UCB's Gill Tract Facility Albany, California

	Soil Boring	Sample Depth[a]	Date	TPHd[1]	TPH-G[2]	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE[3]
Soil Sample Results					Concentration, mg/kg					
IT Corporation	Diesel Floor (8.5 feet)		8/15/97	<1.0	<1.0	<0.05	<0.05	<0.05	<0.05	<0.05
	Gasoline Floor (9 feet)		8/15/97	NA[4]	900	3 0	<0.05	6.2	17	<17
	Gasoline Floor - SW (10 feet)		8/15/97	NA	300	0.44	0.63	1.7	1.9	NA
	Gasoline Floor - NE (10 feet)		8/15/97	NA	1.0	0.047	0.017	0.006	0.022	NA
Brown and Caldwell	B-1	3.5 - 4.0	2/17/98	<5.0[b]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
		7.5 - 8.0	2/17/98	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
	B-2	3.5 - 4.0	2/17/98	<2.0[c]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
		7.5 - 8.0	2/17/98	<2.0[b]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
	B-3	4.0 - 4.5	2/17/98	<6.0[b]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
		7.5 - 8.0	2/17/98	<2.0[d]	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.050
Groundwater Sample Results					Concentration, µg/L					
IT Corporation	Excavation Water		8/20/97	760	7400	1,200	260	130	370	NA
Brown and Caldwell	B-1		2/17/98	<50	<50	<0 50	<0.50	<0.50	<0.50	<5.0
	B-2		2/17/98	<50	100[e]	<0.50	<0.50	<0.50	<0.50	100
	B-3		2/17/98	<50	<50	<0.50	<0.50	<0.50	<0.50	<5.0

[a]Feet below ground surface
[b]Increased reporting limit due to interference from high boiling point compounds (possible organic matter in soil)
[c]Increased reporting limit due to gasoline range interference (possibly organic matter in soil sample)
[d]Increased reporting limit due to interference from non-diesel organics (organic matter in clayey soil).
[e]Laboratory indicates primary constituent is MTBE.

[1]Total petroleum hydrocarbons as diesel fuel
[2]Total petroleum hydrocarbons as gasoline
[3]Methyl tertiary-butyl ether
[4]Not Analyzed

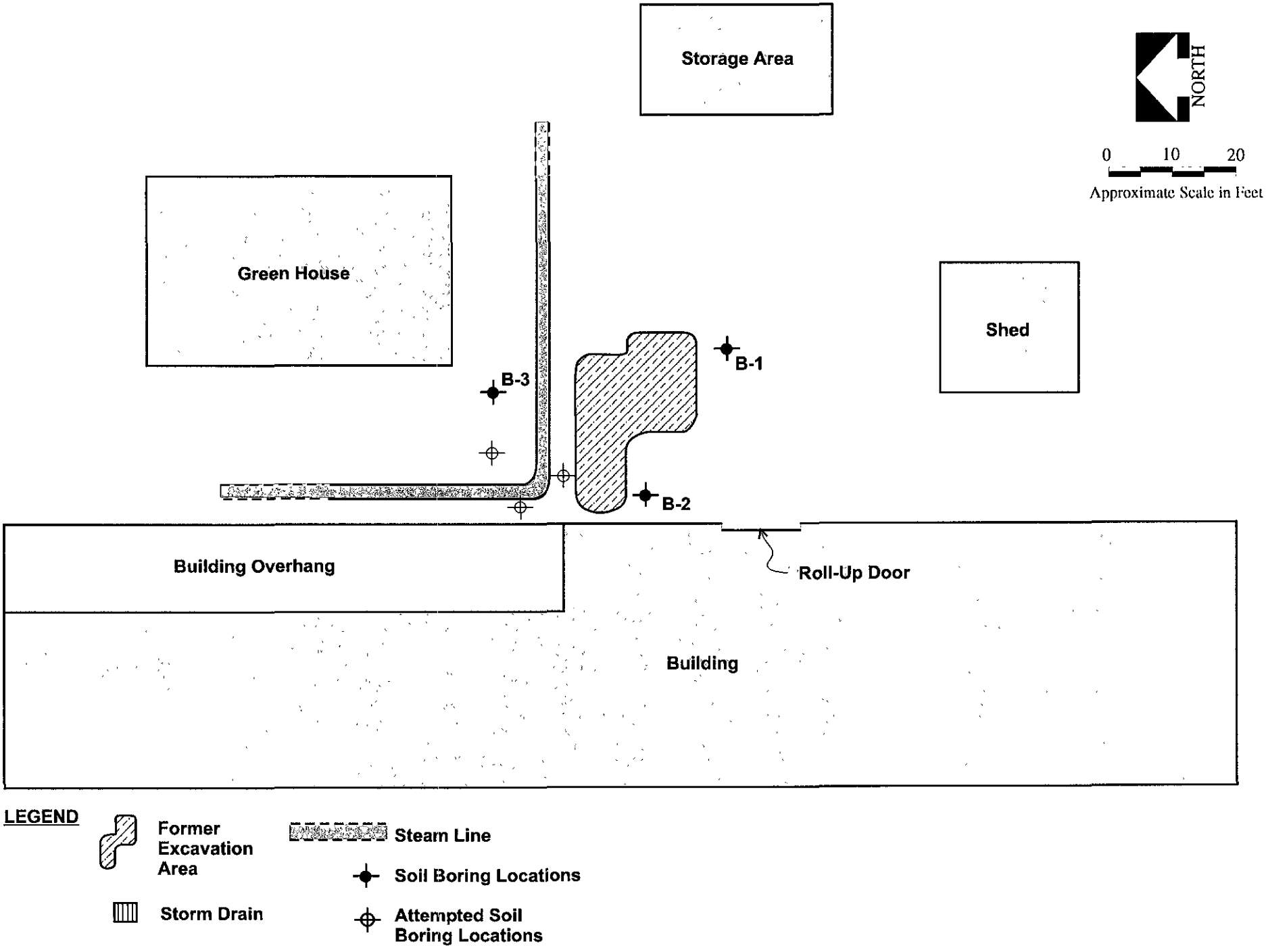
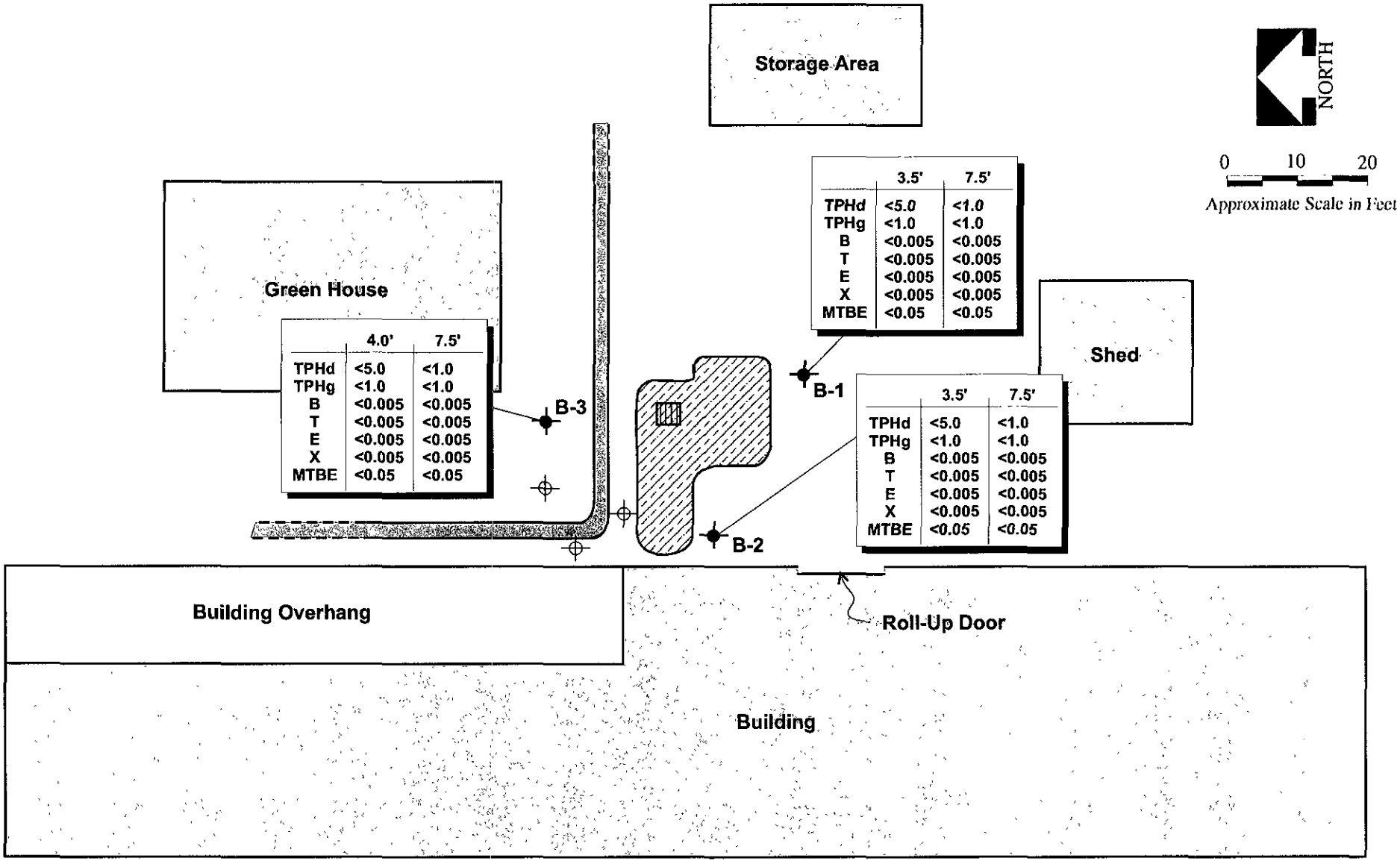


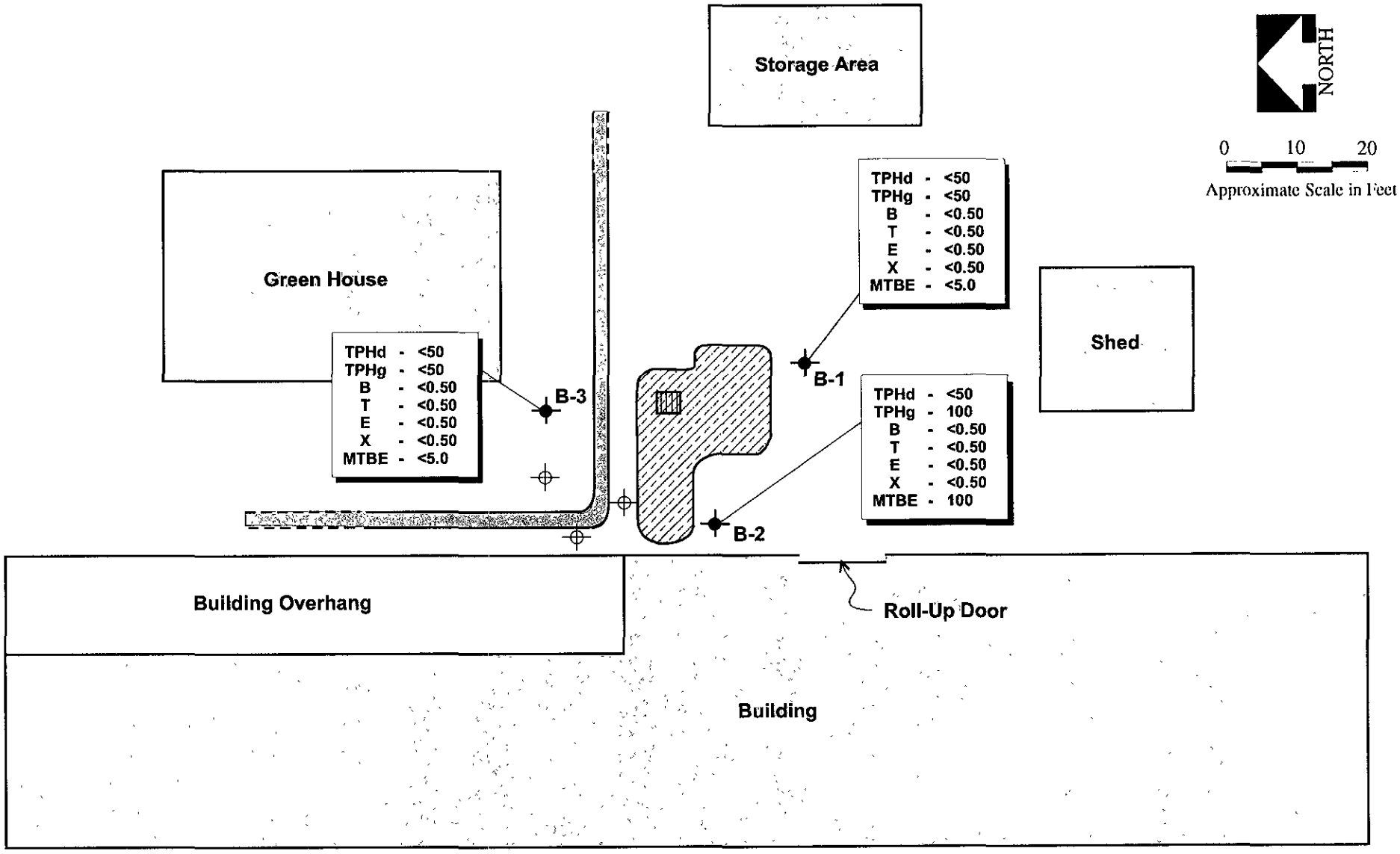
Figure 1 Site Map
UC Berkeley-Gill Tract Facility Albany, CA

6434_01



6434_01

Figure 2 Analytical Results for Soil Samples Collected on February 17, 1998
UC Berkeley-Gill Tract Facility Albany, CA



LEGEND

- Former Excavation Area
- Steam Line
- Storm Drain
- Soil Boring Locations
- Attempted Soil Boring Locations

TPHd	Total Petroleum Hydrocarbons as Diesel Fuel, ug/L
TPHg	Total Petroleum Hydrocarbons as Gasoline, ug/L
B	Benzene, ug/L
T	Toluene, ug/L
E	Ethylbenzene, ug/L
X	Xylene Isomers, ug/L
MTBE	Methyl Tert-Butyl Ether, ug/L

Figure 3 Analytical Results for Groundwater Samples Collected on February 17, 1998
UC Berkeley-Gill Tract Facility Albany, CA

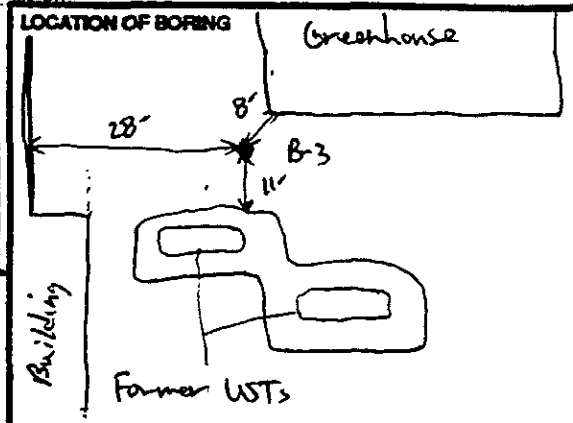
6434_01

EXHIBIT A

BROWN AND CALDWELL SOIL BORING LOGS

Brown and Caldwell Consultants

BOREHOLE/WELL LO



CLIENT: UC Berkeley
LOCATION: Gill Tract, Albany
JOB NO.: 6434-01
BORING NO.: B-3
SHEET: 1 OF 1

	AT TIME OF DRILLING	SECOND	THIRD	FOURTH
WATER LEVEL	—			
TIME	—			
DATE	—			

DRILLING: START TIME 12:50, DATE 2/17/99; FINISH TIME 13:30, DATE 2/17/99
WELL CONSTR.: START TIME, DATE; FINISH TIME, DATE

DRILLING CONTRACTOR: Kuilhang
RIG TYPE: Geoprobe
DRILLING METHOD, FLUID USED: Direct Push
SOIL SAMPLING METHOD: Continuous Core
SURFACE ELEV.:
MONITORING INSTRUMENT: PID
SURFACE CONDITIONS: Asphalt

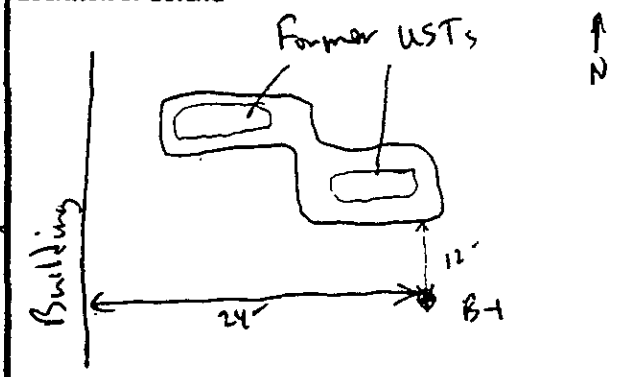
DRILLER: George
DATE:
CHECKED BY:
DATE: 2/17/99
LOGGED BY: J. Lydante

WELL CONSTRUCTION: CASING	WELL CONSTRUCTION: ANNULUS	SOIL SAMPLING: SAMPLER TYPE	SOIL SAMPLING: BLOWS/6" INTERVAL	SOIL SAMPLING: INTERVAL SAMPLED / RECOVERY / ANALYTICAL SAMPLE	DEPTH IN FEET	INSTRUMENT READING (ppm)	ESTIMATED PERCENT: GRAVEL	ESTIMATED PERCENT: SAND	ESTIMATED PERCENT: FINES	MUNSELL COLOR NO.	USCS GROUP SYMBOL	DESCRIPTION: Group Name, Moisture, Color, Consistency, Density, Other
					0							Asphalt 1"
					1							Gravel fill
											SW	Sand, moist, clean, no odor — Fill
					2					▽		Wet Sands
					3						CL	Clay, moist, dark grey, medium stiff, no od
				X	4							
					5	Ø						
					6							
					7	Ø						
				X	8							
					9						?	Flowing sands make it impossible to sample B-12' bgs. Drove a probe to 12' bgs, expose 4 feet of screen (8-12' bgs).
					10							
					11							
					12							
					13							Total Depth 12'
					14							Collect sample @ 14:00 through exposed screen (TPHg/BTEX/MTBE/TVOC). (Slow producer)
					15							
					16							
					17							
					18							
					19							
					20							

Brown and Caldwell
Consultants

BOREHOLE/WELL LO

LOCATION OF BORING



CLIENT	UC Berkeley
LOCATION	Gill Tract, Albany
JOB NO.	6434-01
BORING NO.	B-1
SHEET	1 OF 1

	AT TIME OF DRILLING	SECOND	THIRD	FOURTH
WATER LEVEL	10.2'	8.4	8.1'	
TIME	09:30	10:00	12:00	
DATE	2/17/98	2/17/98	2/17/98	

DRILLING	START	FINISH
TIME	09:10	10:00
DATE	2/17/98	2/17/98

WELL CONSTR.	START	FINISH
TIME		
DATE		

DRILLING CONTRACTOR: Cascade
RIG TYPE: Geoprobe
DRILLING METHOD, FLUID USED: Direct Push
SOIL SAMPLING METHOD: Continuous Core
SURFACE ELEV.:
MONITORING INSTRUMENT: PID
SURFACE CONDITIONS: Asphalt

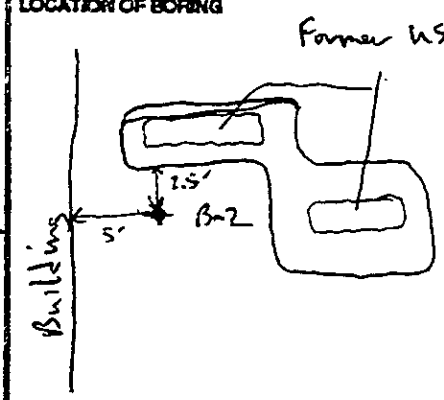
DRILLER: Cascade
DATE: 2/17/98
CHECKED BY:
LOGGED BY: J. LeBlanc

WELL CONSTRUCTION: CASING	WELL CONSTRUCTION: ANNULUS	SOIL SAMPLING: SAMPLER TYPE	SOIL SAMPLING: BLOWS/6" INTERVAL	SOIL SAMPLING: INTERVAL SAMPLED / RECOVERY / ANALYTICAL SAMPLE	DEPTH IN FEET	INSTRUMENT READING (ppm)	ESTIMATED PERCENT: GRAVEL	ESTIMATED PERCENT: SAND	ESTIMATED PERCENT: FINES	MUNSELL COLOR NO.	USCS GROUP SYMBOL	DESCRIPTION: Group Name, Moisture, Color, Consistency, Density, Other
					0							Asphalt 1"
												Gravel Fill
					1	∅			100		CL	Clay, moist, dark gray, medium stiff, no odors
					2							
					3	6						Slight degraded gas odor / bay mud odor
					4							
					5	2						
					6							
					7	2						
					8							Color change to gray, some mottling, slight gas odor / bay mud odor
										10YR		▽
					9	∅	30		20	6/1	GC	Clayey-Gravel, wet, gray, no odors Gravels to 1".
					10			30	70		CL	Sandy-Clay, moist, yellow-orange, medium stiff, no odors. Sands (fine – coarse).
					1	∅						
					2	∅						
					3							Total Depth 12'
					4							
					5							Install temporary casing. Sample @ 12:15. (TPHg / BTEX / MTBE / TPHd)
					6							
					7							
					8							
					9							

Brown and Caldwell Consultants

BOREHOLE/WELL LO

LOCATION OF BORING



CLIENT	UC Berkeley
LOCATION	Gill Tract, Albany
JOB NO.	6434-01
BORING NO.	B-2
SHEET	1 of 1

	AT TIME OF DRILLING	SECOND	THIRD	FOURTH
WATER LEVEL	2.9'	3.4'		
TIME	11:00	12:20		
DATE	2/17/98	2/17/98		

	START	FINISH
DRILLING TIME	10:15	11:00
DRILLING DATE	2/17/98	2/17/98
WELL CONSTR. TIME		
WELL CONSTR. DATE		

DRILLING CONTRACTOR Kuilhang

RIG TYPE Geoprobe

DRILLING METHOD, FLUID USED Direct Push

SOIL SAMPLING METHOD Continuous Core

SURFACE ELEV.

MONITORING INSTRUMENT PID

SURFACE CONDITIONS Asphalt

WELL CONSTRUCTION: CASING	WELL CONSTRUCTION: ANNULUS	SOIL SAMPLING: SAMPLER TYPE	SOIL SAMPLING: BLOWS/6" INTERVAL	SOIL SAMPLING: INTERVAL SAMPLED	SOIL SAMPLING: RECOVERY	SOIL SAMPLING: ANALYTICAL SAMPLE	DEPTH IN FEET	INSTRUMENT READING (ppm)	ESTIMATED PERCENT: GRAVEL	ESTIMATED PERCENT: SAND	ESTIMATED PERCENT: FINES	MUNSELL COLOR NO.	USCS GROUP SYMBOL	DESCRIPTION: Group Name, Moisture, Color, Consistency, Density, Other
							0							Asphalt 1"
														Gravel fill Hand auger to 2' bgs
							1				100		CL	Clay, moist, dark grey, medium stiff
								∅						no odors
							2							
								20						Degraded oil odor
							3							
														4-8' Sample tube is wet.
							4							
							5							
							6							
							7	18						Slightly degraded oil odor
							8							
							9		80		20		GC	Clayey-Gravel, moist, grey, gravels to 1", no odors
								∅			100		CL	Clay, moist, greenish-grey w/ mottling, medium stiff, no odors
							10			30	70		CL	Sandy-Clay, moist, yellow-orange, medium stiff, no odors, sands - fine.
									30	40	30		SC	Clayey-Sand w/ Gravels moist, yellow-orange, sands fine-medium. no odors
							12	∅						
														Total Depth 12'
														Install temporary ~~well~~ casing. Sample @ 12:25 (TPHg / BTEX / MTBE / TPHd)

DRILLER Gauge

DATE

CHECKED BY

DATE 2/17/98

LOGGED BY Joe LaPlante

EXHIBIT B

ANALYTICAL LABORATORY DATA SHEETS

EXHIBIT B

ANALYTICAL LABORATORY DATA SHEETS

WEST LABORATORY

Sample Log 18016
February 24, 1998

Todd Miller
Brown and Caldwell
P.O. Box 8045
Walnut Creek, CA 94596-1220

Subject : 3 Water and 6 Soil samples
Project Name : U C Berkeley
Project Number :

Dear Mr. Miller,

Chemical analysis on the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. USEPA protocols for sample storage and preservation were followed.

WEST Laboratory is certified by the State of California (# 1346). If you have any questions regarding procedures or results, please call me at 530-757-0920.

Sincerely,

S. Podolsky

Stewart Podolsky

1046 Olive Drive, Suite 2 • Davis, CA 95616 • (530) 757-0920 • Fax (530) 753-6091

WEST LABORATORY

Sample Log 18016

MTBE (Methyl-t-butyl ether) By EPA Method 8020/602

From : U C Berkeley
Sampled : 02/17/98
Received : 02/17/98
Matrix : Soil

SAMPLE	Date Analyzed	(MRL) mg/kg	Measured Value mg/kg
B-1 3.5-4.0'	02/20/98	(.050)	<.050
B-1 7.5-8.0	02/20/98	(.050)	<.050
B-2 3.5-4.0'	02/20/98	(.050)	<.050
B-2 7.5-8.0'	02/20/98	(.050)	<.050
B-3 4.0-4.5'	02/20/98	(.050)	<.050
B-3 7.5-8.0'	02/20/98	(.050)	<.050

Approved By:

Stewart Podolsky
Senior Chemist

1046 Olive Drive, Suite 2 • Davis, CA 95616 • (530) 757-0920 • Fax (530) 753-6091

WEST LABORATORY

Sample Log 18016

MTBE (Methyl-t-butyl ether) By EPA Method 8020/602

From : U C Berkeley
Sampled : 02/17/98
Received : 02/17/98
Matrix : Water

SAMPLE	Date Analyzed	(MRL) ug/L	Measured Value ug/L
B-1 G.W	02/20/98	(5.0)	<5.0
B-2 G.W	02/20/98	(5.0)	100
B-3 G.W	02/20/98	(5.0)	<5.0

Approved By:

Stewart Podolsky
Senior Chemist

1046 Olive Drive, Suite 2 • Davis, CA 95616 • (530) 757-0920 • Fax (530) 753-6091

WEST LABORATORY

Sample Log 18016

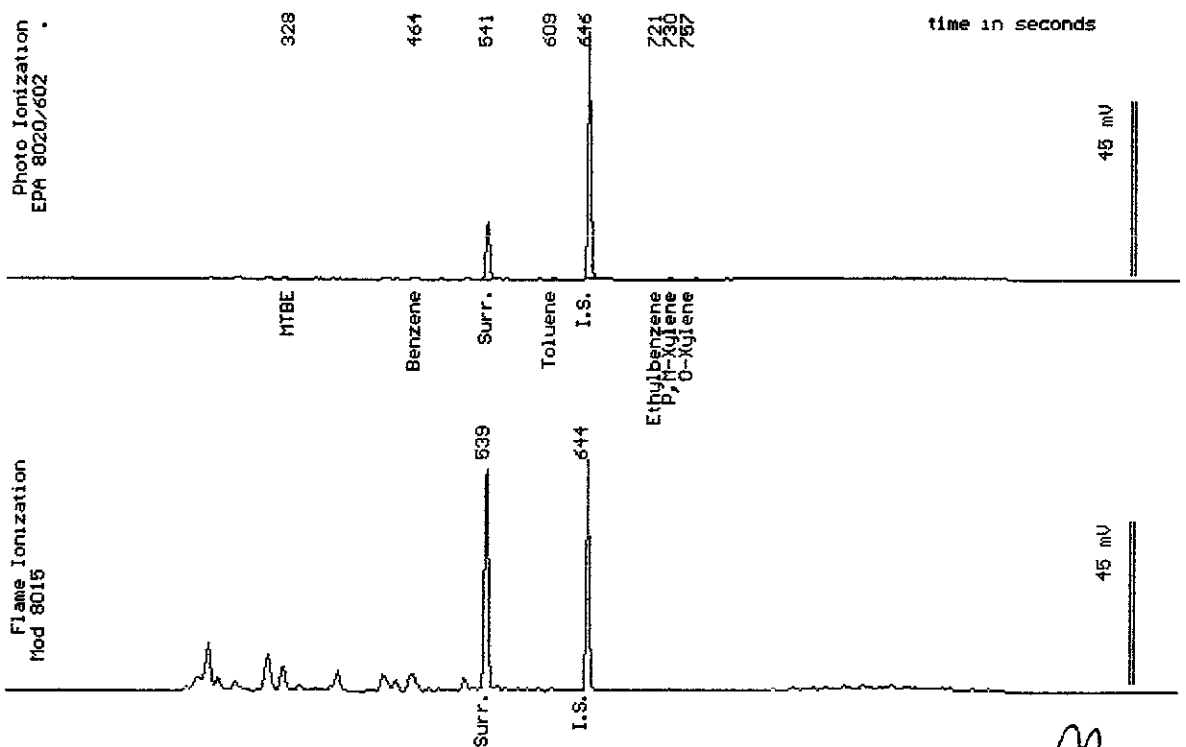
18016-01

Sample: B-1 3.5-4.0'

From : U C Berkeley
Sampled : 02/17/98
Dilution : 1:1
Matrix : Soil

Run Log : 2168T

Parameter	(MRL) mg/kg	Measured Value mg/kg
Benzene	(.0050)	<.0050
Toluene	(.0050)	<.0050
Ethylbenzene	(.0050)	<.0050
Total Xylenes	(.0050)	<.0050
TPH as Gasoline	(1.0)	<1.0
Surrogate Recovery		102 %



Date Analyzed: 02-20-98
Column : 0.53mm X 60m Restek Rtx-1301

Stewart Podolsky
Senior Chemist

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WEST LABORATORY

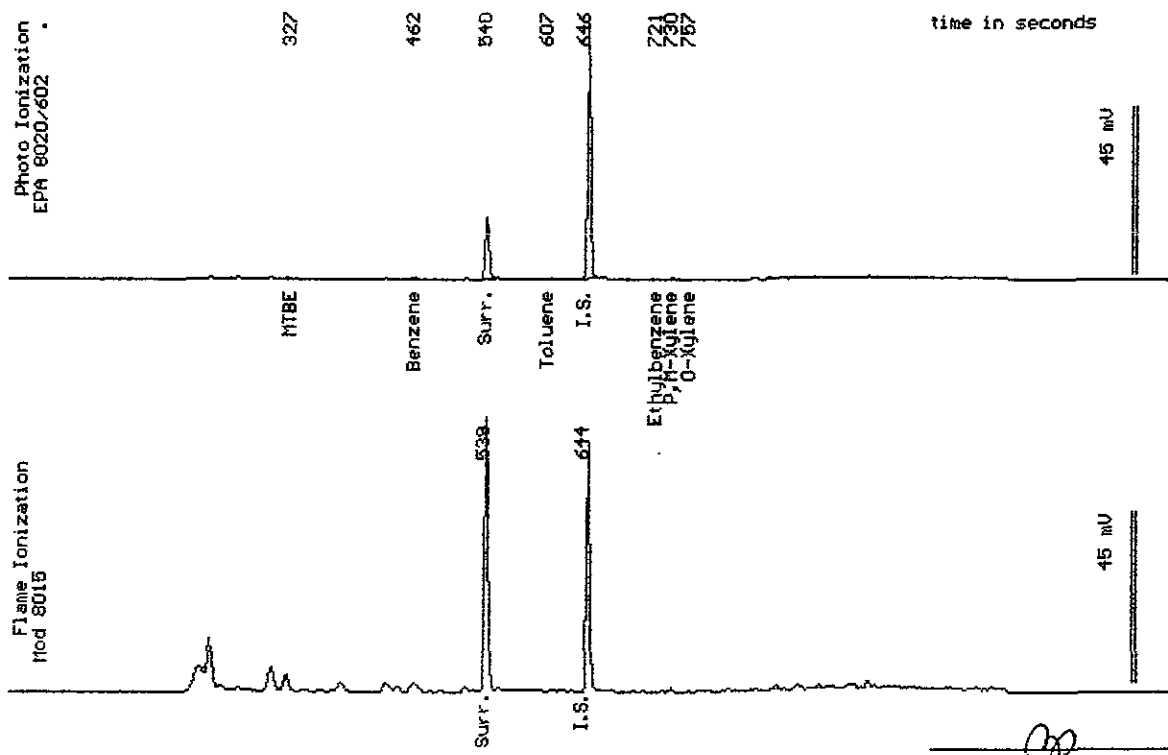
Sample Log 18016

18016-02

Sample: **B-1 7.5-8.0**

From : U C Berkeley
Sampled : 02/17/98
Dilution : 1:1 Run Log : 2168T
Matrix : Soil

Parameter	(MRL) mg/kg	Measured Value mg/kg
Benzene	(.0050)	<.0050
Toluene	(.0050)	<.0050
Ethylbenzene	(.0050)	<.0050
Total Xylenes	(.0050)	<.0050
TPH as Gasoline	(1.0)	<1.0
Surrogate Recovery		100 %



Date Analyzed: 02-20-98
Column : 0.53mm X 60m Restek Rtx-1301

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Senior Chemist

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WEST LABORATORY

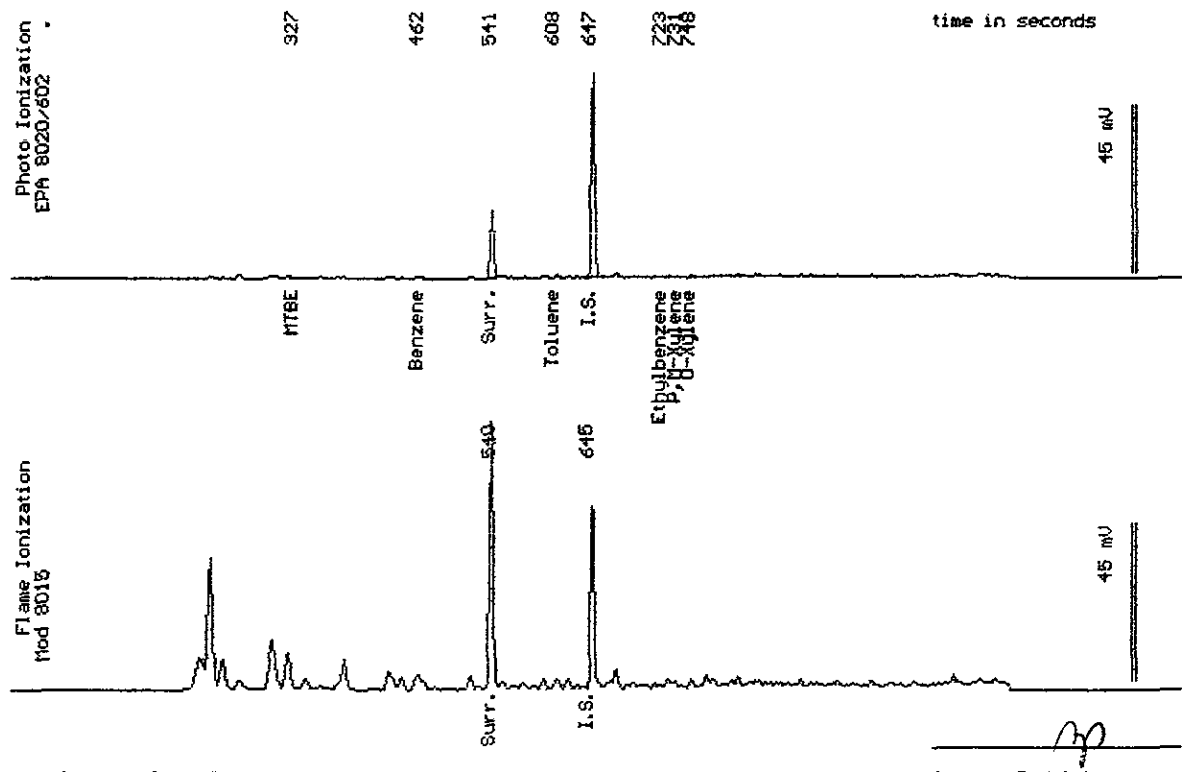
Sample Log 18016

18016-03

Sample: B-2 3.5-4.0'

From : U C Berkeley
Sampled : 02/17/98
Dilution : 1:1 Run Log : 2168T
Matrix : Soil

Parameter	(MRL) mg/kg	Measured Value mg/kg
Benzene	(.0050)	<.0050
Toluene	(.0050)	<.0050
Ethylbenzene	(.0050)	<.0050
Total Xylenes	(.0050)	<.0050
TPH as Gasoline	(1.0)	<1.0
Surrogate Recovery		103 %



Date Analyzed: 02-20-98
Column : 0.53mm X 60m Restek Rtx-1301

Stewart Podolsky
Senior Chemist

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WEST LABORATORY

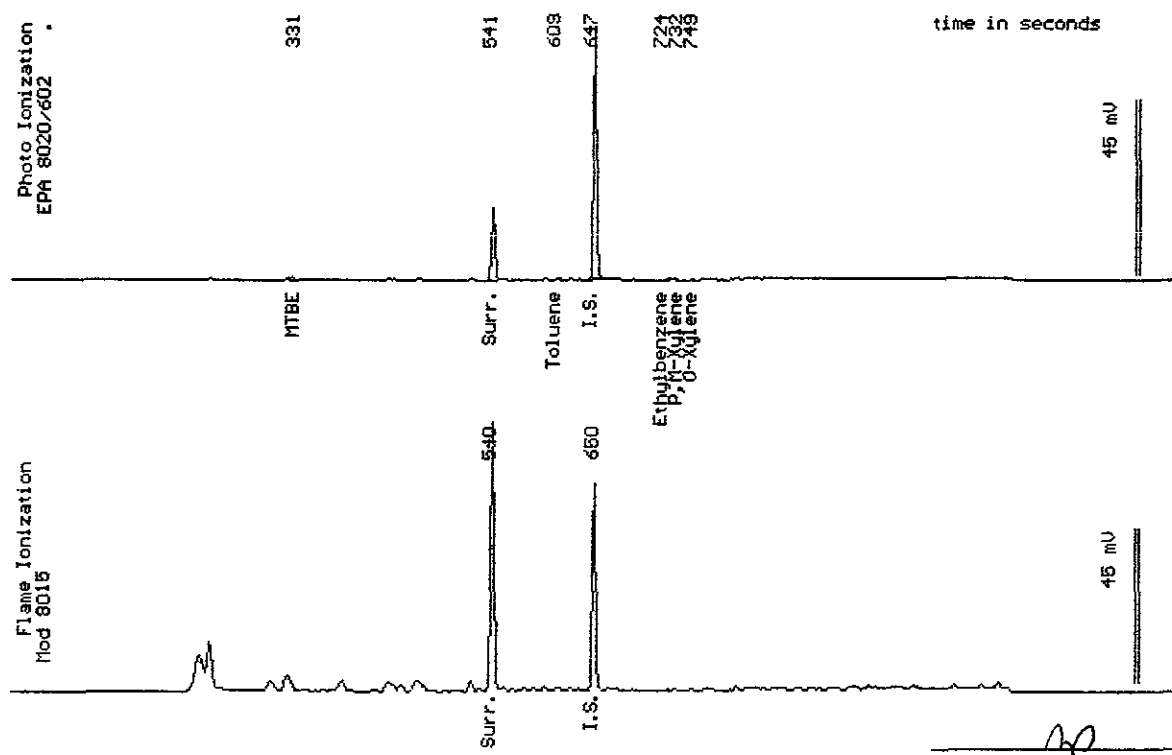
Sample Log 18016

18016-04

Sample: B-2 7.5-8.0'

From : U C Berkeley
Sampled : 02/17/98
Dilution : 1:1 Run Log : 2168T
Matrix : Soil

Parameter	(MRL) mg/kg	Measured Value mg/kg
Benzene	(.0050)	<.0050
Toluene	(.0050)	<.0050
Ethylbenzene	(.0050)	<.0050
Total Xylenes	(.0050)	<.0050
TPH as Gasoline	(1.0)	<1.0
Surrogate Recovery		104 %



Date Analyzed: 02-20-98
Column : 0.53mm X 60m Restek Rtx-1301

Stewart Podolsky
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WEST LABORATORY

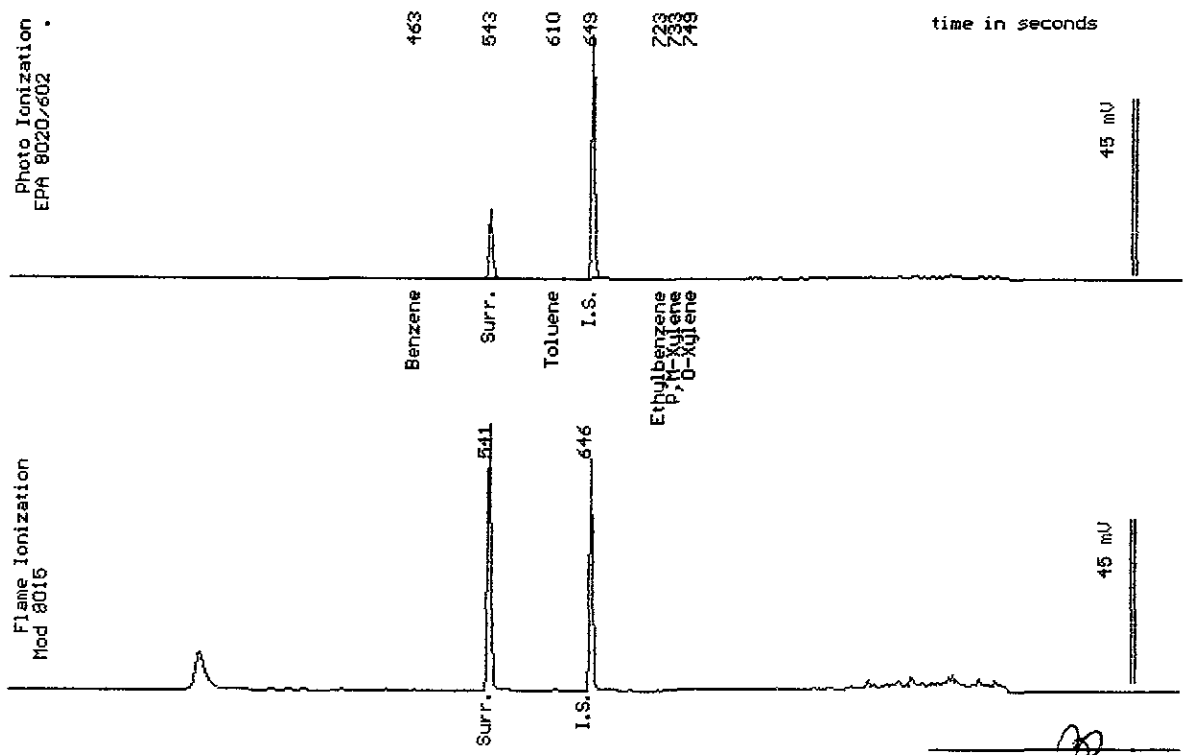
Sample Log 18016

18016-05

Sample: B-3 4.0-4.5'

From : U C Berkeley
Sampled : 02/17/98
Dilution : 1:1 Run Log : 2168T
Matrix : Soil

Parameter	(MRL) mg/kg	Measured Value mg/kg
Benzene	(.0050)	<.0050
Toluene	(.0050)	<.0050
Ethylbenzene	(.0050)	<.0050
Total Xylenes	(.0050)	<.0050
TPH as Gasoline	(1.0)	<1.0
Surrogate Recovery		102 %



Date Analyzed: 02-20-98
Column : 0.53mm X 60m Restek Rtx-1301

Steuart Podolsky
Senior Chemist

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WEST LABORATORY

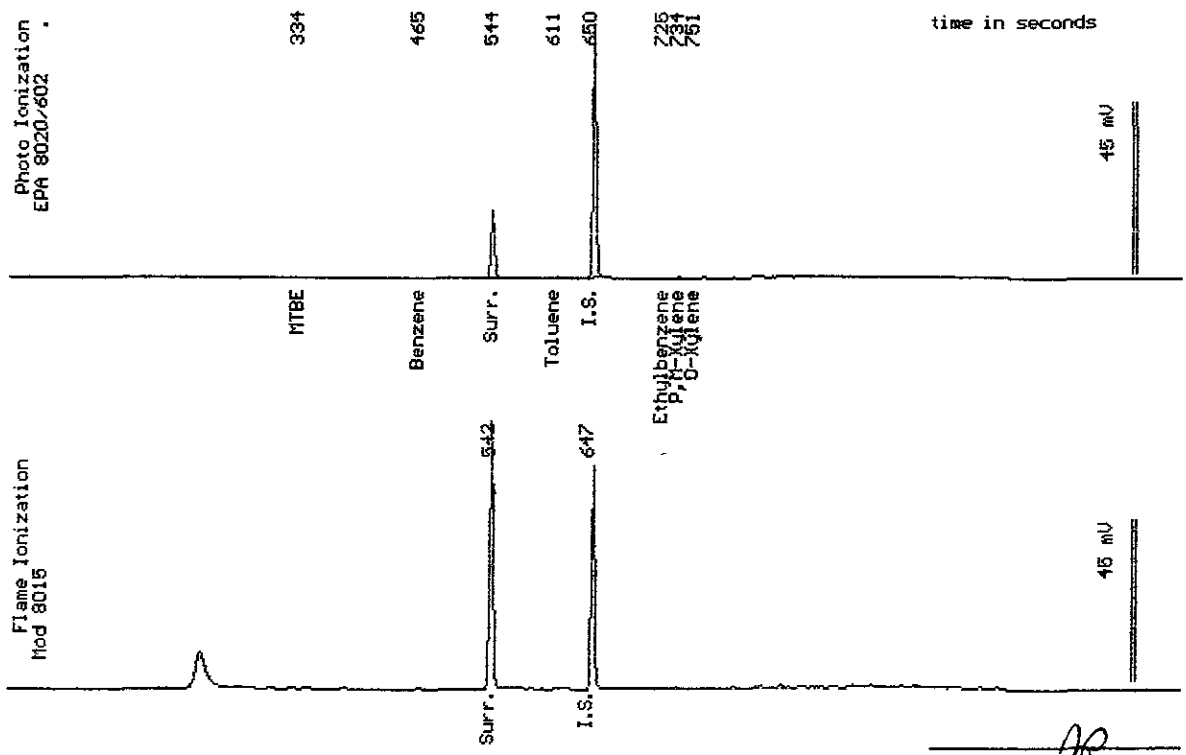
Sample Log 18016

18016-06

Sample: B-3 7.5-8.0'

From : U C Berkeley
Sampled : 02/17/98
Dilution : 1:1 Run Log : 2168T
Matrix : Soil

Parameter	(MRL) mg/kg	Measured Value mg/kg
Benzene	(.0050)	<.0050
Toluene	(.0050)	<.0050
Ethylbenzene	(.0050)	<.0050
Total Xylenes	(.0050)	<.0050
TPH as Gasoline	(1.0)	<1.0
Surrogate Recovery		101 %



Date Analyzed: 02-20-98
Column : 0.53mm X 60m Restek Rtx-1301

Stewart Podolsky
Senior Chemist

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WEST LABORATORY

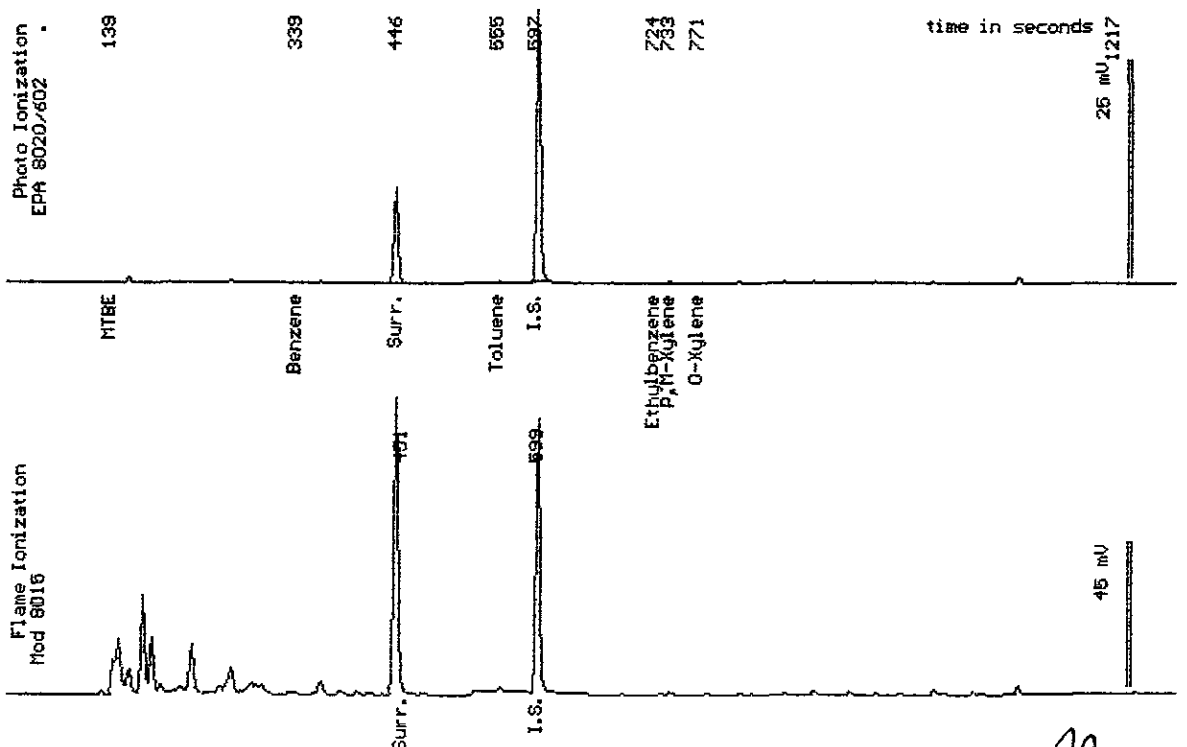
Sample Log 18016

18016-07

Sample: **B-1 G.W**

From : U C Berkeley
Sampled : 02/17/98
Dilution : 1:1 Run Log : 4170J
Matrix : Water

Parameter	(MRL) ug/L	Measured Value ug/L
Benzene	(.50)	<.50
Toluene	(.50)	<.50
Ethylbenzene	(.50)	<.50
Total Xylenes	(.50)	<.50
TPH as Gasoline	(50)	<50
Surrogate Recovery		111 %



Date Analyzed: 02-20-98
Column : 0.53mm ID X 60m Restek Rtx-1701

Stewart Podolsky
Senior Chemist

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WEST LABORATORY

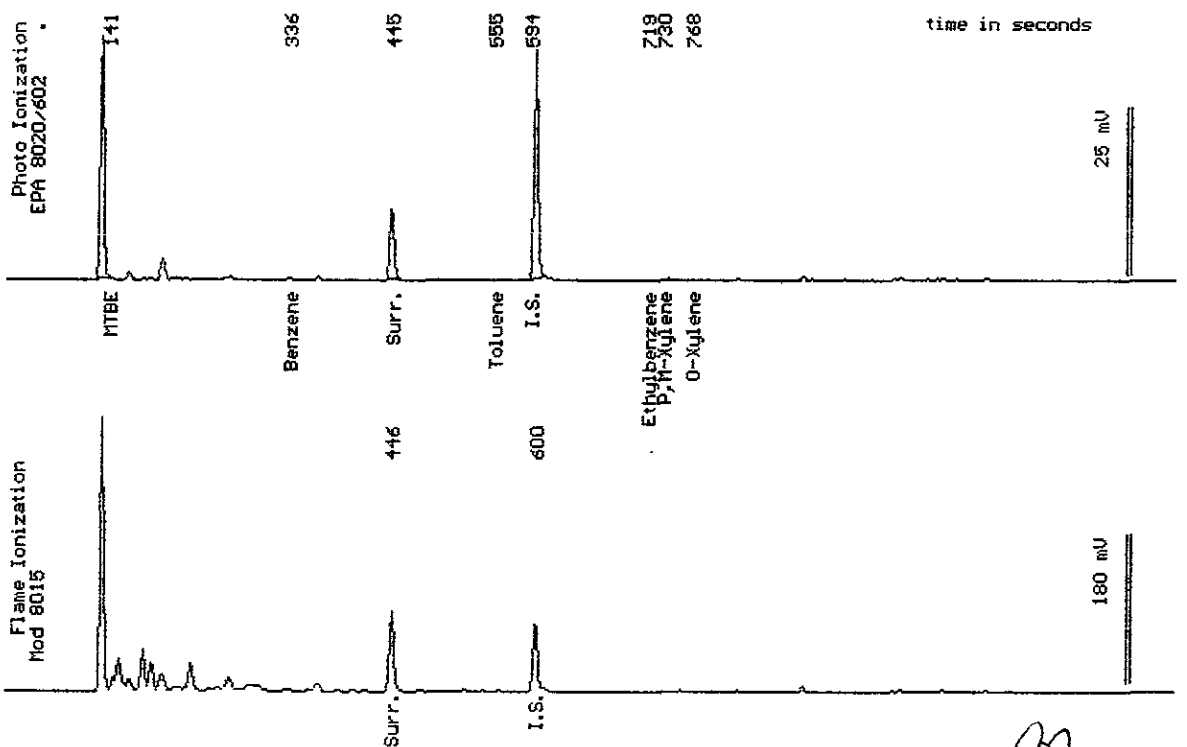
Sample Log 18016

18016-08

Sample: **B-2 G.W**

From : U C Berkeley
Sampled : 02/17/98
Dilution : 1:1 Run Log : 4170J
Matrix : Water

Parameter	(MRL) ug/L	Measured Value ug/L
Benzene	(.50)	<.50
Toluene	(.50)	<.50
Ethylbenzene	(.50)	<.50
Total Xylenes	(.50)	<.50
TPH as Gasoline	(50)	100
Surrogate Recovery		108 %



Date Analyzed: 02-20-98
Column : 0.53mm ID X 60m Restek Rtx-1701

Stewart Podolsky
Senior Chemist

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WEST LABORATORY

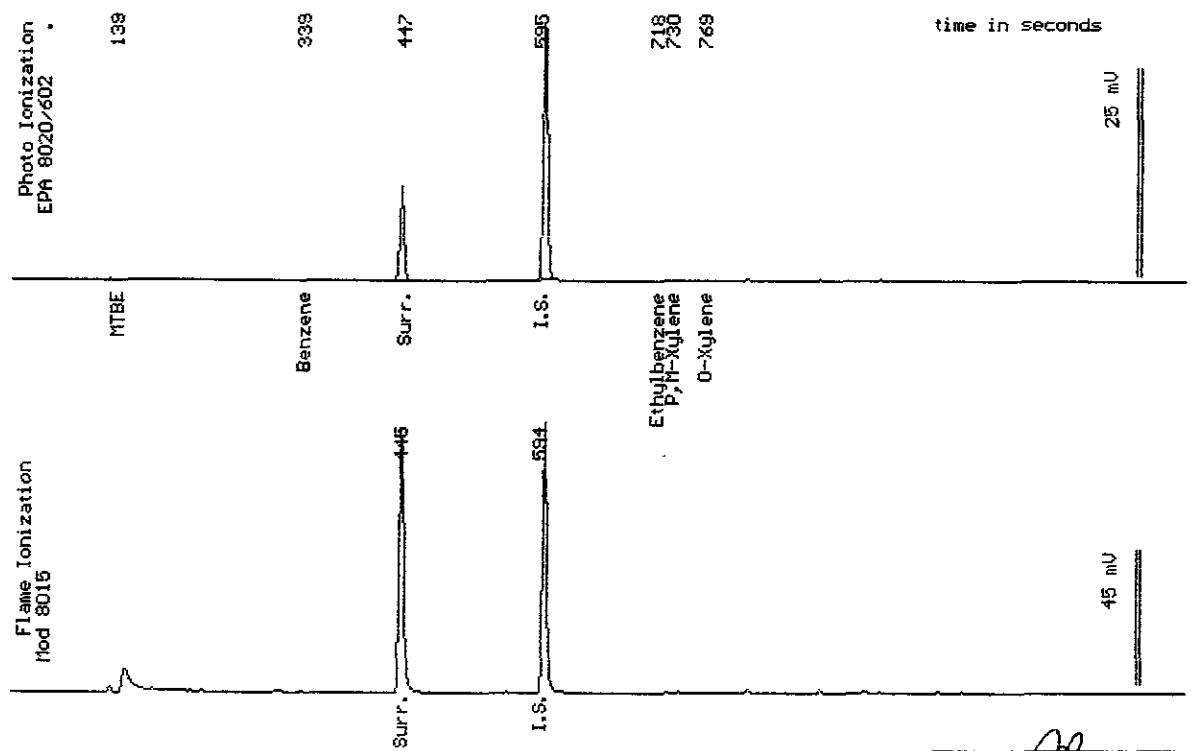
Sample Log 18016

18016-09

Sample: **B-3 G.W**

From : U C Berkeley
Sampled : 02/17/98
Dilution : 1:1 Run Log : 4170J
Matrix : Water

Parameter	(MRL) ug/L	Measured Value ug/L
Benzene	(.50)	<.50
Toluene	(.50)	<.50
Ethylbenzene	(.50)	<.50
Total Xylenes	(.50)	<.50
TPH as Gasoline	(50)	<50
Surrogate Recovery		108 %



Date Analyzed: 02-20-98
Column : 0.53mm ID X 60m Restek Rtx-1701

Stewart Podolsky
Senior Chemist

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WEST LABORATORY

February 23, 1998
Sample Log 18016

QC Report for EPA 8020 & Modified EPA 8015
Run Log : 2168P
From : U C Berkeley
Sample(s) Received : 02/17/98

Parameter	Matrix Spike % Recovery	Matrix Spike Duplicate % Recovery	RPD *
Benzene	91	99	8
Ethylbenzene	93	101	8
TPH as Gasoline	104	111	7

* RPD = Relative Percent Difference

Parameter	Laboratory Control Sample % Recovery
Benzene	93
Ethylbenzene	99
Gasoline	96

Parameter	Method Blank
Benzene	<0.005 mg/Kg
Toluene	<0.005 mg/Kg
Ethylbenzene	<0.005 mg/Kg
Total Xylenes	<0.005 mg/Kg
TPH as Gasoline	<1.0 mg/kg

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WEST LABORATORY

February 23, 1998
Sample Log 18016

QC Report for EPA 602 & Modified EPA 8015
Run Log : 4170J
From : U C Berkeley
Sample(s) Received : 02/17/98

Parameter	Matrix Spike % Recovery	Matrix Spike Duplicate % Recovery	RPD *
Benzene	96	102	6
Ethylbenzene	100	108	8
TPH as Gasoline	103	109	6

* RPD = Relative Percent Difference

Parameter	Laboratory Control Sample % Recovery
Benzene	96
Ethylbenzene	100
Gasoline	94

Parameter	Method Blank
Benzene	<0.50 ug/L
Toluene	<0.50 ug/L
Ethylbenzene	<0.50 ug/L
Total Xylenes	<0.50 ug/L
TPH as Gasoline	<50 ug/L

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WEST LABORATORY

Sample Log 18016
18016-01

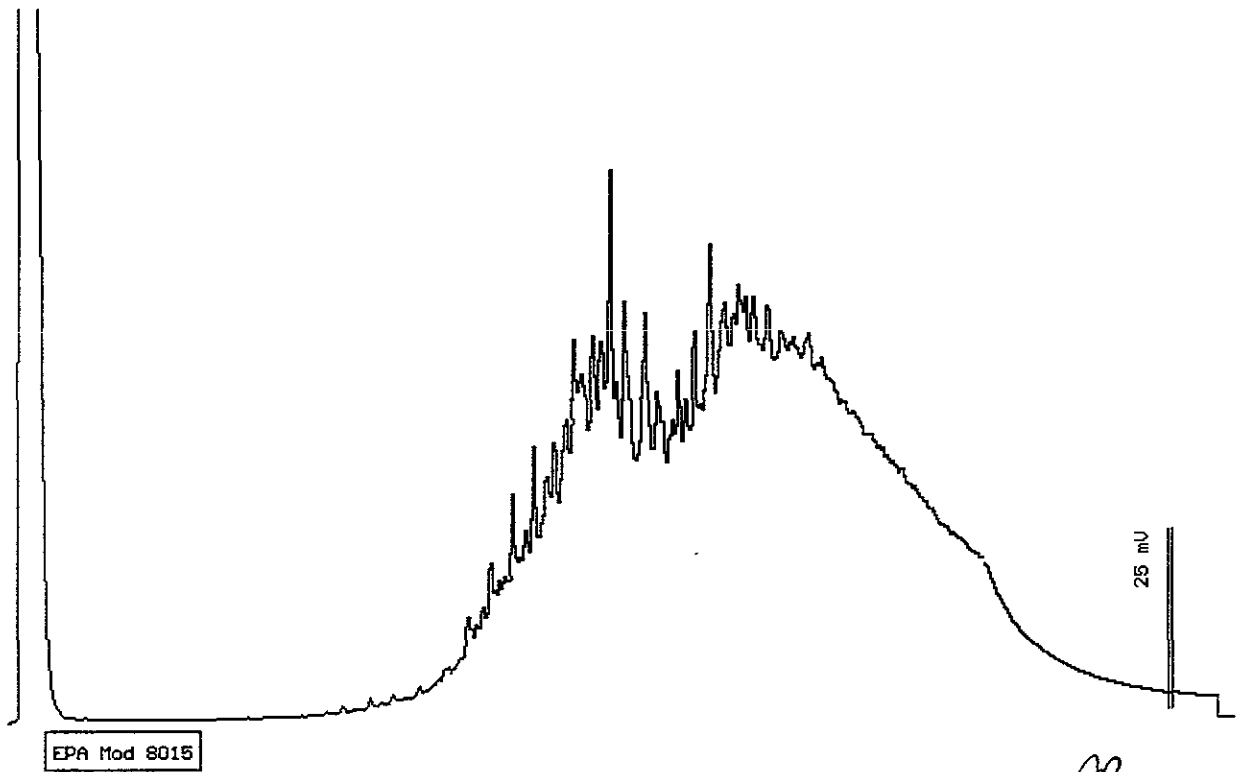
Sample: **B-1 3.5-4.0'**

From : U C Berkeley
Sampled : 02/17/98
Extracted: 02/20/98
Dilution : 1:1
Matrix : Soil

QC Batch : DS980202
Run Log : 7397E

Parameter	(MRL) mg/kg	Measured Value mg/kg
TPH as Diesel	(5.0)	<5.0 *

* Increased reporting limit due to interference from high boiling point compounds.



Date: 02-20-98 Time: 20:23:36
Column : 0.53mm ID X 15m DB1 (J&W Scientific)

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Senior Chemist

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WEST LABORATORY

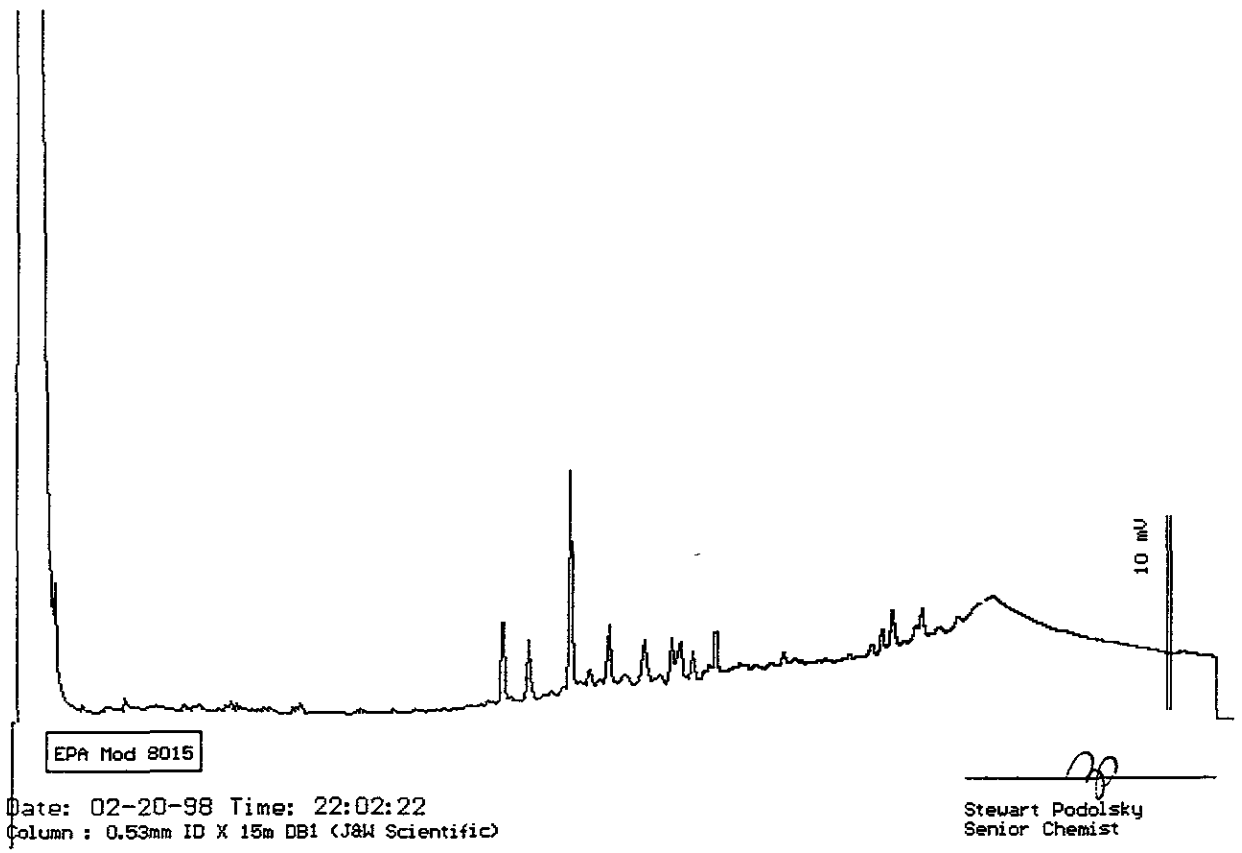
Sample Log 18016
18016-02

Sample: **B-1 7.5-8.0**

From : U C Berkeley
Sampled : 02/17/98
Extracted: 02/20/98
Dilution : 1:1
Matrix : Soil

QC Batch : DS980202
Run Log : 7397E

Parameter	(MRL) mg/kg	Measured Value mg/kg
TPH as Diesel	(1.0)	<1.0



Stewart Podolsky
Senior Chemist

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WEST LABORATORY

Sample Log 18016

18016-03

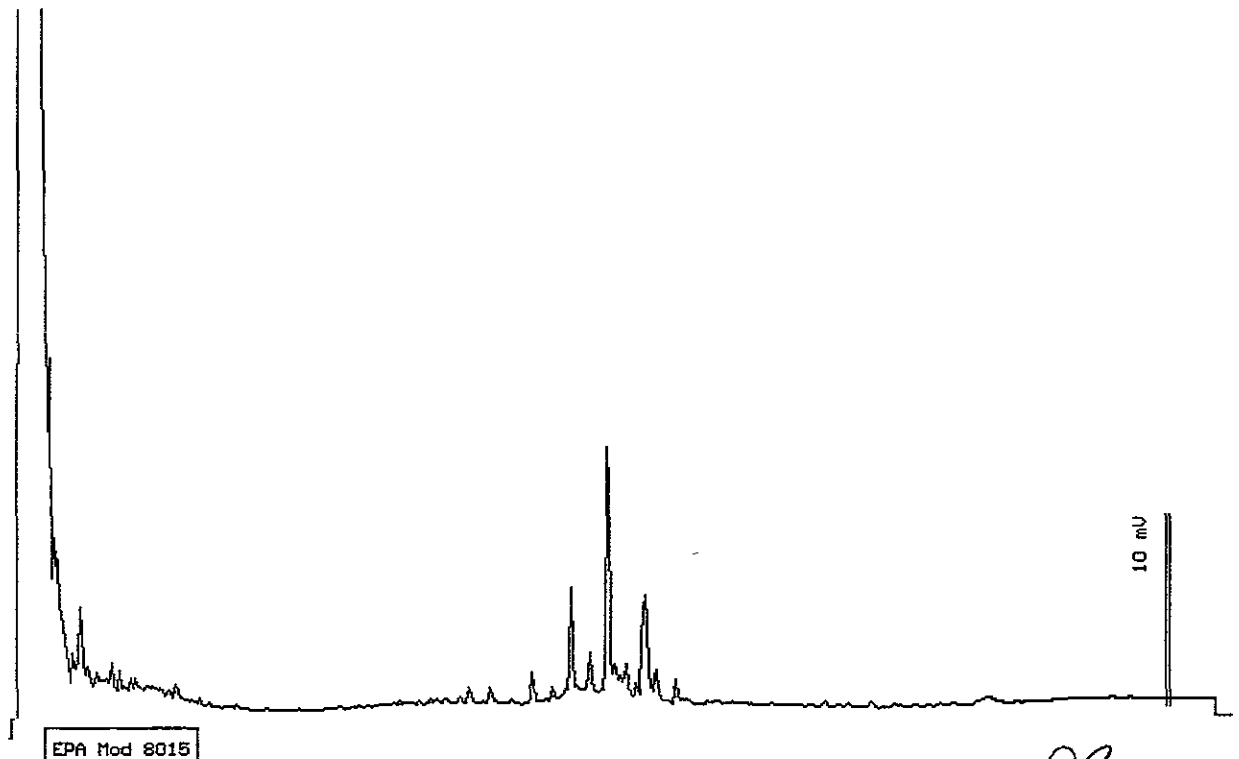
Sample: **B-2 3.5-4.0'**

From : U C Berkeley
Sampled : 02/17/98
Extracted: 02/20/98
Dilution : 1:1
Matrix : Soil

QC Batch : DS980202
Run Log : 7397E

Parameter	(MRL) mg/kg	Measured Value mg/kg
TPH as Diesel	(2.0)	<2.0 *

* Increased reporting limit due to gasoline range interference.



Date: 02-21-98 Time: 00:13:27
Column : 0.53mm ID X 15m DB1 (J&W Scientific)

Stewart Podolsky
Senior Chemist

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WEST LABORATORY

Sample Log 18016
18016-04

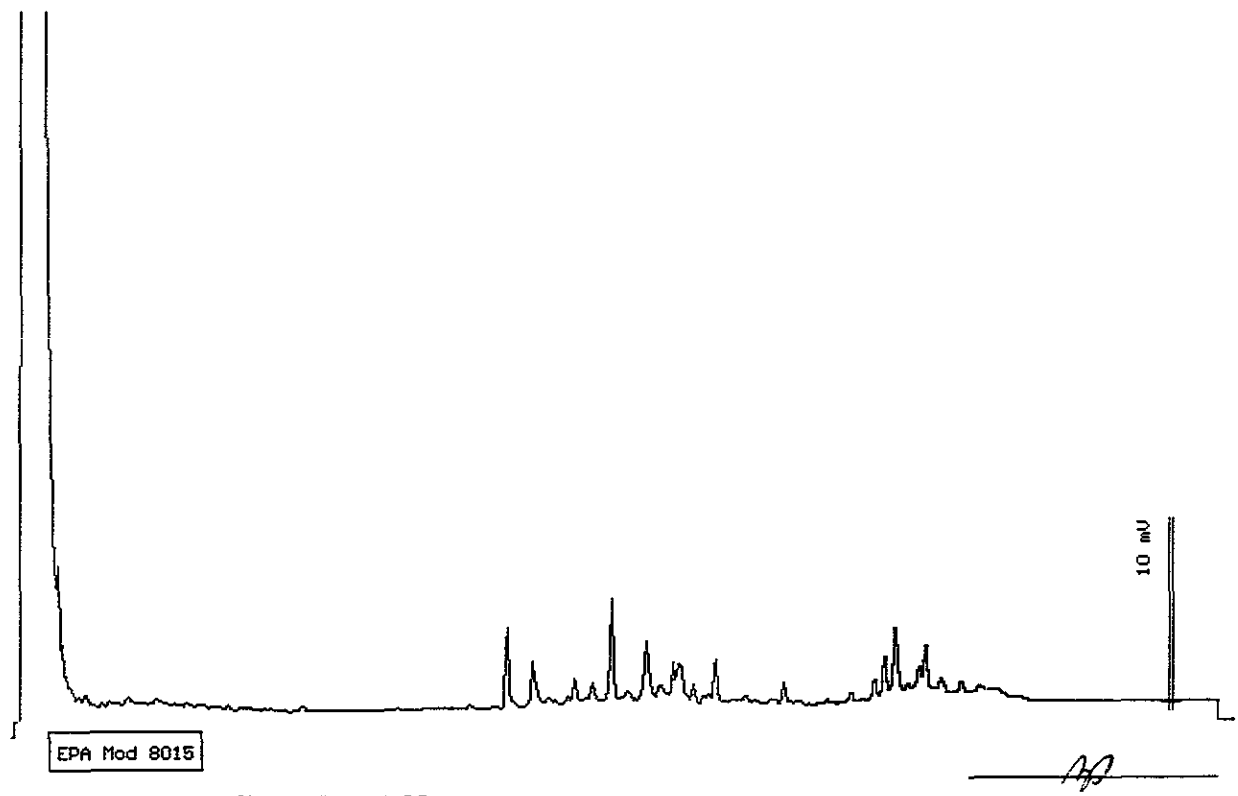
Sample: **B-2 7.5-8.0'**

From : U C Berkeley
Sampled : 02/17/98
Extracted: 02/20/98
Dilution : 1:1
Matrix : Soil

QC Batch : DS980202
Run Log : 7397E

Parameter	(MRL) mg/kg	Measured Value mg/kg
TPH as Diesel	(2.0)	<2.0 *

* Increased reporting limit due to interference from high boiling point compounds.



Date: 02-21-98 Time: 00:46:09
Column : 0.53mm ID X 15m DB1 (J&W Scientific)

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WEST LABORATORY

Sample Log 18016
18016-05

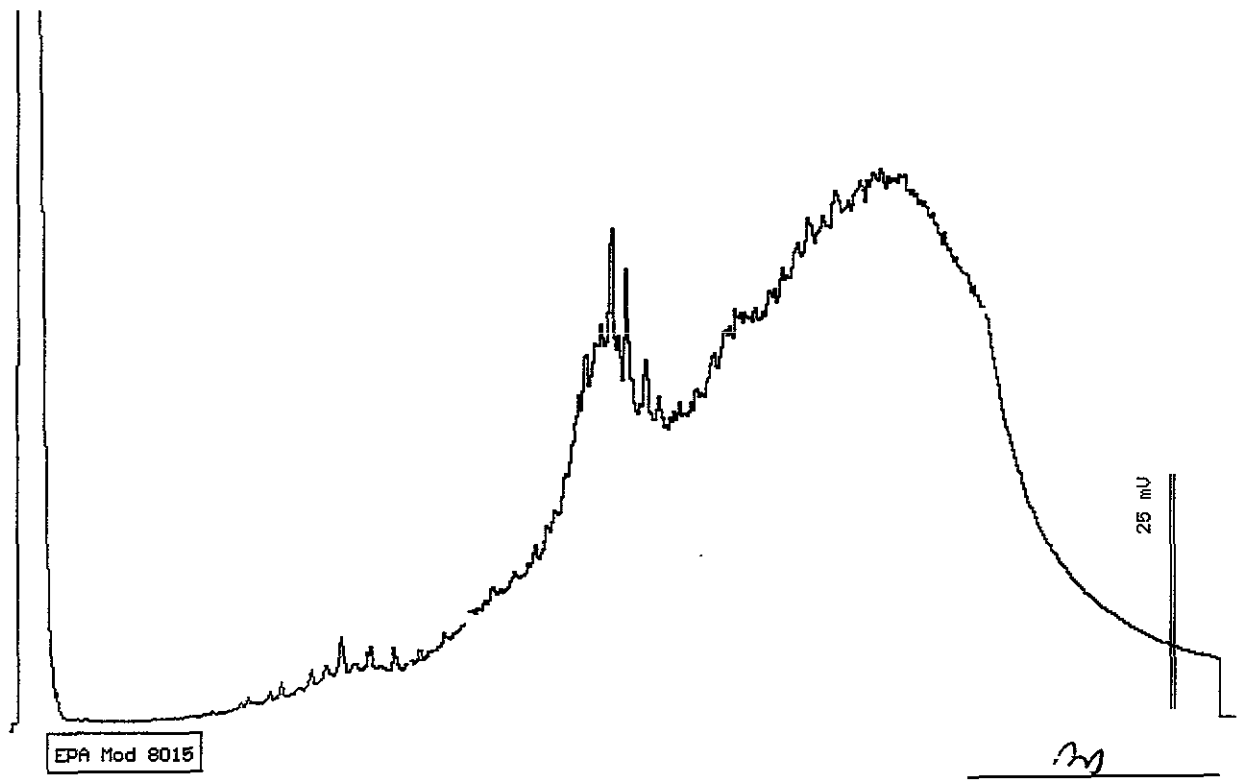
Sample: **B-3 4.0-4.5'**

From : U C Berkeley
Sampled : 02/17/98
Extracted: 02/20/98
Dilution : 1:1
Matrix : Soil

QC Batch : DS980202
Run Log : 7397E

Parameter	(MRL) mg/kg	Measured Value mg/kg
TPH as Diesel	(6.0)	<6.0 *

* Increased reporting limit due to interference from high boiling point compounds.



Date: 02-21-98 Time: 01:18:48
Column : 0.53mm ID X 15m DB1 (J&W Scientific)

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WEST LABORATORY

Sample Log 18016
18016-06

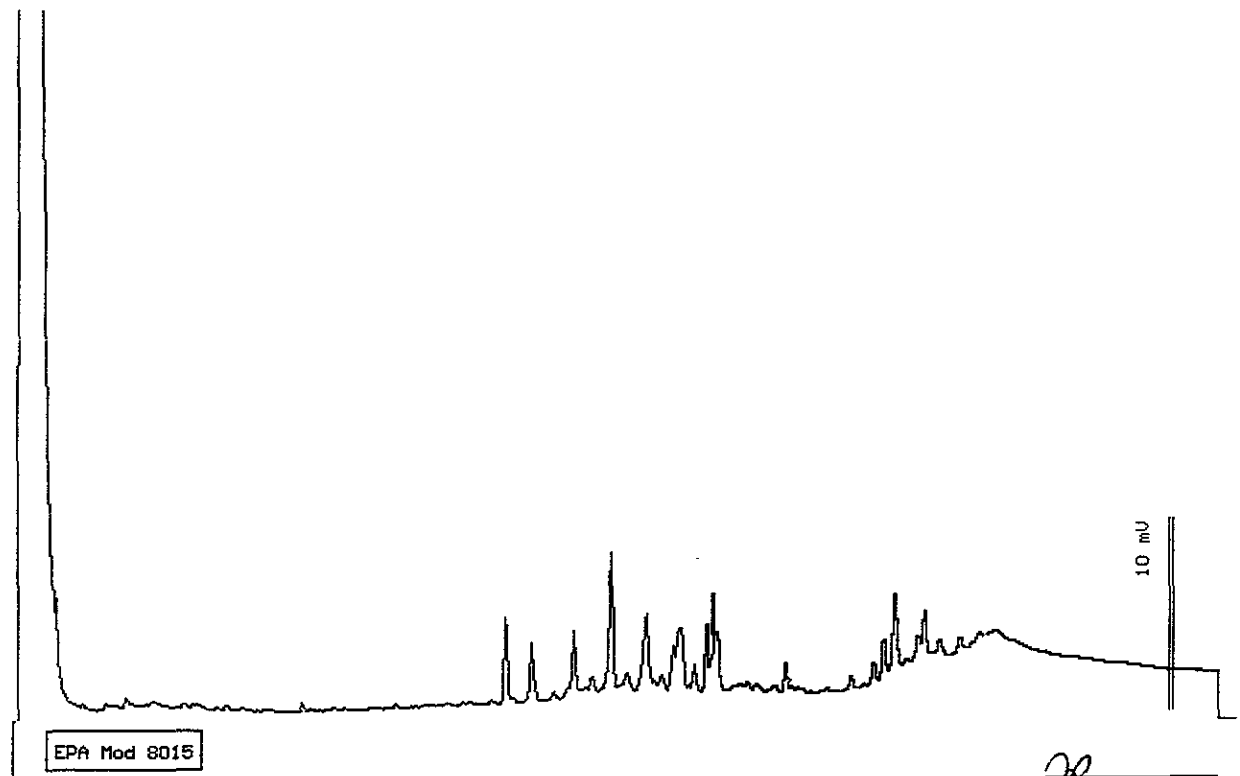
Sample: **B-3 7.5-8.0'**

From : U C Berkeley
Sampled : 02/17/98
Extracted: 02/20/98
Dilution : 1:1
Matrix : Soil

QC Batch : DS980202
Run Log : 7397E

Parameter	(MRL) mg/kg	Measured Value mg/kg
TPH as Diesel	(2.0)	<2.0 *

* Increased reporting limit due to interference from non-diesel organics.



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Senior Chemist

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WEST LABORATORY

Sample Log 18016
18016-07

Sample: **B-1 G.W**

From : U C Berkeley
Sampled : 02/17/98
Extracted: 02/20/98
Dilution : 1:1
Matrix : Water

QC Batch : DW980205
Run Log : 7397E

Parameter	(MRL) ug/L	Measured Value ug/L
TPH as Diesel	(50)	<50

Date: 02-20-98 Time: 17:37:09
Column : 0.53mm ID X 15m DB1 (J&W Scientific)

Stewart Podolsky
Senior Chemist

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WEST LABORATORY

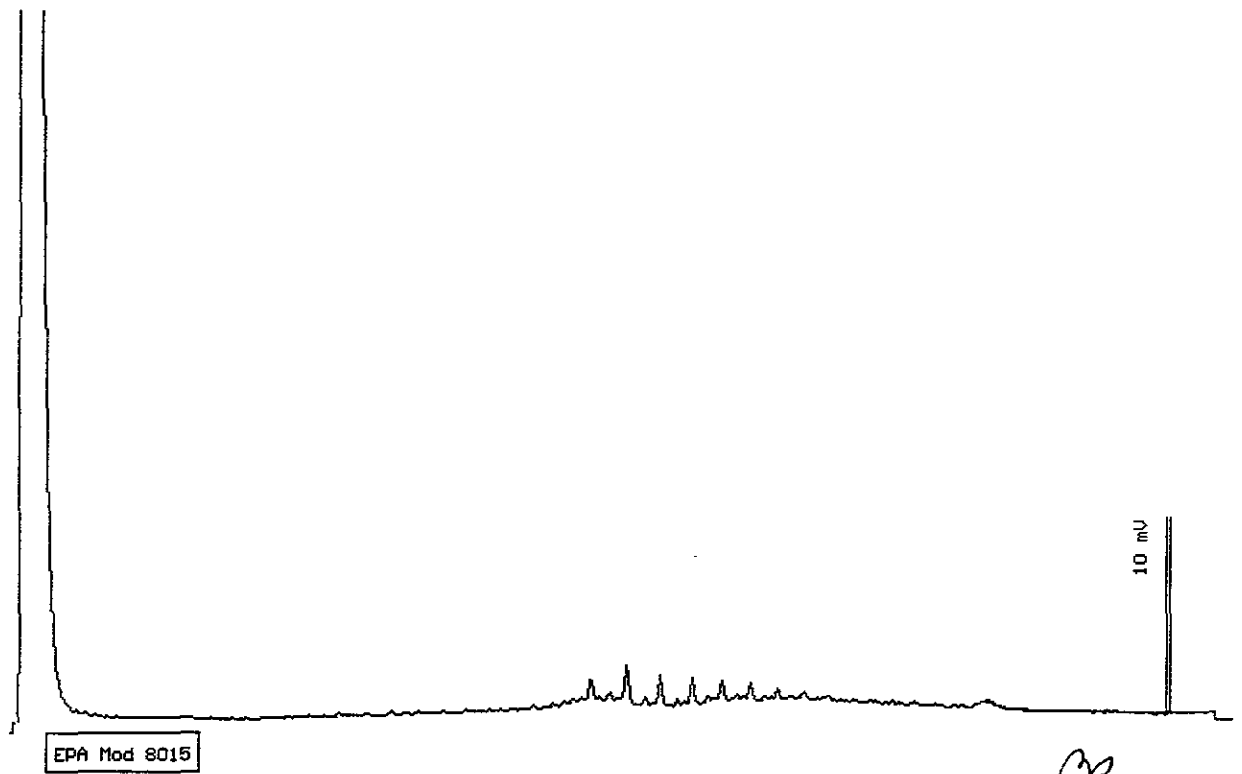
Sample Log 18016
18016-08

Sample: **B-2 G.W**

From : U C Berkeley
Sampled : 02/17/98
Extracted: 02/20/98
Dilution : 1:1
Matrix : Water

QC Batch : DW980205
Run Log : 7397E

Parameter	(MRL) ug/L	Measured Value ug/L
TPH as Diesel	(50)	<50



Date: 02-20-98 Time: 18:10:21
Column : 0.53mm ID X 15m DB1 (J&W Scientific)

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Senior Chemist

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WEST LABORATORY

Sample Log 18016
18016-09

Sample: **B-3 G.W**

From : U C Berkeley
Sampled : 02/17/98
Extracted: 02/20/98
Dilution : 1:1
Matrix : Water

QC Batch : DW980205
Run Log : 7397E

Parameter	(MRL) ug/L	Measured Value ug/L
TPH as Diesel	(50)	<50

Date: 02-20-98 Time: 18:43:27
Column : 0.53mm ID X 15m DB1 (J&W Scientific)

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Senior Chemist

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WEST LABORATORY

February 24, 1998

QC Report
TPH Diesel by 8015 Mod

QC Batch: DS980202 Matrix: Soil

Spike and Spike Duplicate Results

Parameter	Matrix Spike (%Rec)	Matrix Spike Dup. (%Rec)	RPD %
Spiked sample too hot for analyte recovery.			

Laboratory Control Spike

Parameter	Laboratory Control Spike (%Rec)
TPH as Diesel	107

Method Blank

Parameter	MDL(mg/Kg)	Measured Value(mg/Kg)
TPH as Diesel	(1.0)	<1.0
TPH as Motor Oil	(10)	< 10

Stewart Podolsky
Senior Chemist

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WEST LABORATORY

February 23, 1998

QC Report
TPH Diesel/Motor Oil by 8015 Mod

QC Batch DW980205 Matrix: Water

Spike and Spike Duplicate Results

Parameter	Matrix Spike (%Rec)	Matrix Spike Dup. (%Rec)	RPD %
TPH as Diesel	Not enough sample for spiking. See duplicate LCS Data.		

Laboratory Control Spike

Parameter	Laboratory Control Spike (%Rec)	Laboratory Control Spike Dup. (%Rec)	RPD %
TPH as Diesel	78	91	15

Method Blank

Parameter	MDL(ug/L)	Measured Value(ug/L)
TPH as Diesel	(50)	<50
TPH as Motor Oil	(100)	<100

Stewart Podolsky
Senior Chemist

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CHAIN OF CUSTODY RECORD

BCA Log Number _____

Client name	Brown Caldwell	Project or PO#	UC Berkeley
Address	3480 Buskirk Avenue	Phone #	(510) 937-9010
City, State, Zip	Pleasant Hill, CA 94523	Report attention	T. Miller

18016

Lab Sample number	Date sampled	Time sampled	Type* See key below	Sampled by J. LaPlante. Sample description	Number of containers	TPH-G	TPH-D	BTEX	MTBE				Hazardous sample Special handling required	Remarks
18016-01	2/17/98	–	SO	B-1 3.5-4.0'	1	X	X	X	X					Standard 1-Week
-02	|	–	SO	B-1 7.5-8.0	1	X	X	X	X					T-A-T
-03	|	–	SO	B-2 3.5-4.0'	1	X	X	X	X					
-04	|	–	SO	B-2 7.5-8.0'	1	X	X	X	X					
-05	|	–	SO	B-3 4.0-4.5'	1	X	X	X	X					
-06	2/17/98	–	SO	B-3 7.5-8.0'	1	X	X	X	X					
-07	2/17/98	17:15	GW	B-1 G.W	3	X	X	X	X					
-08	2/17/98	12:25	GW	B-2 G.W	3	X	X	X	X					
-09	2/17/98	14:00	GW	B-3 G.W	3	X	X	X	X					

	Signature	Print Name	Company	Date	Time
Relinquished by	J. LaPlante	J. LaPlante	Brown Caldwell	2/17/98	15:15
Received by	S. Woodfill	S. Woodfill	West	2/17/98	1515
Relinquished by					
Received by					
Relinquished by					
Received by Laboratory					

B C ANALYTICAL

☐ 1085 Shary Circle, Concord, CA 94518 (510) 825-3894
☐ 801 Western Avenue, Glendale, CA 91201 (818) 247-5737
☐ 1200 Gene Autry Way, Anaheim, CA 92805 (714) 978-0113

Note Samples are discarded 30 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client's expense.

Disposal arrangements: _____

*KEY. AG—Aqueous NA—Nonaqueous SL—Sludge GW—Groundwater SO—Soil PE—Petroleum