

PIERS



**Environmental
Services, Inc.**

1330 S. Bascom Ave., Suite F
San Jose, CA 95128

Tel. (408) 559-1248 Fax (408) 559-1224

REPORT OF FINDINGS GROUNDWATER INVESTIGATION

**AT
5940 COLLEGE AVE., OAKLAND, CA.**

**Prepared for: Mr. Patrick Ellwood
1345 Grand Ave.
Piedmont, CA 94610**

**Submitted to: Ms. Eva Chu
Alameda County Health Care Services
Department of Environmental Health
1131 Harbor Bay Parkway, Second Floor
Alameda, CA 94502**

**Prepared by: PIERS Environmental Services
Bennett T Halsted, Project Manager
1330 South Bascom Ave. #F
San Jose, CA 95128**

ENVIRONMENTAL
PROTECTION
99 SEP 30 PM 2:26

SEPTEMBER 27, 1999

Environmental "Hot-Line" (800) 559-1248

1.0 INTRODUCTION

The purpose of this report is to present the findings of a preliminary investigation to determine the presence of hydrocarbons in the groundwater in the vicinity of a historic fuel service site. This report first reviews the known site history, describes the site vicinity, presents investigation protocols and analytical results and concludes with a recommendation for further investigation.

1.1 Site Location

The site is located in a commercial/residential district of Oakland, California on property at 5940 College Ave. (Figure 1).

1.2 Background

The subject site was the location of a gasoline station prior to 1968, utilizing underground gasoline storage tanks.

2.0 INVESTIGATIVE SCOPE OF WORK

Because assessment research showed a historic fuel service use at the site an investigation into a potential historic impact to groundwater was recommended. After tracing existing fuel lines toward the suspected former tank locations, PIERS recovered groundwater grab samples from four locations around the suspected former tank locations.

2.1 Boring Locations

On August 3, and September 1, 1999, four borings were constructed on site to determine the presence of hydrocarbons in the groundwater. Soil borings SB-1 through SB-4 were constructed in the vicinity of the suspected former tank location. The boring locations are shown in Figure 2.

2.2 Reconnaissance Boring Installation and Groundwater Sampling

Prior to mobilization of the drilling equipment on-site, and prior to leaving the site, all associated equipment was thoroughly cleaned to removed all soil, oil, grease, mud, tar, etc. The cleaning process consisted of high pressure steam cleaning of the drilling equipment and a high-pressure hot water final rinse. Before drilling the borings, all drill stems, bits, and other down-hole equipment were cleaned.

2.2.1 Soil Boring Procedure

The borings were advanced using a three inch diameter hand auger to a depth that penetrated a minimum of one foot beneath the water table. All of the soil recovered from the boring was logged under the supervision of a registered civil engineer. Visual and olfactory observations of petroleum hydrocarbons were made and recorded on the boring logs.

2.2.2 Groundwater Grab Sampling Procedures

After completion, each boring was allowed to recharge with groundwater. Then, a new, disposable bailer was inserted into the boring for recovery of a groundwater grab sample. The groundwater was emptied into sample containers obtained directly from the analytical laboratory. An effort was made to minimize exposure of the sample to air.

Sample containers were labeled with self-adhesive tags. Field personnel labeled each tag, using waterproof ink, with the following information: Sampling location and number; Project name; Date and time samples were collected; Treatment (preservatives, filtered, etc.); Name of sampler.

Subsequent to collection, the samples were immediately stored on ice in an appropriate ice chest. Samples were transferred under Chain-of-Custody procedures to a State Certified Laboratory.

The borings were backfilled immediately after completion of the sampling and removal of the well casings, with a cement grout mixture containing approximately 3% bentonite.

2.2.3 Laboratory Analyses

The following analyses was performed by Entech Analytical Labs of Sunnyvale on groundwater samples obtained from each boring:

TPH-gas (EPA Method 8015M); BTEX, MTBE (EPA Method 8020)

The results of the groundwater samples were as follows:

Results in Parts Per Billion (PPB)

Sample#	TPH/g	Benzene	Toluene	EthylBenzene	Xylene	MTBE
SB1	5100	43	34	40	ND	110
SB2	ND	ND	ND	ND	ND	ND
SB3	59,000	3500	310	2000	1900	650
SB4	190,000	890	110	4000	7500	1100 → ND w/ 8240

The following analyses was performed by Entech Analytical Labs of Sunnyvale on groundwater sample obtained from boring SB-4:

Oxygenates (EPA Method 8240)

The results of the groundwater sample indicated non-detectable levels of the fuel oxygenating constituents tested.

3.0 CONCLUSIONS AND RECOMMENDATIONS

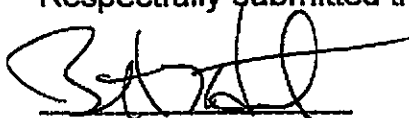
Due to the moderate level of Total Petroleum Hydrocarbons as gasoline (TPH/g) in groundwater grab samples recovered at the former station location, it appears that the either contaminants have migrated on to the subject site from the neighboring site or, there has been a historical fuel release at subject site. A determination of groundwater gradient direction would need to be made in order to ascertain the contaminate source.

PIERS recommends that two wells be installed at the subject site, or the neighboring site to determine groundwater gradient direction.

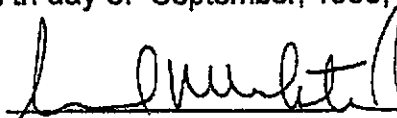
LIMITATIONS

The observations and conclusions presented in this report are professional opinions based on the scope of work outlined herein. This report was prepared in accordance with generally accepted standards of environmental geological practice in California at the time this investigation was performed. The opinions presented apply to site conditions existing at the time of our study and cannot apply to site conditions or changes of which we are not aware or have not had the opportunity to evaluate. This investigation was conducted solely to evaluate environmental conditions of the groundwater with respect to hydrocarbons identified during historic research work. Evaluation of the geologic conditions at the site for the purpose of this investigation is made from a limited number of observation points. Subsurface conditions may vary away from the data points available. Additional work, including subsurface investigation, can reduce the inherent uncertainties associated with this type of investigation. It must be recognized that any conclusions drawn from these data rely on the integrity of the information available at the time of investigation and that a full and complete determination of environmental contamination and risks cannot be made.

Respectfully submitted this 27th day of September, 1999,

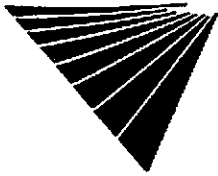


Bennett T. Halsted
Project Manager



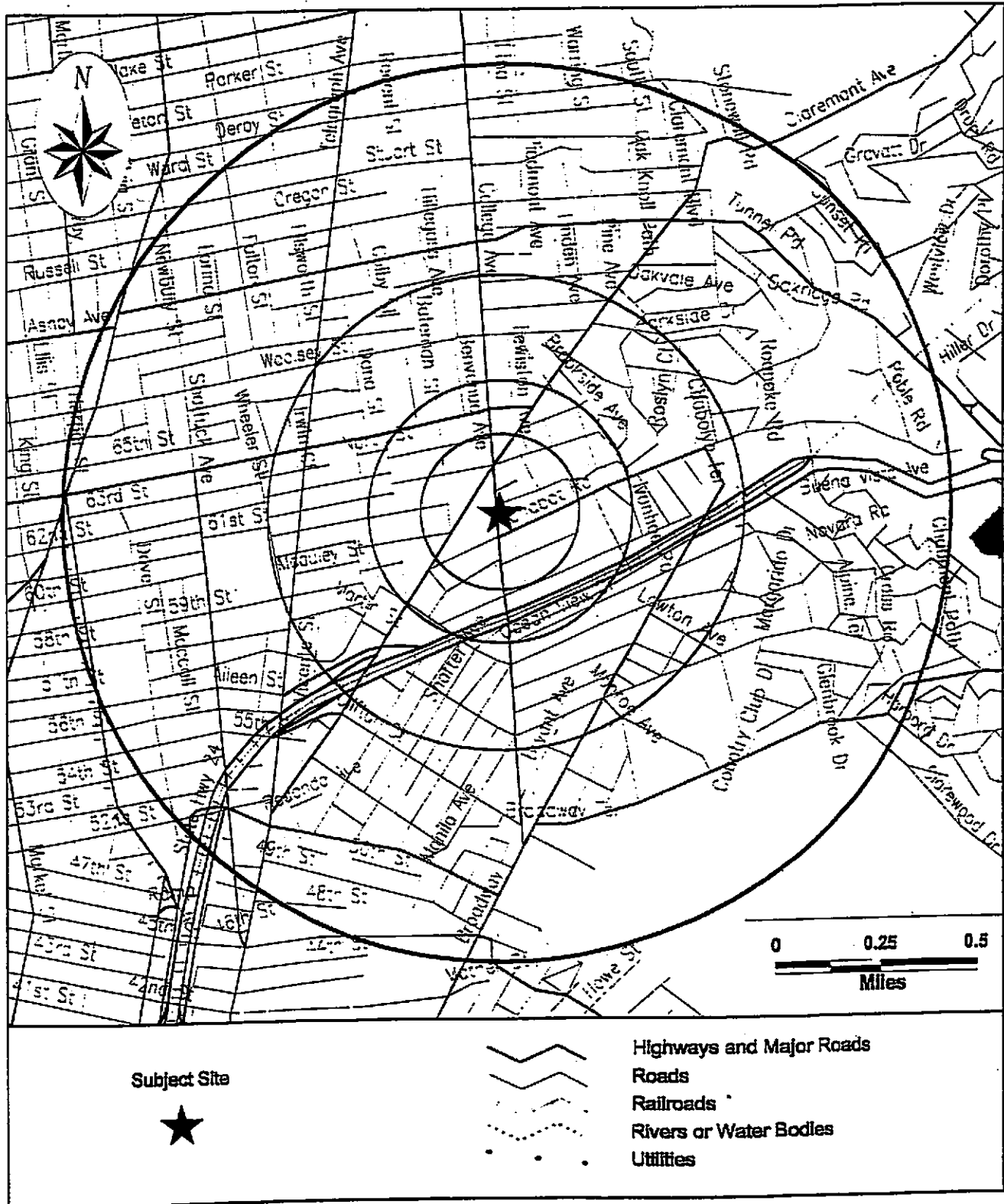
Samuel H. Halsted PE
C.E. 14095

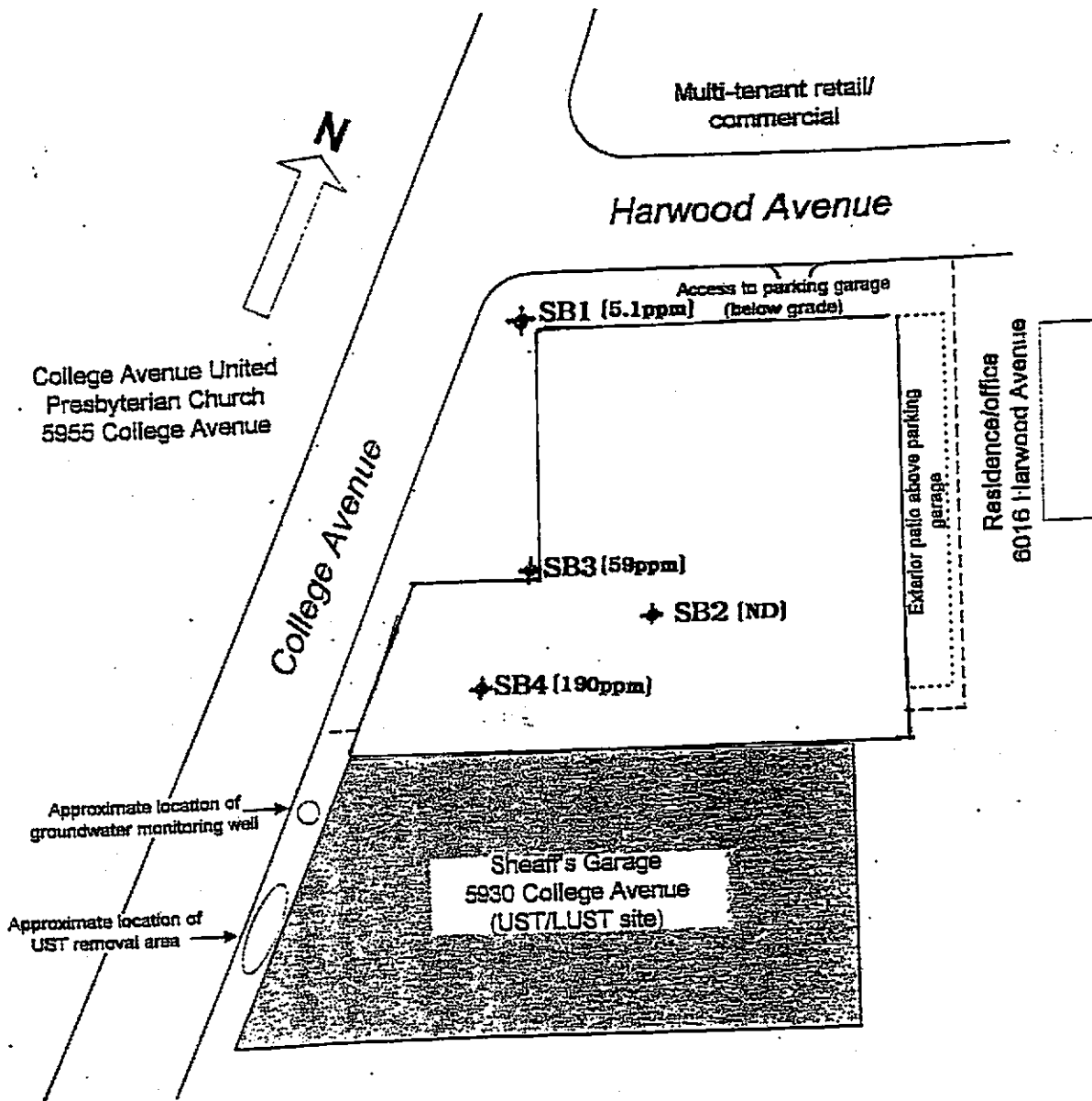
FIGURES



PIERS Environmental Services, Inc.
ASTM E1527-97 Environmental Sites Search

VICINITY MAP





SITE PLAN

5940 COLLEGE AVE., OAKLAND, CA



BORING LOCATION (TPH/g)
in mg/l
(ppm)

SCALE: 1"=40'
DATE: 9/13/99

APPROVED BY:

DRAWN BY:

REVISED

PIERS ENVIRONMENTAL SERVICES, INC.

1330 S. BASCOM AVENUE, SUITE F, SAN JOSE, CA 95128

FIGURE 2

BORING LOGS

PIERS Environmental Services

Exploratory Boring Log

Project No. _____ Client: D. Elwood
 Location: 5947 Calhoun Ave Oakland
 Drilling Method: 3" Hand Auger Permit: N/A

Boring # SB-1 Date 8-31-99
 Logged By: BH
 Page 1 of 1

Sample No.	Blow Count	Sample Type	Location Depth USGS	Lithology Description Detail	H2O	Well Const.
SB-1		Water ∇		concrete w/ 3/4" drain rock		Mark Portland Cement
				Low Plasticity clay, 30-35% silt light brown, med. stiff		
			5'	Silty/Sandy GRAVEL w/ 15% clay Angular, poor sorted slight hydrocarbon odor.		
				Bo H		
			10'			
			15'			
			20'			
			25'			
			30'			
			35'			
			40'			

PIERS Environmental Services

Exploratory Boring Log

Project No. _____ Client: P. Elwood
 Location: 5442 Collegen Ave. Oakland
 Drilling Method: 3" dia. hand auger Permit: A/A

Boring # B-2 Date 8-31-99
 Logged By: BT Page 1 of 1

Sample No.	Blow Count	Sample Type	Location Depth USGS	Lithology Description Detail	H2O	Well Const.
48-2				conc. w/ 3/4" rock grains		Portland Cement
			CL	low Plast. CLAY, light brown. 30% silt med stiff		
			5'			
			CL	same 40% silt.		
			10'			
				Bottom		
			15'			
			20'			
			25'			
			30'			
			35'			
			40'			

water ↓

*Note: Depths calculated from basement floor, approx. 3.5' below sidewalk elevation.

Environmental Restoration Services Exploratory Boring Log

Project No. _____ Client: P. Elwood Boring # EB3 Date 8/3/99
 Location: 5942 College Ave Oakland Logged By: BA
 Drilling Method: 3" Hand Auger Permit: N/A Page 1 of 1

Sample No.	Blow Count	Sample Type	Location Depth USGS	Lithology Description	Well Const.
EB-3		water	0'	Concrete / 3/4" drain Rock	Portland Cement
			1'	low Plast. CLAY, 30-35% silt, light brown. med. stiff	
			5'		
			6'		
			10'	Silty Sandy GRAVEL 15% clay. light greenish grey med. dense. med. hydro carbon odor.	
			15'		
			20'		
			25'		
			30'		
			35'		
40'					

PIERS Environmental Services

Exploratory Boring Log

Project No. _____ Client: P. Elwood
 Location: 5942 College Ave Oakland
 Drilling Method: 3" dia. Hand Auger Permit: N/A

Boring # SB-4 Date 9/1/99
 Logged By: BH Page 1 of 1

Sample No.	Blow Count	Sample Type	Location Depth USGS	Lithology Description Detail	H2O	Well Const.
				concrete/sand/gravel.		
			CL	Low Plasticity CLAY, 30-35% silt, light brown, med. stiff		
			5'			
SB-4		water ▽	9M	Silty GRAVEL, 3% silt w/ 20% clay Med. dense, wet strong Hydrocarbon odor - Bot @ 19 feet		Portland Cement
			10'			
			15'			
			20'			
			25'			
			30'			
			35'			
			40'			

Note: Depths calc. from basement floor, approx. 3.5 feet below sidewalk elevation.

**CHAIN-OF-CUSTODY
ANALYTICAL RESULTS**

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • Telephone: (408) 735-1550 (800) 287-1799 • Fax: (408) 735-1554

Chain of Custody/Analysis Work Order

Client: PIERS
 Address: 1330 S. Bascom #F
San Jose
 Contact: Ben Halsted
 Telephone #: 408-559-1248
 Date Received: 9-2-99
 Turn Around: Norm

Project ID: College
 Purchase Order #:

Sampler/Company: PIERS Telephone #: 408 559-1248
B. Halsted
 Special Instructions/Comments

LAB USE ONLY

Samples arrived chilled and intact:
 Yes No G.G
 Notes: 9/2/99

Sample Information								Requested Analysis									
Lab #	Sample ID	Grab/Composite	Matrix	Date Collected	Time Collected	Pres.	Sample Container	TPH	g	BTX	MTBE						
	SB-1		water	8-31-99	9:28		(2) 40ml VOA	X									16135-001
	SB-2		↓	"	10:16		↓	X									-002
	SB-3		↓	"	1:45		↓	X									-003
	SB-4		↓	9-1-99	11:05 a.m.		(2) 40ml VOA	X									-004
Relinq. By: <u>B. Halsted</u>								Received By:				Date: <u>9-2-99</u>		Time: <u>12:05</u>			
Relinq. By:								Received By: <u>[Signature]</u>				Date: <u>9/2/99</u>		Time: <u>12:05</u>			
Relinq. By:								Received By:				Date:		Time:			

Entech Analytical Labs, Inc.

CA ELAP# I-2346

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Piers Environmental Services
1330 South Bascom Avenue
San Jose, CA 95128
Attn: Ben Halsted

Date: 9/10/99
Date Received: 9/2/99
Project: College
PO #:
Sampled By: Client

Certified Analytical Report

Water Sample Analysis:

Sample ID	SB-1			SB-2			SB-3				
Sample Date	8/31/99			8/31/99			8/31/99				
Sample Time	9:28			10:16			13:45				
Lab #	15135-001			15135-002			15135-003				
	Result	DF	DLR	Result	DF	DLR	Result	DF	DLR	PQL	Method
Results in µg/Liter:											
Analysis Date	9/9/99			9/10/99			9/9/99				
TPH-Gas	5,100	10	500	ND	1.0	50	59,000	50	2500	50	8015M
MTBE	110	10	50	ND	1.0	5.0	650	50	250	5.0	8020
Benzene	43	10	5	ND	1.0	0.50	3,500	50	25	0.50	8020
Toluene	34	10	5	ND	1.0	0.50	310	50	25	0.50	8020
Ethyl Benzene	40	10	5	ND	1.0	0.50	2,000	50	25	0.50	8020
Xylenes (total)	ND	10	5	ND	1.0	0.50	1,900	50	25	0.50	8020

DF=Dilution Factor ND= None Detected above DLR PQL=Practical Quantitation Limit DLR=Detection Reporting Limit

• Report amended 9/10/99

• Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #I-2346)


Michelle L. Anderson, Lab Director

Environmental Analysis Since 1983

Entech Analytical Labs, Inc.

CA ELAP# I-2346

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Piers Environmental Services
1330 South Bascom Avenue
San Jose, CA 95128
Attn: Ben Halsted

Date: 9/10/99
Date Received: 9/2/99
Project: College
PO #:
Sampled By: Client

Certified Analytical Report

Water Sample Analysis:

Sample ID	SB-4										
Sample Date	9/1/99										
Sample Time	11:05										
Lab #	15135-004										
	Result	DF	DLR							PQL	Method
Results in µg/Liter:											
Analysis Date	9/9/99										
TPH-Gas	190,000	200	10000							50	8015M
MTBE	1,100	200	1000							5.0	8020
Benzene	890	200	100							0.50	8020
Toluene	110	200	100							0.50	8020
Ethyl Benzene	4,000	200	100							0.50	8020
Xylenes (total)	7,500	200	100							0.50	8020

DF=Dilution Factor ND=None Detected above DLR PQL=Practical Quantitation Limit DLR=Detection Reporting Limit

Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #I-2346)

ND with 82%
82%


Michelle L. Anderson, Lab Director

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite B • Sunnyvale, CA 94086 • Telephone: (408) 733-1550 (800) 287-1799 • Fax: (408) 733-1554

Chain of Custody/Analysis Work Order

Client: PIERS
 Address: 1330 S Bascom #F
 Contact: San Jose Ben Halsted
 Telephone #: 408-559-1248
 Date Received: 9-2-99
 Turn Around: Normal

Project ID: College
 Purchase Order #:

Sample/Company: PIERS Telephone #: 408-559-1248
B. Halsted
 Special Instructions/Comments

LAB USE ONLY

Samples arrived chilled and intact:
 Yes No G.C.
 Notes: 9/2/99

16135

Sample Information								Requested Analysis								
Lab #	Sample ID	Grab/Composite	Matrix	Date Collected	Time Collected	Pres.	Sample Container	IPM/STER	W/BE	Other						
	SB-1		Water	8-31-99	9:35		24g/1 Jar	X								16135-001
	SB-2		↓	"	10:15		↓	X								-002
	SB-3		↓	"	1:45		↓	X								-003
004	SB-4		↓	9-1-99	11:25		24g/1 Jar	X	X	per B						-004

Relay By: B. Halsted

Received By: [Signature]

Date: 9-2-99 Time: 12:05
 Date: 9/2/99 Time: 12:05

Entech Analytical Labs, Inc.

CA ELAP# I-2346

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Piers Environmental Services
1330 South Bascom Avenue
San Jose, CA 95128
Attn: Ben Halsted

Date: 9/15/99
Date Received: 9/2/99
Project: College
PO #:
Sampled By: Client

Certified Analytical Report

Water Sample Analysis:

Sample ID	SB-4									
Sample Date	8/31/99									
Sample Time	11:05									
Lab #	15135-004									
	Result	DF	DLR						PQL	Method
Results in µg/Liter:										
Analysis Date	9/14/99									
tert-Butanol	ND	50	1000						20	8240
MTBE	ND	50	250						5.0	8240
Diisopropyl ether	ND	50	250						5.0	8240
Ethyl-tert-butyl ether	ND	50	250						5.0	8240
tert-Amylmethyl ether	ND	50	250						5.0	8240

DF=Dilution Factor ND= None Detected above DLR PQL=Practical Quantitation Limit DLR=Detection Reporting Limit

1. Sample diluted due to high concentrations of non-target hydrocarbons
2. Analysis performed by Entech Analytical Labs, Inc. (CA ELAP #I-2346)


Michelle L. Anderson, Lab Director