Converse Environmental Consultants California

101 Howard Street, Suite A
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REPORT - FUEL LEAK ASSESSMENT
E-Z Serve Station No. 1235
525 West A Street
Hayward, California

Prepared for:

E-Z Serve of California
P. O. Box 3550
Ontario, California 91761

March 13, 1987
86-44-361-02

Converse Environmental Consultants California

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Mr. Mike Buckmaster
General Services Manager
E-Z Serve of California
P. O. Box 3550
Ontario, California 91761

Subject: Report - Fuel Leak Assessment
E-Z Serve Station No. 1235
525 West A Street
Hayward, California

Dear Mr. Buckmaster:

Enclosed are five copies of our report which transmits the results of our investigation of soil and groundwater contamination below the E-Z Serve Mobil station at 525 A Street in Hayward, California. The work was performed as per our proposal dated December 5, 1986 and as authorized on December 8. One copy each of this report should be forwarded to ~~Mr. Tom Callaghan~~, RWQCB, and Ms. Suzanne Larson, Hayward Fire Department, as soon as possible.

We thank you for the opportunity to provide our services for this project, and would be pleased to develop a detailed scope of work for the program recommended in Section 8. Should you have any questions, please do not hesitate to call.

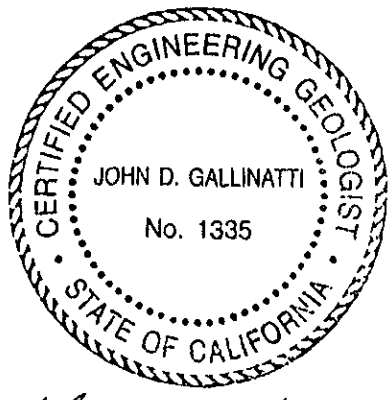
Respectfully submitted,

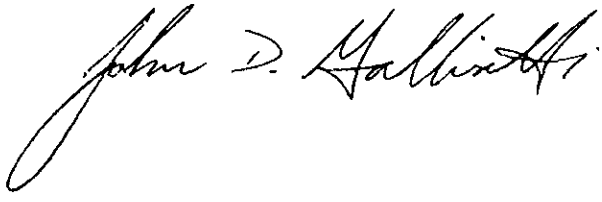
CONVERSE ENVIRONMENTAL CONSULTANTS CALIFORNIA

John D. Gallinatti
Project Geologist
EG 1335

Corey T. Dare
Senior Engineer
CE32948

CTD5:33





PROFESSIONAL CERTIFICATION

REPORT- FUEL LEAK ASSESSMENT
E-Z Serve Station No. 1235
525 West A Street
Hayward, California

March 13, 1987
86-44-361-02

This report has been prepared by the staff of Converse Environmental Consultants California under the supervision of the Engineer and/or Geologist whose seal(s) and signature(s) appear hereon.

The findings, recommendations, specifications or professional opinions are presented, within the limits prescribed by the client, after being prepared in accordance with generally accepted professional engineering and geologic practice. No other warranty is expressed or implied.

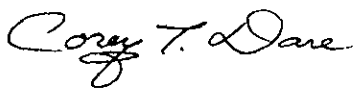


Table of Contents

1. INTRODUCTION

The purpose of thise investigation was to make an initial assessment of the extent of gasoline contamination at the E-Z Serve Mobil Station located at 525 West A Street in Hayward, California (Drawing 1). A fuel system leak was discovered as a result of a discrepancy noticed during inventory reconciliation. A leak in the gasoline product line near the eastern pump island was subsequently discovered by E-Z Serve, and has since been repaired (Drawing 2).

A total of three borings were drilled on the station property. The borings were converted to groundwater monitoring wells. Soil samples recovered during drilling, and water samples obtained from the developed wells were tested by a laboratory for total petroleum hydrocarbons (soil and water) and benzene, toluene and xylene (water only). All data generated during this investigation were compiled, analyzed and evaluated for preparation of this report. The work was performed by Converse Environmental Consultants California (CECC) staff under the direction of Mr. John D. Gallinatti, Certified Engineering Geologist.

2. SITE INVESTIGATION AND WELL INSTALLATION

A total of three borings designated B1 through B3 were drilled on December 16, 1986 at the locations shown on the Site Plan (Drawing 2). Borings B1 and B2 were located approximately 40 feet east and 10 feet northwest of the product line leak, respectively, as indicated in Drawing 2. Boring B3 was located approximately 100 feet west of the product line leak. The borings were drilled to depths of 30 to 31 feet using an 8-inch O.D. hollow-stem auger by Datum Exploration, Inc., and logged by CECC personnel. The augers were steam cleaned prior to use and only used in a single boring. All drill cuttings are stored on site in DOT-approved hazardous waste drums. The drums will remain on site until appropriate disposal is arranged (at a licensed disposal facility, if required).

Soil samples for chemical analysis were taken at five to seven-foot intervals throughout the length of each boring using a 2.5-inch I.D. modified California split-barrel sampler equipped with clean brass sample liners. Before each use, the sampler was cleaned by scrubbing with alconox and rinsing with distilled water. The soil samples were retained in the 6-inch long brass liners, and immediately capped, labelled and sealed upon removal from the sampler. The samples were then packed with reusable refrigerant materials in insulated containers at approximately 4°C, and transported to the laboratory. Prior to testing, the samples were stored in the absence of light under refrigerated conditions.

At the desired total depth for each well, the auger was removed from the boring. Either 4-inch (B2 and B3) or 2-inch (B1) diameter PVC casing and well screen were installed with a sand pack, bentonite, cement grout seal, and metal hole cover. Boring/well logs showing the soils encountered and the well construction schematics are presented in Appendix A as Drawings A1 through A6. Well construction details and an explanation of the Unified Soil Classification System are given in Drawing A7.

The three wells were installed on December 16, 1986, and were developed on January 2, 1987. Water samples were obtained from the wells on January 6 and February 25, and transported to the laboratory for chemical analyses.

3. LABORATORY TESTING

Both soil and water samples recovered from the borings/wells were taken to Kennedy/Jenks/Chilton laboratories in San Francisco for chemical analyses. The samples were transported in accordance with EPA protocol and chain-of-custody procedures. Copies of all analytical results as submitted by the laboratory, plus the chain-of-custody records are included in Appendix B. All recovered soil samples were tested for total petroleum hydrocarbons (TPH) (in mg/kg, wet weight basis) as gasoline and as diesel fuel. Water samples were tested for total petroleum hydrocarbons (in mg/L) as gasoline and diesel fuel, as well as for benzene, toluene and xylene (in ug/L) and conductivity (in umho/cm).

4. SUBSURFACE CONDITIONS

The site lies within the San Leandro Cone, a low-gradient alluvial fan which originates at the mouth of Castro Valley and spreads westward onto the bay plain (DWR, 1967). Although the physiographic feature has an alluvial origin, the underlying sediments were largely deposited in the intertidal zone and predominantly consist of unconsolidated marine clay with some interlayered fine sand (Robinson, 1956, DWR 1963).

The regional hydraulic gradient is expected to be westward, from Castro Valley towards the bay. However, the local gradient may be significantly different than the regional gradient due to:

- drainage towards Sulphur Creek, approximately 1000 feet south of the site;
- drawdown from nearby groundwater wells; and
- local variations in permeability.

Soils encountered in the borings were found to consist of a surficial layer of clay or sandy clay underlain by clayey sand to the depth of the borings (30 to 31 feet). A section through the three borings showing the simplified soil conditions is presented in Drawing 3. The moderately to highly plastic, soft clay layer was found to extend to a depth of about 20 to 25 feet, underlain by more permeable layers of silty to clayey sand. Groundwater was encountered during drilling near the top of the clayey sand, at depths of 20.5 feet (B1 and B2) and 22 feet (B3). Water levels rose in the developed monitoring wells to depths ranging from 16.5 to 16.9 feet (measured on February 25, 1987). Conductivity measured in the water samples was 1200 umhos/cm.

5. SOIL AND WATER CONTAMINATION

Results of the chemical analyses of both soil and water are shown on Drawing 3.

TPH concentrations measured in soil samples from Boring B2 (adjacent to the leak) were significantly greater than concentrations measured in samples in the other two borings. Total petroleum hydrocarbons (TPH) as gasoline reach a peak value of 1200 ppm at a depth of 11 feet in Boring B2. In the same boring, concentrations of 410 ppm, 200 ppm, 80 ppm TPH occur at depths of 6, 16 and 21 feet respectively. The only significant soil contamination in the other two borings occurs within a few feet of the water table (top of the clayey sand). In Boring B1, a composite analysis of samples from depths of 6, 10, and 14 feet detected less than 1 ppm TPH, whereas, close to the top of the clayey sand concentrations of 29 ppm and 15 ppm were detected at 18 and 23 feet respectively. Similarly, in Boring B3, a concentration of 51 ppm was detected in a sample from a depth of 21 feet while samples from 10 and 15 feet had concentrations of less than 0.1 ppm and 7.2 ppm respectively. TPH as diesel was non-detectable in all samples except at a depth of 15 feet in Boring B3.

No measurable free product was observed in any of the water samples. A faint sheen was noticed only on the water sample from B2 taken on January 6, 1987. Concentrations of both TPH and dissolved constituents (benzene, toluene, and xylenes) were much greater in Well B2 than in B1 or B3 (Drawing 3). Concentrations from water samples were as follows:

WATER SAMPLES

	B1	B2	B3
Total Petroleum Hydrocarbons as Gasoline (ppm)	12	51	15
Benzene (ppb)	4130	8800	2900
Toluene (ppb)	2270	9000	1600
Xylenes (ppb)	1710	7700	2200

6. SITE SENSITIVITY

The level of remediation which will be required at the site is dependent on the potential for contamination of potable sources of groundwater. A thorough investigation of this issue was beyond the scope of the present investigation; however, some preliminary observations can be made. Review of the Alameda County well inventory (Alameda County, 1987), indicates that there are six wells within a 1500 foot radius of the site. One well is a recently installed monitoring well across the street from the site, two wells are shallow (29 feet) irrigation wells drilled during the drought of 1977, two are older irrigation wells (60 to 80 feet), and one is a deep domestic well (255 feet). There are an additional 14 wells within a 1/2-mile radius of the site. The potential for aquifer contamination will depend on the location and thickness of aquitards (clay layers) below the site. Although the base of the clayey sand was not penetrated in any of the borings, the nature of the local deposits suggests that another clay layer could be expected within the top fifty feet.

7. EVALUATION AND CONCLUSIONS

The results of this investigation suggest that gasoline from a line leak has created a contaminant plume with a very limited horizontal extent in the upper 20 feet of soil (clay). However, the plume has migrated vertically downward through the clay, leading to contamination of groundwater in an underlying clayey sand layer. Soil and water contamination detected in wells B1 and B3 is believed to be the result of migration through the groundwater below a depth of 20 feet and associated upward migration into a capillary zone above the clayey sand. Some soil contamination detected in B3 may be the result of product migration through the trench backfill for the fuel piping. The extent of off-site contaminant migration through the groundwater has not been determined.

In accordance with the guidelines of the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), the detection of soil contamination levels exceeding 1000 ppm categorizes the site as a "Fuel Case." (RWQCB, 1985a) This categorization requires an abatement of the release (repair has been completed), definition of extent of free product (none found); sampling of water for dissolved constituents (values reported herein); and excavation of soil with concentrations greater than 1000 ppm. All of these items have been met except for the required soil excavation.

The next phase of work will require an assessment of the potential for toxic pollution of potable groundwater sources. This will involve a cooperative effort among E-Z Serve, CECC, and the RWQCB. Based on this assessment, the RWQCB may require remedial action and will set target clean-up levels for any required clean-up operations.

8. RECOMMENDATIONS

We recommend that the site investigation be continued in conjunction with discussions between E-Z Serve, CECC, and the RWQCB. We anticipate that further work will be required to estimate the following:

- the extent of off-site contamination of groundwater,
- the local hydraulic gradient,
- the location and use of nearby groundwater wells, and
- the potential for contamination of potable groundwater.

A program which includes the installation of a limited number of off-site soil borings and monitoring wells, a well inventory, a review of available geologic and hydrogeologic data, and water and soil sampling and analysis should be implemented. This will provide a data base sufficient for the RWQCB and CECC to assess the extent of contamination, assign clean-up levels, and design a cost-effective remedial action plan, if necessary. Due to the potential for continued migration of contaminants, we recommend that this program be carried out as quickly as possible.

9. REFERENCES

1. Alameda County Flood Control and Water Conservation District, 1987, Well Inventory Report and well data.

2. California Department of Water Resources, 1963, Alameda County Investigation, Bulletin #13.

3. California Department of Water Resources, 1967, Evaluation of Ground Water Resources, South Bay, Appendix A: Geology, Bulletin 118-1.

4. California Department of Water Resources, 1968, Evaluation of Groundwater Resources, South Bay, Volume 1: Fremont Study Area, Bulletin 118-1.

5. California Department of Water Resources, 1973, Evaluation of Ground Water Resources: South San Francisco Bay, Volume II: Additional Fremont Study Area, Bulletin #118-1.

6. California Regional Water Qaulity Control Board San Francisco Bay Region (1985a) "Guidelines for Addressing Fuel Leaks", Oakland, 24 pp., attachments.

7. California Regional Water Quality Control Board San Francisco Bay Region (1985b) "Assessment of Contamination from Leaks of Hazardous Materials in the Santa Clara Groundwater Basin, 205j Report", Oakland, 161 pp.

8. Helley, E. J., K. R. Lajoie, W. E. Spangle, M. L. Blair, 1979, Flatland Deposits of the San Francisco Bay Region, U. S. Geological Survey Professional Paper 943.

9. Robinson, G. D. (1956) "Geology of the Hayward Quadrangle, California", U.S.G.S. Quadrangle Map GQ 88.

10. Webster, D. A., 1973, Map showing Areas bordering the Southern Part of San Francisco Bay Where a High Water Table May Adversely Affect Land Use, U.S. Geological Survey Miscellaneous Field Studies Map MF 530.

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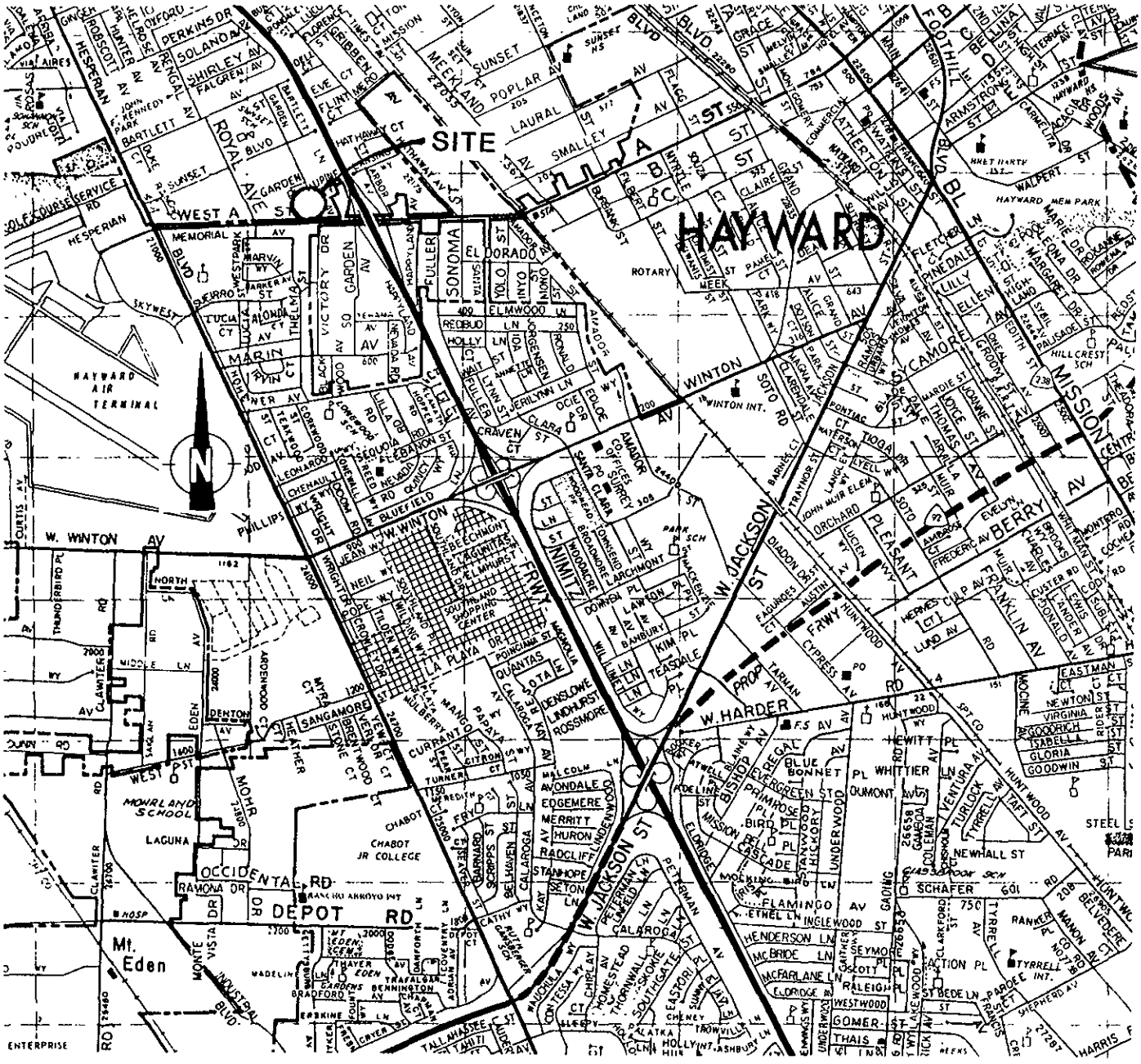


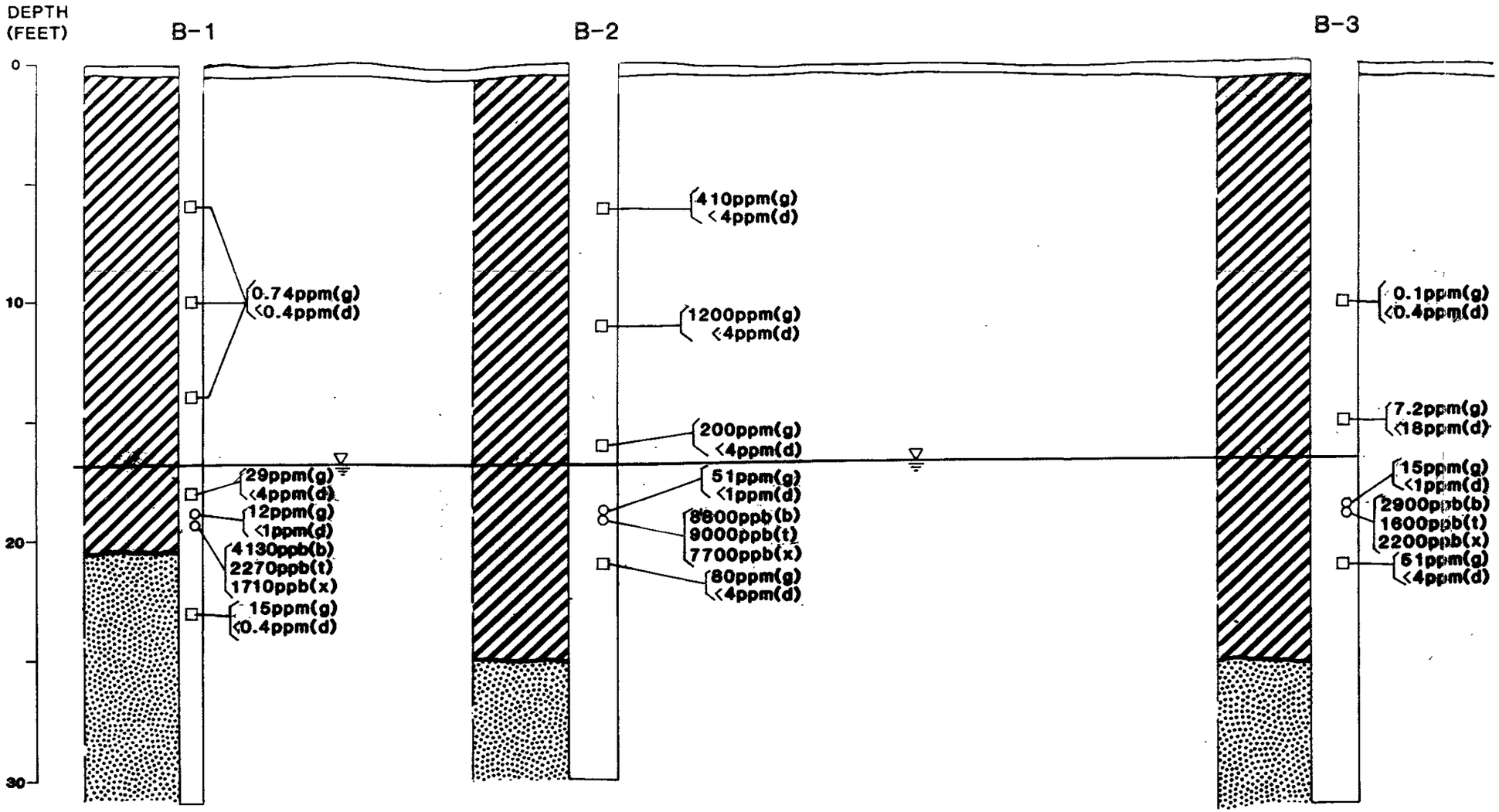
Source: Thomas Brothers Maps
Alameda County, 1972

SITE LOCATION MAP

E-Z SERVE-MOBIL No. 1235
525 West A Street
Hayward, California

Scale: AS SHOWN	Project No.: 86-44-361-02
Prepared by: RRS	Date: 1-13-87
Checked by: JLG	Drawing No.: 1
Approved by:	

Converse Environmental Consultants California
Consulting Engineers and Geologists



VIEW SOUTH

0 10 20 30 FEET

APPROXIMATE SCALE (HORIZONTAL)
VERTICAL SCALE AS SHOWN

EXPLANATION

- □ SOIL SAMPLE
- ○ WATER SAMPLE
- ASPHALT
- CLAY
- CLAYEY SAND
- WATER LEVEL 2/25/87

ppm(g) Total petroleum fuel hydrocarbons quantitated as gasoline, in parts per million.

ppm(d) Total petroleum fuel hydrocarbons in water sample, quantitated as diesel fuel, in parts per million.

ppb(b) Benzene, in parts per billion.

ppb(t) Toluene, in parts per billion

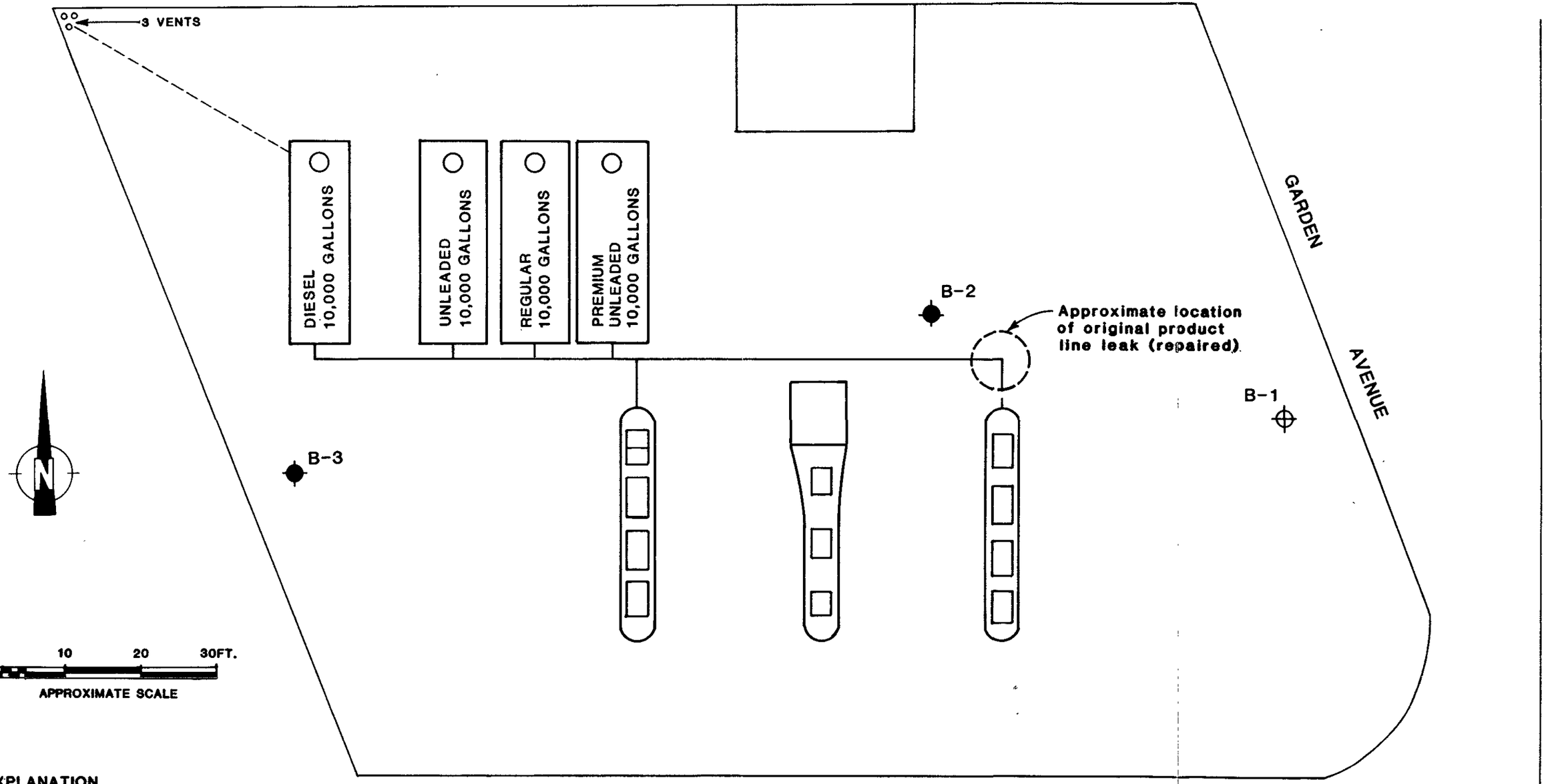
ppb(x) Xylene, in parts per billion.

CROSS SECTION OF SOIL BORINGS SHOWING CONTAMINANT LEVELS IN SOIL AND GROUNDWATER

E-Z SERVE-MOBIL Oil No. 1235
525 West A Street
Hayward, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	3-9-87
Prepared By	RRS
Checked By	MM
Approved By	JDG
Project No.	86-44-361-02
Drawing No.	3



EXPLANATION

- **Ground Water Monitoring Well 2" Diameter**
- **Ground Water Monitoring Well-4" Diameter**

Estimated elevation 45 feet above mean sea level.

Estimated Water Gradient is westward direction.

SITE PLAN

E-Z SERVE-MOBIL No. 1235
525 West A Street
Hayward, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	1-13-87
Prepared By	RRS
Checked By	JLG
Approved By	JDG
Project No	86-44-361-02
Drawing No	2

LOG OF BORING NO. B1

DATE DRILLED: 12/16/86

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED

ELEVATION: 45' EQUIPMENT: 8" Hollow Stem Auger

DEPTH m.	DEPTH ft.	SAMPLES	SYMBOL					WELL CONSTRUCTION	WATER LEVEL	TOTAL HYDROCARBONS mg/kg	TESTS	
				—	—	—	ASPHALT 6"					
				slightly moist	soft	dark brown	SANDY CLAY CL					
1												
	5	D1		moist	soft to medium	medium to light brown	CLAY CH				0.74 <0.4	9* d*
2							increasing sand content to 10'±					
3	10	D2									0.74 <0.4	g* d*
					soft	light olive brown	trace fine sand					
4		D3									0.74 <0.4	g* d*
	15											
5		D4					increasing stiffness			2-25	29 <4	g d
					medium	mottled lt. brn. and mod. olive brn.						
6	20											

E-Z SERVE MOBIL NO. 1235
525 West A Street
Hayward, California

Converse Environmental Consultants California — Consulting Engineers and Geologists

Scale: None	Project No.: 86-44-361-02
Prepared by: SR	Date: 1/13/87
Checked by:	Drawing No.: A-1
Approved by: JDG	

DATE DRILLED: 12/16/86

LOG OF BORING NO. B1 (cont.)

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION: 45' EQUIPMENT: 10" Hollow Stem Auger

DEPTH m.	DEPTH ft.	SAMPLES	SYMBOL					WELL CONSTRUCTION	WATER LEVEL	TOTAL HYDROCARBONS mg/kg	TESTS	
				moist	medium	lt. bn.	CLAY CH					
				wet	loose to med. dense	light brown	CLAYEY SAND SC (slight odor)				15 <0.4	g d
7	25	D5										
8												
9	30	P		wet	loose	medium brown	SILTY SAND SM (No Odor) N=6					
							Bottom of Boring 31'0"					
10	35											
11												
12	40											

E-Z SERVE MOBIL NO. 1235
525 West A Street
Hayward, California

Converse Environmental Consultants California — Consulting Engineers and Geologists

Scale: None	Project No.: 86-44-361-02
Prepared by: SR	Date: 1/13/87
Checked by:	Drawing No.: A-2
Approved by: JDG	

DATE DRILLED: 12/16/86

LOG OF BORING NO. B2

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION: 45' EQUIPMENT: 10" Hollow Stem Auger

DEPTH m	DEPTH ft	SAMPLES	SYMBOL					WELL CONSTRUCTION	WATER LEVEL	TOTAL HYDROCARBONS mg/kg	TESTS	
				—	—	—	ASPHALT 6"					
				slightly moist	soft	dark brown	SANDY CLAY trace fine gravel (slight to moderate Odor) CL					
	5	D1		moist	soft to medium stiff	dark brown	CLAY (Moderate Odor) CH				410 <4	g d
						dark green-ish gray						
	10	D2			soft		(Strong odor)				1200 <4	g d
	15	D3			medium	medium brown	trace of fine sand (Moderate-slight odor)				200 <4	g d
	20								2-25			

E-Z SERVE MOBIL NO. 1235
525 West A Street
Hayward, California

Converse Environmental Consultants California — Consulting Engineers and Geologists

Scale: None	Project No.: 86-44-361-02
Prepared by: SR	Date: 1/13/87
Checked by:	Drawing No.: A-3
Approved by: JDG	

DATE DRILLED: 12/16/86

LOG OF BORING NO. B2 (cont.)

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION: 45' EQUIPMENT: 10" Hollow Stem Auger

DEPTH m.	DEPTH ft.	SAMPLES	SYMBOL						WELL CONSTRUCTION	WATER LEVEL	HYDROCARBONS mg/kg	TOTAL	TESTS
		D4		wet	medium	medium brown	SANDY CLAY trace minor fine sand (Very Slight Odor)	CL			▽	80	g
7												<4	d
	25	P		wet	stiff	medium brown	SANDY CLAY/ CLAYEY SAND (No Odor)	CL/SC N=10					
8													
		P			very stiff		(No Odor)	N=22					
9	30						Bottom of Boring 30'4"						
10													
	35												
11													
12	40												

E-Z SERVE MOBIL NO. 1235
525 West A Street
Hayward, California

Converse Environmental Consultants California — Consulting Engineers and Geologists

Scale: None	Project No.: 86-44-361-02
Prepared by: SR	Date: 1/13/87
Checked by:	Drawing No.: A-4
Approved by: JDK	

LOG OF BORING NO. B3

DATE DRILLED: 12/16/86

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION: 45' EQUIPMENT: 10" Hollow Stem Auger

DEPTH m.	DEPTH ft.	SAMPLES	SYMBOL					WELL CONSTRUCTION	WATER LEVEL	TOTAL HYDROCARBONS mg/kg	TESTS	
				—	—	—	ASPHALT 6"					
				dry	soft	dark brown	SANDY CLAY (No Odor) CL					
1	5											
2				slightly moist	soft	gray	SANDY CLAY (Faint Odor) CH					
		D1		moist	medium	dark gray	(Faint Odor)				<0.1 <0.1	g d
3	10											
				moist	soft	gray	CLAY (Moderate Odor) CH					
4												
	15	D2									7.2 18	g d
5										2-25		
6	20											

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Converse Environmental Consultants California — Consulting Engineers and Geologists

Scale: None	Project No.: 86-44-361-02
Prepared by: SR	Date: 1/13/87
Checked by:	Drawing No.: A-5
Approved by: JDG	

DATE DRILLED: 12/16/86

LOG OF BORING NO. B3(cont.)

THIS SUMMARY APPLIES ONLY AT THE LOCATION OF THIS BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THIS LOCATION WITH THE PASSAGE OF TIME. THE DATA PRESENTED IS A SIMPLIFICATION OF ACTUAL CONDITIONS ENCOUNTERED.

ELEVATION: 45' EQUIPMENT: 10" Hollow Stem Auger

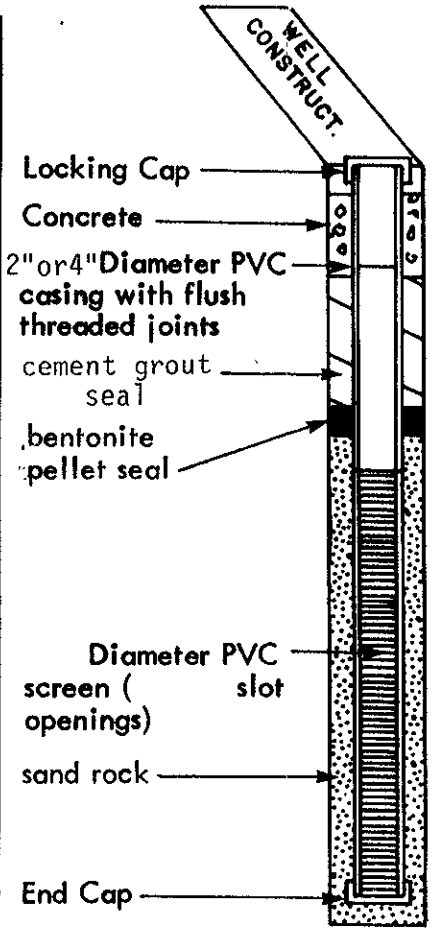
DEPTH m.	DEPTH ft.	SAMPLES	SYMBOL						WELL CONSTRUCTION	WATER LEVEL	TOTAL HYDROCARBONS mg/kg	TESTS	
		D3		moist	medium	M. brown	CLAY (Moderate Odor)	CH				51	g
				wet						▽		<4	d
7	25	P		wet	loose	M. brown	CLAYEY SAND (Faint Odor)	SC N=7					
8													
9	30	P		wet	stiff	light brown	CLAYEY SILT with v. stiff clay lense (No Odor)	ML N=13					
10													
	35												
11													
12	40												

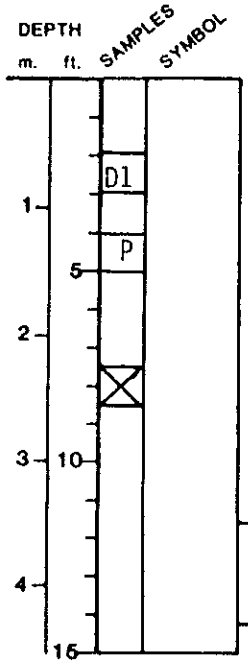
E-Z SERVE MOBIL NO. 1235
525 West A Street
Hayward, California

Converse Environmental Consultants California — Consulting Engineers and Geologists

Scale	None
Project No	86-44-161-02
Prepared by	SR
Date	1/13/87
Checked by	
Drawing No.	A-6
Approved by	

MAJOR DIVISIONS			SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS More than half is larger than No. 200 sieve	GRAVELS More than half coarse fraction is larger than No. 4 sieve	Clean gravels with little or no fines	GW	Well graded gravels, gravel - sand mixtures
			GP	Poorly graded gravels, gravel - sand mixtures
		Gravels with over 12% fines	GM	Silty gravels, poorly graded gravel - sand - silt mixtures
			GC	Clayey gravels, poorly graded gravel - sand - clay mixtures
	SANDS More than half coarse fraction is smaller than No. 4 sieve	Clean sands with little or no fines	SW	Well graded sands, gravelly sands
			SP	Poorly graded sands, gravelly sands
		Sands with over 12% fines	SM	Silty sands, poorly graded sand - silt mixtures
			SC	Clayey sands, poorly graded sand - clay mixtures
FINE GRAINED SOILS > half is smaller than No. 200 sieve	SILTS AND CLAYS Liquid limit less than 50		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic clays and organic silty clays of low plasticity
	SILTS AND CLAYS Liquid limit greater than 50		MH	Inorganic silts, micaceous or diatomaceous fine, sandy or silty soils, elastic silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils





SAMPLE TYPE

DRIVE SAMPLE, 2.5" ID Sampler, driven with 140 lb. weight, 30" drop

STANDARD PENETRATION TEST
1.4" ID Sampler, driven with 140lb. weight, 30" drop

NO RECOVERY

Water level at time of drilling

Stabilized water level on date noted

TEST TYPE

	TESTS
CLASSIFICATION	
Plasticity	pi
Grain Size Analysis	ma
Specific Gravity	sg
Shrink/Swell	s/s
STRENGTH	
Direct Shear	ds
Unconfined Compression	uc
Triaxial Compression	tx
Vane Shear	vs
CONSOLIDATION	
DYNAMIC TESTS	
Cyclic Triaxial Compression	ctx
CHEMICAL	
Total Petroleum Hydrocarbons: as gasoline	g
as diesel	d
*=test result from composite sample	

UNIFIED SOIL CLASSIFICATION SYSTEM AND BORING LOG SYMBOLS

E-Z SERVE MOBIL NO. 1235
525 West A Street
Hayward, California

Project No.
86-44-361-02

Converse Environmental Consultants California
Geotechnical Engineering and Applied Sciences

Drawing No.
A-7

Soil Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco California 94105
415 362 6065

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868604-606
Source	Soil I.D.:	Composite B-1, D-1 (6 ft) B-1, D-2 (10 ft) B-1, D-3 (14 ft)
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	0.74
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<0.4

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference: "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div. 4".

Analyst KA Manager Leverett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton

Laboratory Division
657 Howard Street
San Francisco, California 94105
415 362 6065

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868607
Source	Soil I.D.:	B-1, D-4
	Depth:	18 ft
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	29
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<4

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference. "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW–846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div. 4".

Analyst KA Manager Leverett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton

Laboratory Division
657 Howard Street
San Francisco, California 94105
415 362 6065

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868608
Source	Soil I.D.:	B-1, D-5
	Depth:	23 ft
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	15
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<0.4

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference: "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div 4".

Analyst KA Manager Leverett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco California 94105
415 362 6065

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868609
Source	Soil I.D.:	B-2, D-1
	Depth:	6 ft
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	410
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<4

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference: "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div. 4".

Analyst KA Manager Leverett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415 362 6065

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868610
Source	Soil I.D.:	B-2, D-2
	Depth:	11 ft
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	1200
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<4

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference "Test Methods for Evaluating Solid Waste -- Physical/Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div. 4".

Analyst KA Manager Leverett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton

Laboratory Division
657 Howard Street
San Francisco California 94105
415 362 6065

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868611
Source	Soil I.D.:	B-2, D-3
	Depth:	16 ft
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	200
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<4

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div 4".

Analyst KA Manager Leverett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415 362 6065

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868612
Source	Soil I.D.:	B-2, D-4
	Depth:	21 ft
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	80
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<4

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div 4".

Analyst KA Manager Leverett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415 362 6065

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.	868613
Source	Soil I.D.: B-3, D-1 Depth: 10 ft
	Converse Proj. EZS 86-44-361-02
Date Collected	12/16/86
Time Collected	-
Collected by	Converse Consultants personnel

Analysis	Units		Replicate	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	<0.1	<0.1	Spike recovery 87%
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<0.4	<0.4	Spike recovery 66%

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW–846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div 4".

Analyst KA Manager Leverett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton

Laboratory Division
657 Howard Street
San Francisco, California 94105
415 362 6065

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868614
Source	Soil I.D.:	B-3, D-2
	Depth:	15 ft
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	7.2
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	18

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW-846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div. 4".

Analyst KA Manager Leverett R. Smith

Soil Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco California 94105
415 362 6065

For	Converse Consultants	Received	12/18/86
Attention	Mr. Ryan Tully	Reported	12/24/86
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.		868615
Source	Soil I.D.:	B-3, D-3
	Depth:	21 ft
Converse Proj. EZS 86-44-361-02		
Date Collected		12/16/86
Time Collected		-
Collected by		Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as gasoline)	mg/kg	51
Total Petroleum Hydrocarbons (as diesel fuel)	mg/kg	<4

Comments: Analysis of pentane extract by gas chromatography with flame ionization detection, using commercial fuel samples as comparison standards. Results reported in milligrams per kilogram, wet (as received) weight basis.

Reference: "Test Methods for Evaluating Solid Waste – Physical/Chemical Methods", SW–846, Second Edition (Revised 1984), and "California Administrative Code Title 22, Div 4".

Analyst KA Manager Leverett R. Smith

Kennedy/Jenks/Chilton

Laboratory Division
657 Howard Street
San Francisco, California 94105
415-362-6065

Water Analysis Report

For	Converse Consultants	Received	1/6/87
Attention	Ryan Tully	Reported	1/16/87
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.	87118
Source EZS - Hayward Converse Proj. No. 86-44-361-01	Water I.D.: WS1-1 Depth: 2 ft below surface
Date Collected	1/6/87
Time Collected	1350
Collected by	Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as Gasoline)	mg/L	12
Total Petroleum Hydrocarbons (as diesel fuel)	mg/L	<1

Comments:
Analysis of pentane extract by capillary gas chromatography, using flame ionization detection. Commercial fuel samples used as comparison standards. Results reported in milligrams per liter.

Analyst KA Manager Leverett R. Smith

Kennedy/Jenks/Chilton

Laboratory Division
657 Howard Street
San Francisco, California 94105
415-362-6065

Water Analysis Report

For	Converse Consultants	Received	1/6/87
Attention	Ryan Tully	Reported	1/16/87
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.	87120
Source EZS - Hayward Converse Proj. No. 86-44-361-01	Water I.D.: WS2-1 Depth: 2 ft below surface
Date Collected	1/6/87
Time Collected	1350
Collected by	Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as Gasoline)	mg/L	51
Total Petroleum Hydrocarbons (as diesel fuel)	mg/L	<1

Comments:
Analysis of pentane extract by capillary gas chromatography, using flame ionization detection. Commercial fuel samples used as comparison standards. Results reported in milligrams per liter.

Analyst KA Manager Everett R. Smith

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415-362-6065

Water Analysis Report

For	Converse Consultants	Received	1/6/87
Attention	Ryan Tully	Reported	1/16/87
Address	The Folger Bldg., Suite A 101 Howard Street, San Francisco, CA 94105		

Lab. No.	87123
Source EZS - Hayward Converse Proj. No. 86-44-361-01	Water I.D.: WS3-1 Depth: 2 ft below surface
Date Collected	1/6/87
Time Collected	1350
Collected by	Converse Consultants personnel

Analysis	Units	Analytical Results
Total Petroleum Fuel Hydrocarbons (as Gasoline)	mg/L	15
Total Petroleum Hydrocarbons (as diesel fuel)	mg/L	<1

Comments:
Analysis of pentane extract by capillary gas chromatography, using flame ionization detection. Commercial fuel samples used as comparison standards. Results reported in milligrams per liter.

Analyst KA Manager Leverett R. Smith

Water Analysis Report

Kennedy/Jenks/Chilton

Laboratory Division
657 Howard Street
San Francisco, California 94105
415-362-6065

For Converse Consultants
Attention Mr. Ryan Tully
Address The Folger Bldg., Suite A
101 Howard Street, San Francisco, CA 94105

Received 2/25/87
Reported 3/2/87

Lab. No. 871181

Source EZS Hayward
Converse Proj. No.
86-44-361-01

Station No.: MW1-2

Date Collected 2/25/87

Time Collected 1205

Collected by Converse Consultants personnel

Analysis	Units		Replicate	Analytical Results
Benzene	ug/L	4130	4100	Spike recovery 94%
Toluene	ug/L	2270	2230	Spike recovery 91%
Xylenes	ug/L	1710	1660	

Comments:

Analysis by EPA Method 602. Results reported in micrograms per liter.

Analysis by: "Standard Methods for the Examination of Water and Wastewater", Current Edition, APHA.

Analyst SL Manager Leverett R. Smith

Water Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415-362-6065

For Converse Consultants
Attention Mr. Ryan Tully
Address The Folger Bldg., Suite A
101 Howard Street, San Francisco, CA 94105

Received 2/25/87
Reported 3/2/87

Lab. No. 871182

Source EZS Hayward
Converse Proj. No. 86-44-361-01
Station No.: MW2-1

Date Collected 2/25/87

Time Collected 1400

Collected by Converse Consultants personnel

Analysis	Units	Analytical Results
Benzene	ug/L	8800
Toluene	ug/L	9000
Xylenes	ug/L	7700

Comments:

Analysis by EPA Method 602. Results reported in micrograms per liter.

Analysis by: "Standard Methods for the Examination of Water and Wastewater", Current Edition, APHA.

Analyst SL Manager Leverett R. Smith

Water Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415-362-6065

For Converse Consultants
Attention Mr. Ryan Tully
Address The Folger Bldg., Suite A
101 Howard Street, San Francisco, CA 94105

Received 2/25/87
Reported 3/2/87

Lab. No.	871183
Source	EZS Hayward Converse Proj. No. 86-44-361-01
Station No.:	MW3-1
Date Collected	2/25/87
Time Collected	1310
Collected by	Converse Consultants personnel

Analysis	Units	Analytical Results
Benzene	ug/L	2900
Toluene	ug/L	1600
Xylenes	ug/L	2200

Comments:

Analysis by EPA Method 602. Results reported in micrograms per liter.

Analysis by: "Standard Methods for the Examination of Water and Wastewater", Current Edition, APHA.

Analyst SL Manager Leverett R. Smith

Water Analysis Report

Kennedy/Jenks/Chilton
Laboratory Division
657 Howard Street
San Francisco, California 94105
415-362-6065

For Converse Consultants
Attention Mr. John Gallinatti
Address The Folger Bldg., Suite A
101 Howard Street, San Francisco, CA 94105

Received 2/25/87
Reported 3/11/87

Lab. No.	871181-3
Source EZS Hayward Converse Proj. No. 86-44-361-01	Sample I.D.: MW-1, MW-2 and MW-3
Date Collected	2/25/87
Time Collected	-
Collected by	Converse Consultants personnel

Analysis	Units	Analytical Results
Conductivity @ 25°C	micromhos/cm	1,200

Comments:

Authorization by: Mr. John Gallinatti on 3/4/87.

Analysis by: "Standard Methods for the Examination of Water and Wastewater", Current Edition, APHA.

Analyst GB Manager Everett R. Smith

Converse Consultants

CHAIN OF CUSTODY RECORD

Project No.	Project Name
86-44-361-02	EZS

Samplers: (signature) Andrew R...

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	TPH	Remarks
B-1	12/18/86			X	Sample 1 @ 6ft.	✓		
				X	2 @ 10ft	✓		Composite - TPH
				X	3 @ 14 ft	✓		
				X	4 @ 18ft.	✓	X	
				X	5 @ 23ft	✓	X	
B2				X	Sample 1 @ 6ft	✓	X	
				X	2 @ 11ft	✓	X	
				X	3 @ 16ft	✓	X	
				X	4 @ 21ft	✓	X	
B3				X	Sample 1 @ 10ft	✓	X	
				X	2 @ 15ft		X	
				X	3 @ 21ft	✓	X	

Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
	/	12/18/86		/	
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
	/			/	
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
	/			/	
Method of Shipment		Shipped by: (signature)	Courier from Airport: (signature)	Received for Laboratory: (signature)	Date/Time
					/

Converse Consultants

CHAIN OF CUSTODY RECORD

Project No.	Project Name
86-44-361-01	EZS - Hayward

Samplers: (signature) Matt Manthou

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	Total Petroleum Hydrocarbons						Remarks
WS1-1	1/6/87	1.50			2' below surface	1	✓						
WS1-2	1/6/87	1.50			"	1							
					"								
WS2-1	1/6/87	1.50			"	1	✓						
WS2-2	1/6/87	1.50			"	1							
WS2-3	1/6/87	1.50			"	1							
					"								
WS3-1	1/6/87	1.50			"	1	✓						
WS3-2	1/6/87	1.50			"	1							

Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Matt Manthou	1/6/87 2.00	Dave Kane 1/6/87 2.02			
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
Method of Shipment		Shipped by: (signature)	Courier from Airport: (signature)	Received for Laboratory: (signature)	Date/Time

Converse Consultants

CHAIN OF CUSTODY RECORD

Project No.	Project Name
8644 361-01	EZS - Hayward

Samplers: (signature) Matt Kramer

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	BTX - PPB						Remarks
MW-1	2/25/87	12.05			MW-1	3	✓						40 ml VOC bottle
	~~2/25/87~~												
MW-2	2/25	2.05			MW-2	3	✓						"
MW-3	2/25	1.10			MW-3	3	✓						"

Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Matt Kramer	2/25/87 13.15	Norm Barnes K/J/C		|	
Relinquished by: (signature)	Date/Time |	Received by: (signature)	Relinquished by: (signature)	Date/Time |	Received by: (signature)
Relinquished by Courier: (signature)	Date/Time |	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time |	Received by Courier: (signature)
Method of Shipment		Shipped by: (signature)	Courier from Airport: (signature)	Received for Laboratory: (signature)	Date/Time |