

3330 Data Drive Rancho Cordova, CA 95670 916/638-2085 FAX:916/638-8385

August 23, 1989

Mr. Dennis Byrne Hazardous Materials Division Alameda County Environmental Health Services 80 Swan Way, Room 200 Oakland, California 94621

Subject:

Phase I Hydrogeologic Assessment Report

Shell Oil Company 3420 San Pablo Avenue Oakland, California

Delta Project No. 40-88-666

Dear Mr. Byrne:

On behalf of Shell Oil Company, I have enclosed the subject report for your review. In order to further define the extent of hydrocarbon constituents in the soil and ground water at the site, Delta Environmental Consultants, Inc. (Delta), would like to implement the recommendations in the report as soon as approval is obtained from your office.

If you have any questions about the report or the project in general, please contact me at (916) 638-2085.

Sincerely,

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Danell Mation

Darrell L. Nations Sr. Hydrogeologist/Project Manager

DLN:law Enclosure

cc/enc: Ms. Lisa McCann, California Regional Water Quality Control Board
San Francisco Bay Region

Ms. Diane Lundquist, Shell Oil Company

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# PHASE I HYDROGEOLOGIC ASSESSMENT REPORT

3420 SAN PABLO AVENUE OAKLAND, CALIFORNIA DELTA PROJECT NO. 40-88-666

Delta Environmental Consultants, Inc.

# Sample Identification/Field Chain of Custody Record

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# PHASE I HYDROGEOLOGIC ASSESSMENT REPORT

3420 SAN PABLO AVENUE OAKLAND, CALIFORNIA DELTA PROJECT NO. 40-88-666

#### Prepared by:

Delta Environmental Consultants, Inc. 11030 White Rock Road, Suite 110 Rancho Cordova, California 95670 (916) 638-2085

August 22, 1989

# Sample Identification/Field Chain of Custody Record

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## **Appendices**

APPENDIX APPENDIX	A Soil Boring Logs B Monitoring Well Construction Diagrams
APPENDIX	C Slug Test Results D Laboratory Reports

#### TOTAL VOLATILE HYDROCARBON MATRIX SPIKE REPORT EPA METHOD 8015

Sample I.D. : 1859 B-5-1,2,3

Anametrix I.D. : 8800086-01

: SOIL

Matrix : SOIL Date sampled : 08-09-88

Analyst : mk Supervisor : 5.7

Date analyzed: 08-15-88

Date Released : 08-16-88

COMPOUND	SPIKE AMT. (ug/Kg)	MS (ug/Kg)	%REC MS	MSD (ug/Kg)	*REC MSD	RPD .	%REC LIMITS
Sasoline	10000	10000	100%	9500	95%	-5%	50-150

Limits established by Anametrix, Inc.

Page 3 of 3.

#### PHASE I HYDROGEOLOGIC ASSESSMENT REPORT

# 3420 SAN PABLO AVENUE OAKLAND, CALIFORNIA DELTA PROJECT NO. 40-88-666

#### 1.0 INTRODUCTION

Delta Environmental Consultants, Inc. (Delta), has been authorized by Shell Oil Company (Shell) to conduct a Phase I Hydrogeologic Assessment Investigation at the Shell Station located at 3420 San Pablo Avenue, in Oakland, California (site) (Figure 1). Delta's investigation was prompted by a soil investigation conducted at the site in August 1988 by Ensco Environmental Services, Inc. The soil investigation identified the presence of petroleum constituents in the soils at the site.

#### 1.1 Purpose

The purpose of the Phase I Hydrogeologic Assessment Investigation is to determine the lateral and vertical extent of petroleum constituents in the soils of the site, to determine the extent (if any) that petroleum constituents may have affected ground water at the site, and to make recommendations on future investigative and/or remedial activities to be carried out at the site.

#### 1.2 Scope of Work

Activities that have been carried out in order to achieve the purpose of the investigation have included the following:

- Review available geologic and hydrogeologic data pertinent to the site.
- Drill four standard-penetration, hollow-stem-auger soil borings.
- Classify soils according to the Unified Soil Classification System (USCS).
- Complete each soil boring as a monitoring well.
- Screen soil samples with a portable photoionization detector for total organic vapors.
- Select soil samples from each boring according to soil-screening results for submittal to a California-certified laboratory to be analyzed for ethylene dibromide (EDB), 1,2dichloroethane (EDC), benzene, toluene, ethylbenzene, xylenes (BTEX), and purgeable hydrocarbons (TPH) by U. S. Environmental Protection Agency (EPA) Method 8240 and total lead by Solid Waste Method 7421.

# ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 1859 B-5-(1-3)COMP.

Anametrix I.D. : 8808086-01

Matrix : SOIL

Analyst

: mt

Supervisor

: ॐ5

Date sampled: 08-09-88 Date anl. TVH: 08-15-88

Date released : 08-18-88

Date ext. TEH: NA

Date ext. TOG : NA

Date anl. TEH: NA

Date anl. TOG : NA

CAS #	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)	İ
	TVH as Gasoline	5000	BRL	       
1	T .			

BRL - Below reporting limit.

TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with

either headspace or purge and trap.

TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015

with direct injection.

TOG - Total Oil & Grease is determined by Standard Method 503E.

BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by

modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

Page 2 of 3.

- Properly develop the monitoring wells and collect water samples from each well for submittal to a California-certified laboratory to be analyzed for EDB, EDC, BTEX, and TPH by EPA Method 524.2.
- Conduct slug tests in all monitoring wells to evaluate hydraulic conductivity.
- Prepare this report of our finding and make recommendations regarding future assessment and/or remedial activities at the site.

#### 2.0 SITE SOILS AND GEOLOGY

The surface of the site consists of a 2-inch-thick layer of asphalt immediately underlain by a 6-inch-thick aggregate base. The site is covered everywhere by asphalt with the exception of the area immediately overlying the underground storage tanks (USTs) which is covered by a 2- to 4-inch-thick layer of concrete.

Subsurface geology at the site has been inferred from soil borings drilled in August 1988 by Ensco Environmental Services, Inc. (Ensco), and April 1989 by Delta. These borings show that immediately beneath the aggregate base the site is underlain everywhere by a clay stratum which is dark gray in color, highly plastic, and contains little or no sand. This uppermost clay stratum varies in thickness from about 4 to 11 feet across the site. The uppermost clay stratum is underlain by a stratum of sandy/silty clay which is greenish gray in color, moderately plastic, and contains some gravel near the base. This sandy/silty clay unit ranges from about 19 to 22 feet in thickness. Everywhere that borings have penetrated to sufficient depth, a gravelly sand stratum has been encountered beneath the sandy/silty clay. This unit consists of a very coarse sand, brown in color, which contains gravel ranging in size from 0.25 to 0.5 inch. The maximum penetrated depth of this unit has been 6.5 feet.

Soil cross-sections have been constructed to illustrate inferred subsurface relationships at the site. The cross-sections locations are illustrated in Figure 2 and cross-sections A-A' and B-B' are presented in Figures 3 and 4. Soil boring logs are presented in Appendix A.

#### 3.0 SITE HYDROGEOLOGY

Four monitoring wells (MW-1, MW-2, MW-3, and MW-4) were completed at the site on April 10 and 11, 1989. The locations of these wells are shown in Figure 2. Monitoring wells MW-1, MW-3, and MW-4 were completed at depths ranging from 25 to 27.5 feet beneath the surface. These wells were screened across a silty clay and gravelly sand. The gravelly sand was penetrated near the base

# ANAMETRIX, INC.

LABORATORY SERVICES

ENVIRONMENTAL . ANALYTICAL CHE

1961 CONCOURSE DR. SUITE E • SAN JOSE (+ +131)

TEL (405 432-8192 + FAX: (408) 431

Dave Blunt Ensco/Exceltech 41674 Christy Street Fremont, CA 94538-3114 Ligust 18, 1988
Wirk Order Number 8808086
Late Received 08/11/88
Project No. 1859

Dear Mr. Blunt:

One soil sample was received for analysis of total volatile hydrocarbons as gasoline by gas chromatography, using the following EPA method(s):

ANAMETRIX I.D.

SAMPLE I.D.

METHOD(S)

8808086-01

1859 B-5-(1-3)COF.

8015

RESULTS

See enclosed data sheet, Page 2.

QUALITY ASSURANCE

See enclosed data sheet, Page 3.

If there is any more that we can do, please ;:ve us a call. Thank you for using ANAMETRIX, INC.

Sincerely,

Smuch school

Sarah Schoen, Ph.D.

GC Manager

SRS/dg

of each well, with the penetrated thickness of the sand ranging from 3 (MW-1) to about 6 feet (MW-3 and MW-4). Well construction diagrams for all wells are presented in Appendix B. Depth to ground water in these wells, as measured on June 21, 1989, ranged from 8.59 (MW-4) to 10.28 (MW-3) feet below ground surface. Water level elevations for these wells range from 11.71 (MW-1) to 11.01 (MW-3) feet above mean sea level (MSL). Table 1 presents water level information and relative surface elevations for all monitoring wells at the site.

TABLE 1
Water Level Information

Well ID	Reference Elevation (feet)	Depth to Ground Water (feet)	Ground Water Elevation (feet)	Screened Interval Elevation (feet)
MW-1	21.28	9.57	11.71	16.283.72
MW-2	21.56	7.96	13.60	17.56 - 2.56
MW-3	21.78	10.77	11.01	14.285.72
MW-4	20.31	11.19	11.19	15.31 - 4.69

NOTE: All elevations relative to estimated bench mark elevation of 23 feet. Water levels measured on June 21, 1989.

Because monitoring wells MW-1, MW-3, and MW-4 are screened across the silty clay and gravelly sand interface, water level elevations in these wells are believed to represent a composite of the water level elevations found in the silty clay and gravelly sand water-bearing zones at the locations of these wells.

Monitoring well MW-2 was completed at a depth of 19 feet below ground surface and screened entirely within the silty clay unit. The depth to ground water in this well, as measured on June 21, 1989, was 7.71 feet below ground level. The water level elevation at this well is 13.60 feet above MSL. Because this well was completed entirely within the silty clay water-bearing zone, this water level elevation is thought to be representative of the water level elevation within this zone at the location of monitoring well MW-2.

To further investigate the difference in water level elevations between the silty clay and gravelly sand water-bearing zones, water level and well completion information was obtained from the Alameda County Health Department on four monitoring wells installed immediately south of the site. Well completion information for these wells (Appendix B) indicates that these wells are also completed within the silty clay water-bearing zone. Figure 5A presents a water table contour map

# ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS ANAMETRIX, INC. (408) 432-8192

| Sample I.D. : 1859 B-4-1,2,3 | Anametrix I.D. : 8808061-08

Matrix : SOIL Analyst : mh

Data campled : 08-08-88 Supervisor : 575

Date sampled: 08-08-88 Supervisor : 575
Date anl. TVH: 08-10-88 Date released : 08-12-88

Date ext. TEH: NA

Date ext. TOG : NA

Date anl. TEH: NA

Date anl. TOG : NA

:	CAS #	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)
3 5 1 6 9 1 4 4 1	TV	H as Gasoline	5000	BRL

BRL - Below reporting limit.

TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with

either headspace or purge and trap.

TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015 with direct injection.

TOG - Total Oil & Grease is determined by Standard Method 503E.

BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

Page 9 of 9.

of the silty clay water-bearing zone. This map is based on data collected from on-site monitoring well MW-2, as well as information from the off-site monitoring wells. Figure 5A shows the direction of ground water flow in the silty clay water-bearing zone to be in an westward direction.

The hydraulic conductivity of water-bearing materials at the site was determined by performing a slug test in all monitoring wells. Slug test data were evaluated in accordance with methods presented in Bouwer and Rice, 1976. Hydraulic conductivity results of the slug tests are summarized in Table 2 and presented in Appendix C. Slug test results for monitoring well MW-4 are not enclosed because the results are thought to be nonrepresentative due to well-completion problems encountered with this well. These problems resulted in the smearing of clay along the walls of the borehole during well installation, resulting in a lowering of the hydraulic conductivity measured in this well.

TABLE 2
Slug Test Results

Monitoring Well	Hydraulic Conductivity (ft/dy)
MW-1	3.07 (Lower Water-Bearing Zone)
MW-2	3.45 (Upper Water-Bearing Zone)
MW-3	2.13 (Lower Water-Bearing Zone)

The average hydraulic conductivity of the silty clay (or upper) water-bearing zone at the site, based on the analysis of slug tests performed in monitoring well MW-2 is 3.45 feet/day. The average rate of ground water movement within this water-bearing zone at the site can be calculated from the following formula (Freeze and Cherry, 1979):

	V	=	<u>KI</u>		
Where:	V K I n	= = = =	n Average linear velocity. Hydraulic conductivity. Hydraulic gradient. Effective porosity.		
At the site:	V	=	(3.45 ft/day)(0.0093 ft/ft) 0.30		
	$\mathbf{v}$	=	0.106 ft/day	=	39.03 ft/yr.

Note: n = Estimated.

The average linear velocity (V) may periodically shift with hydraulic gradient changes related to seasonal ground water level fluctuations.

# ANALYSIS DATA SHETT - PETROLEUM HYDROCARBON COMPOUNDS ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 1859 B-3-1,2,3 Anametrix I.D. : 8808061+07 Matrix : SOIL Analyst : mk Date sampled: 08-08-88 Supervisor : 5715 Date anl. TVH: 08-10-88 Date released : 08-12-88 Date ext. TEH: NA Date ext. TOG : NA Date anl. TEH: NA Date anl. TOG : NA

CAS #	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)	
	TVH as Gasoline	5000	BRL	
		1 8 8	† †	
			<u> </u>	

BRL - Below reporting limit.

TVH - Total Volatile Hydrocarbors is determined by modified EPA 8015 with either headspace or purge and trap.

TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015 with direct injection.

TOG - Total Oil & Grease is determined by Standard Method 503E.

BTEX- Benzene, Toluene, Ethylbeizene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures fcllow CRWQCB Region 2 guidelines.

Page 8 of 9.

Figure 5B presents water table contours as determined from water level elevations at monitoring wells MW-1, MW-3, and MW-4. Water table contours presented in Figure 5B are representative of water level elevations of the gravelly sand (or lower) water-bearing zone. Examination of Figure 6 indicates that the direction of ground water within this water-bearing zone is to the south. The ground water velocity of the lower water-bearing zone has not been estimated due to the close proximity of these wells to one another.

#### **4.0 SOIL CHEMISTRY**

Soil samples collected from soil and monitoring well borings were scanned with an hNu photoionization detector (PID) and selected samples submitted for laboratory analysis. The analytical results for these soil samples as well as previous soil samples taken by Ensco are summarized in Table 3. Laboratory reports are presented in Appendix D.

Results of soil analyses from Ensco borings B-1 and B-2 show TPH concentrations ranging from a high of 1,400 parts per million (ppm) (B-1-1) to a high of 580 ppm (B-2-2). TPH concentrations were below detection limits in soil samples taken from Ensco soil borings B-3, B-4, and B-5. TPH concentrations were also detected in soil samples taken from MW-1 and MW-2. Soil samples from monitoring well MW-1 showed a high of 1,400 ppm TPH (sample MW-1-1). The soil sample taken from MW-2 (MW-2-2) showed a TPH concentration of 70 ppm. Soil samples taken from monitoring wells MW-3 and MW-4 showed TPH concentrations below detection limits.

#### 5.0 GROUND WATER CHEMISTRY

Table 4 presents the results of laboratory analyses of ground water samples collected from monitoring wells at the site. Laboratory reports are presented in Appendix D. As shown in Table 4, dissolved hydrocarbon constituents have been detected at or above California action levels in all monitoring wells.

#### 6.0 DISCUSSION

## 6.1 Extent of Petroleum Constituents in the Soil

Based on the results of soil analyses (Table 3), the interpreted lateral extent of petroleum constituents found in soils at the site is shown in Figure 6. As shown in Figure 6, the lateral extent of petroleum constituents in the soils on site appears to be limited to the area in the immediate vicinity of the USTs and an area in the vicinity of MW-2, adjacent to the location of former pump islands at the site.

The geologic cross-sections presented in Figures 3 and 4 show the interpreted vertical extent of petroleum constituents in soil at the site. The vertical extent of petroleum constituents appears to be limited to about 17 feet beneath ground surface, approximately 2 feet beneath the estimated depth of the UST excavation.

# ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS ANAMETRIX, INC. (408) 432-8192

Anametrix I.D. : 8808061-06 Sample I.D. : 1859 B-2-2 : mh Analyst Matrix : SOIL : 875 Supervisor Date sampled: 08-08-88 Date released : 08-12-88 Date anl. TVH: 08-10-88 Date ext. TOG : NA Date ext. TEH: NA Date anl. TOG : NA Date anl. TEH: NA

CAS #	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)
71-43-2 108-88-3 100-41-4 1330-20-7	Benzene Toluene Ethylbenzene Total Xylenes TVH as Gasoline	200 200 200 200 5000	700 3300 7800 48000 580000

BRL - Below reporting limit.

TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with

either headspace or purge and trap.

TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015

with direct injection. TOG - Total Oil & Grease is determined by Standard Method 503E.

BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

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TABLE 3 Soil Chemical Analysis Concentrations in Parts Per Million (ppm)

Sample <u>Number</u>	<u>Benzene</u>	<u>Toluene</u>	Xylenes	Ethyl- <u>benzene</u>	<u>EDB</u>	<u>EDC</u>	TPH*	Total <u>Lead</u>
B-1-1 <sup>b</sup>	1.90	42.00	120.00	43.00	NAc	NA -	1,400.00	NA
B-1-1	NAc	NA	NA	NA	NA	NA	80.00	NA
B-1-3	NA	NA	NA	NA	NA	NA	$NF^d$	NA
B-1-4	NA	NA	NA	NA	NA	NA	NF	NA
B-2-1	1.50	16.00	33.00	35.00	NA	NA	550,0	NA
B-2-2	0.70	3.30	48.00	7.80	NA	NA	580.00	NA
B-3-1-2-3 (composite)	NA )	NA	NA	NA	NA	NA	NF	NA
B-4-1-2-3 (composite)	NA )	NA	NA	NA	NA	NA	NF	NA
B-5-1-2-3 (composite)	NA	NA	NA	NA	NA	NA	NF	NA
MW-1-1 <sup>e</sup>	1.2	14	100	19	NF	NF	850	4
MW-1-2	NF	1.9	16	1.9	NF	NF	80	3
MW-2-2	0.4	1.5	15	1.7	NF	NF	70	8
MW-3-2	NF	0.010	0.069	0.008	NF	NF	<0.2	: · 3
MW-4-2	NF	0.005	0.031	0.004	NF	NF	<0.2	2

<sup>&</sup>lt;sup>a</sup>TPH as gasoline.

<sup>b</sup>Soil samples collected by Ensco Environmental Services, Inc.

<sup>c</sup>Not Analyzed.

<sup>d</sup>Not Found.

<sup>c</sup>Soil samples collected by Ensco Environmental Services, Inc.

eSoil samples collected by Delta Environmental Consultants, Inc.

# ANALYSIS PARA SHEET - PETROLEUM HYDROCARBON COMPOUNDS ANALYSIS PARAMETRIX, INC. (408) 432-8192

Anametrix I.D. : 8808061-05 Sample I.D. : 1859 B-2-1 رىيە : Analyst Supervisor : 85 : SOIL Matrix Date sampled: 08-08-88 : 08-12-88 Date released Date anl. TVH: 08-11-88 Date ext. TOG : NA Date anl. TOG : NA Date ext. TEH: NA Date anl. TEH: NA

CAS #	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg	
71-43-2 108-88-3 100-41-4 11330-20-7	Benzene Toluene Ethylbenzene Total Xylenes TVH as Gasoline	200 200 200 200 5000	33	1500 6000 3000 5000 0000

TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with BRL - Below reporting limit.

either headspace or purge and trap.

TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015

with direct injection.

TOG - Total Oil & Grease is determined by Standard Method 503E.

BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by

modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

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## 6.2 Extent of Petroleum Constituents Dissolved in Ground Water

Dissolved petroleum constituents have been identified in water collected from all the monitoring wells installed at the site (Table 4). Highest dissolved petroleum concentrations were found at monitoring wells MW-2 (12,000 parts per billion (ppb) benzene) and MW-1 (1,400 ppb benzene). Monitoring wells MW-3 and MW-4 showed relatively low levels of dissolved hydrocarbons, 3.0 and 1.2 ppb benzene, respectively.

Ground Water Chemical Analyses
All Concentrations in Parts Per Million (ppm)

Monitoring <u>Well</u>	<u>Benzene</u>	Toluene	Ethyl- <u>benzene</u>	Xylenes	<u>EDB</u>	<u>EDC</u>	<u>TPHª</u>
MW-1	1.4	2.3	6.6	1.1	$NF^b$	0.01	12
MW-2	12	1.8	12	2.2	NF	NF	35
MW-3	0.003	0.002	0.009	0.001	NF	NF	0.1
MW-4	0.0012	NF	0.003	NF	NF	0.0015	<0.05

<sup>&</sup>lt;sup>a</sup>TPH as gasoline.

bNF not found.

Based on the ground water chemistry results, the location of the former pump island and the area in the immediate vicinity of the USTs (Figure 2) appears to be the likely source area for dissolved petroleum constituents in the ground water.

#### 7.0 RECOMMENDATIONS

Based on the results of the Phase I Hydrogeologic Assessment, Delta recommends the following:

- Installation of four additional ground water monitoring wells to be completed within the silty clay (upper) water-bearing zone. These wells would be installed in the area around monitoring well MW-2 (Figure 7) to further investigate the lateral and vertical extent of petroleum constituents in soil and ground water.
- Installation of one additional ground water monitoring well south of the USTs to further investigate the vertical and lateral extent of petroleum constituents in this area of the site. This well would be completed across the silty clay (upper) and gravelly sand (lower) water-bearing zones as are existing monitoring wells MW-1, MW-3, and MW-4.

# ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS ANAMETRIX, INC. (408) 432-8192

: 1859 B-1-4 Sample I.D. : SOIL atrix Bate sampled : 08-08-88

Date anl. TVH: 08-08-88 ate ext. TEH: NA ate anl. TEH: NA

: 8808061-04 Anametrix I.D.

Analyst : ኡና Supervisor

: 08-12-88 Date released

: NA Date ext. TOG : NA Date anl. TOG

	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)	
'	TVH as Gasoline	5000	BRL	1 1 1 1

TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with

either headspace or purge and trap.

FEH - Total Extractable Hydrocarbons is determined by modified EPA 8015

with direct injection.

TOG - Total Oil & Grease is determined by Standard Method 503E.

BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

Page 5 of 9.

- Collection of soil samples at 5-foot intervals during drilling of all additional monitoring wells.
- Submission of selected soil samples (selection based on results of field-screening samples with an hNu photoionization detector for total organic vapors) to a California-certified laboratory to be analyzed for BTEX, EDB, EDC, and TPH.
- Development and sampling of all additional monitoring wells at the site (MW-5 through MW-9).
- Submission of ground water samples to a California-certified laboratory to be analyzed for BTEX, EDB, EDC, and TPH.
- Collection of water level data from all wells (MW-1 through MW-9) in order to construct a map of ground water elevations in the silty clay (upper) and gravelly sand (lower) water-bearing zones.
- Preparation of a Phase II Hydrogeologic Assessment Report presenting results of the activities outlined above and recommendations (if needed) for soil and/or ground water remediation activities at the site.

# ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 1859 B-1-3 : SOIL Matrix

Date sampled: 08-08-88 Date anl. TVH: 08-08-88

Date ext. TEH: NA Date anl. TEH: NA

: 880,8061-03 Anametrix I.D. : mh

Analyst

: 545 Supervisor

: 08-12-88 Date released : NA

Date ext. TOG Date anl. TOG : NA

1	CAS #	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)
		VH as Gasoline	5000	BRL
			;	

BRL - Below reporting limit.

TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with

either headspace or purge and trap.

TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015

with direct injection.

TOG - Total Oil & Grease is determined by Standard Method 503E.

BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by

modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

Page 4 of 9.



#### **8.0 REMARKS/SIGNATURES**

The recommendations contained in this report represent our professional opinions, and are based in part on information supplied by the client. These opinions are based on currently available information and are arrived at in accordance with currently accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended.

DELTA ENVIRONMENTAL CONSULTANTS, INC.

This report was prepared by:

Darrell L. Nations Senior Hydrogeologist/ Project Manager Date <u>2/23/89</u>

This report was reviewed by:

Chris W. Metzger

Senior Hydrogeologist/

California Registered Geologist #4673

Date\_ 8/Z3/89

# 467**3** 

/law

# ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS ANAMETRIX, INC. (408) 432-8192

: 88Q8061<del>-</del>02 Anametrix I.D. Sample I.D. : 1859 B-1-2 : mh Analyst : SOIL Matrix : ফ্র Supervisor Date sampled: 08-08-88 : 08-12-88 Date released Date anl. TVH: 08-11-88 : NA Date ext. TOG Date ext. TEH: NA : NA Date anl. TOG Date anl. TEH: NA

CAS =	Compound Name	Reporting Limit (ug/kg)	Amount Found (ug/kg)
 	TVH as Gasoline	5000	80000
1 1 1			

BRL - Below reporting limit.

TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with

either headspace or purge and trap.

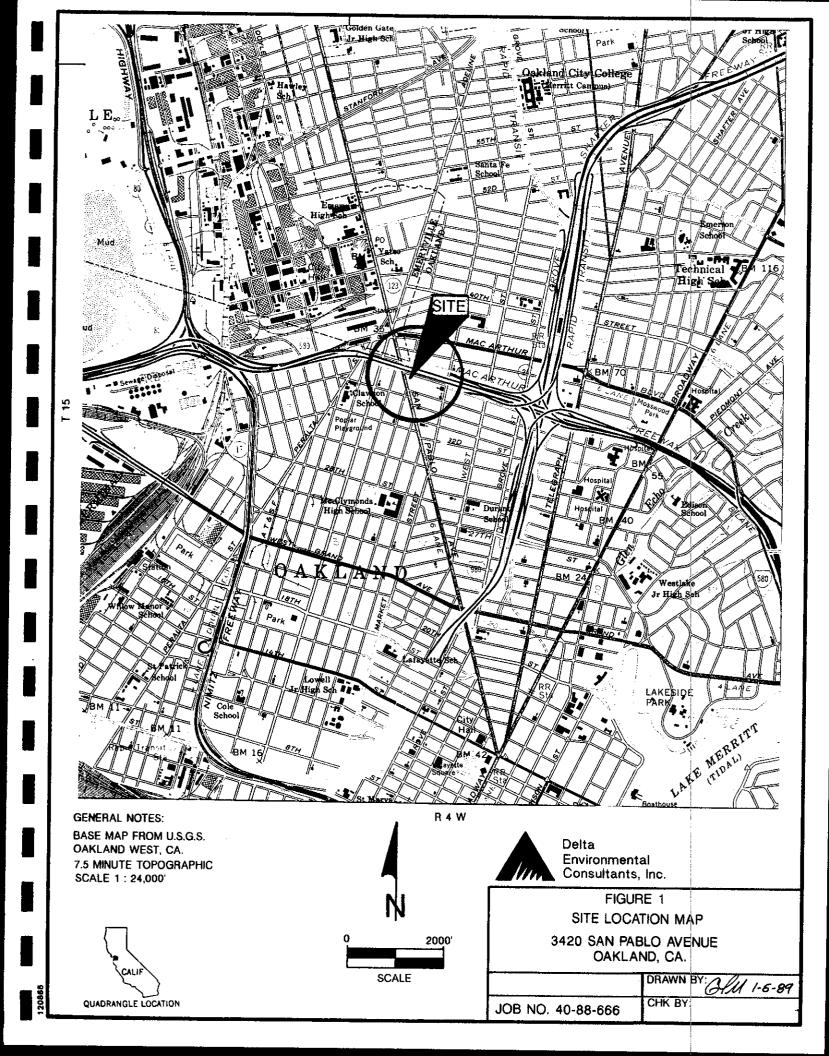
TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015 with direct injection.

TOG - Total Oil & Grease is determined by Standard Method 503E.

BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

Page 3 of 9.



# ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS ANAMETRIX, INC. (408) 432-8192

: 8808061+01 Anametrix I.D. Sample I.D. : 1859 B-1-1 Analyst : SOIL Matrix : 2m Supervisor Date sampled: 08-08-88 : 08-12-88 Date released Date anl. TVH: 08-10-88 : NA Date ext. TOG Date ext. TEH: NA Date anl. TOG : NA Date anl. TEH: NA

	Mana	Reporting Limit (ug/kg)	Amount Found (ug/kg)
108-88-3 100-41-4 1330-20-7	Compound Name  Benzene Toluene Ethylbenzene Total Xylenes TVH as Gasoline	200 200 200 200 200 5000	1900 42000 43000 120000 140000

BRL - Below reporting limit.

TVH - Total Volatile Hydrocarbons is determined by modified EPA 8015 with either headspace or purge and trap.

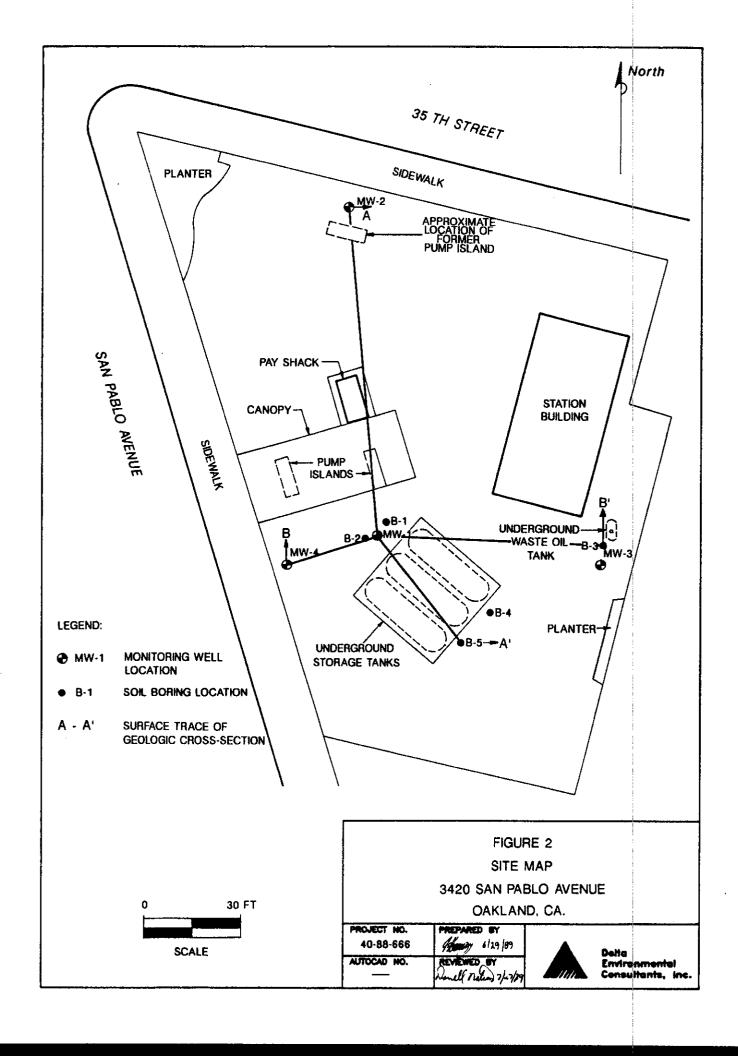
TEH - Total Extractable Hydrocarbons is determined by modified EPA 8015 with direct injection.

TOG - Total Oil & Grease is determined by Standard Method 503E.

BTEX- Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow CRWQCB Region 2 guidelines.

Page 2 of 9.



# ANAMETRIX, INC.

#### ENVIRONMENTAL • ANALYTICAL CHEMISTRY 1961 CONCOURSE DRIVE, SUITE E • SAN JOSE, CA 95131 • (408) 432-8192

Dave Blunt Ensco/Exceltech 41674 Christy Street Fremont, CA 94538-3114 August 12, 1988
Work Order Number 8808061
Date Received 08/09/88
PO No. 10309

Dear Mr. Blunt:

Nine soil samples were received for analysis of BTEX plus total volatile hydrocarbons as gasoline by gas chromatography, using the following EPA method(s):

ANAMETRIX I.D.	SAMPLE I.D.	METHOD(S)
8808061-01	1859 B-1-1	8015/8020
-02	" B-1-2	8015
-03	" B-1-3	••
-04	" B-1-4	••
-05	" B-2-1	8015/8020
-06	" B-2-2	•
-07	" B-3-1,2,3	8015
-08	" B-4-1,2,3	•
-09	" B-4-4	HOLD

#### RESULTS

See enclosed data sheets, Pages 2 thru 9.

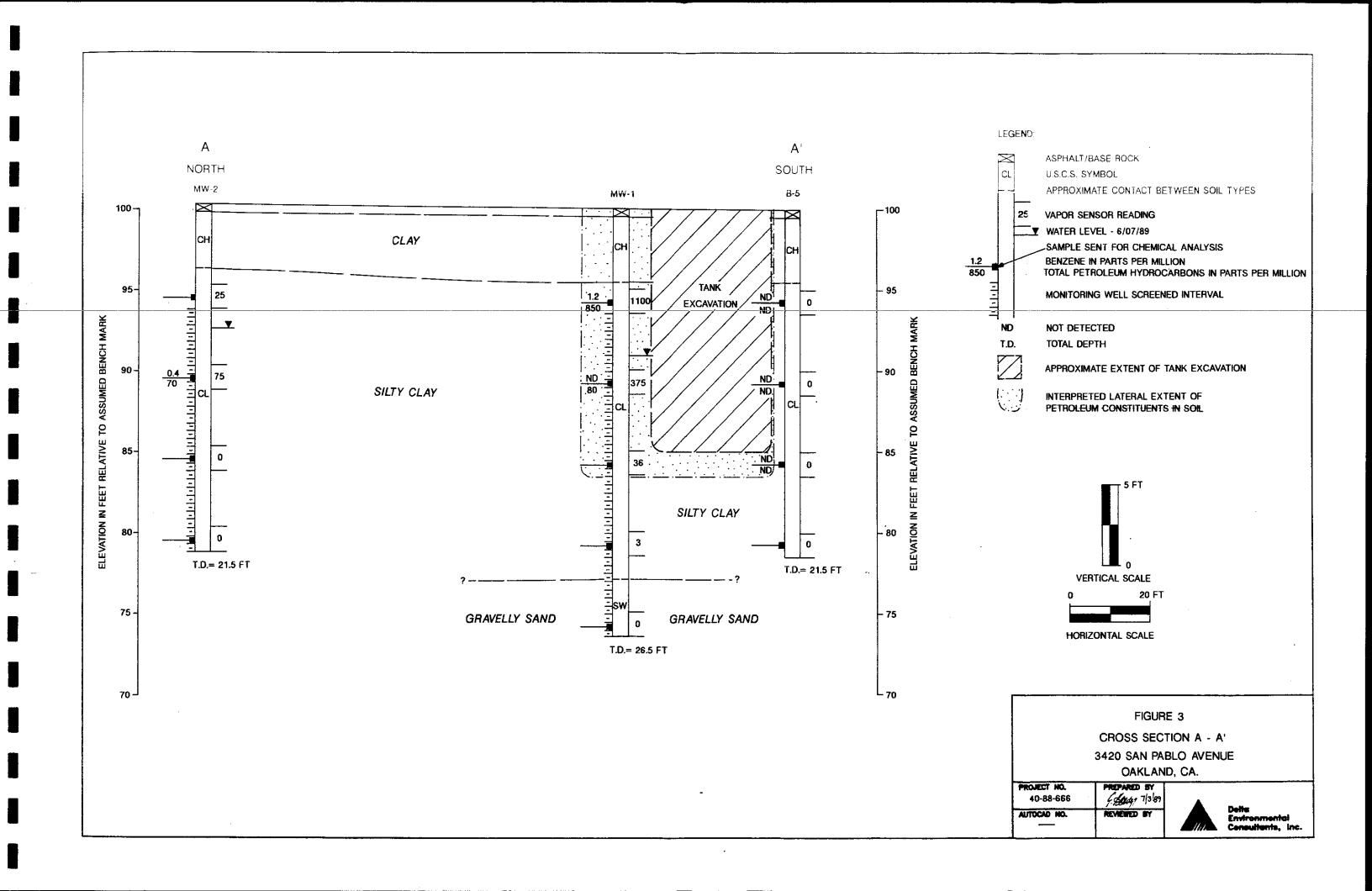
If there is any more that we can do, please give us a call. Thank you for using ANAMETRIX, INC.

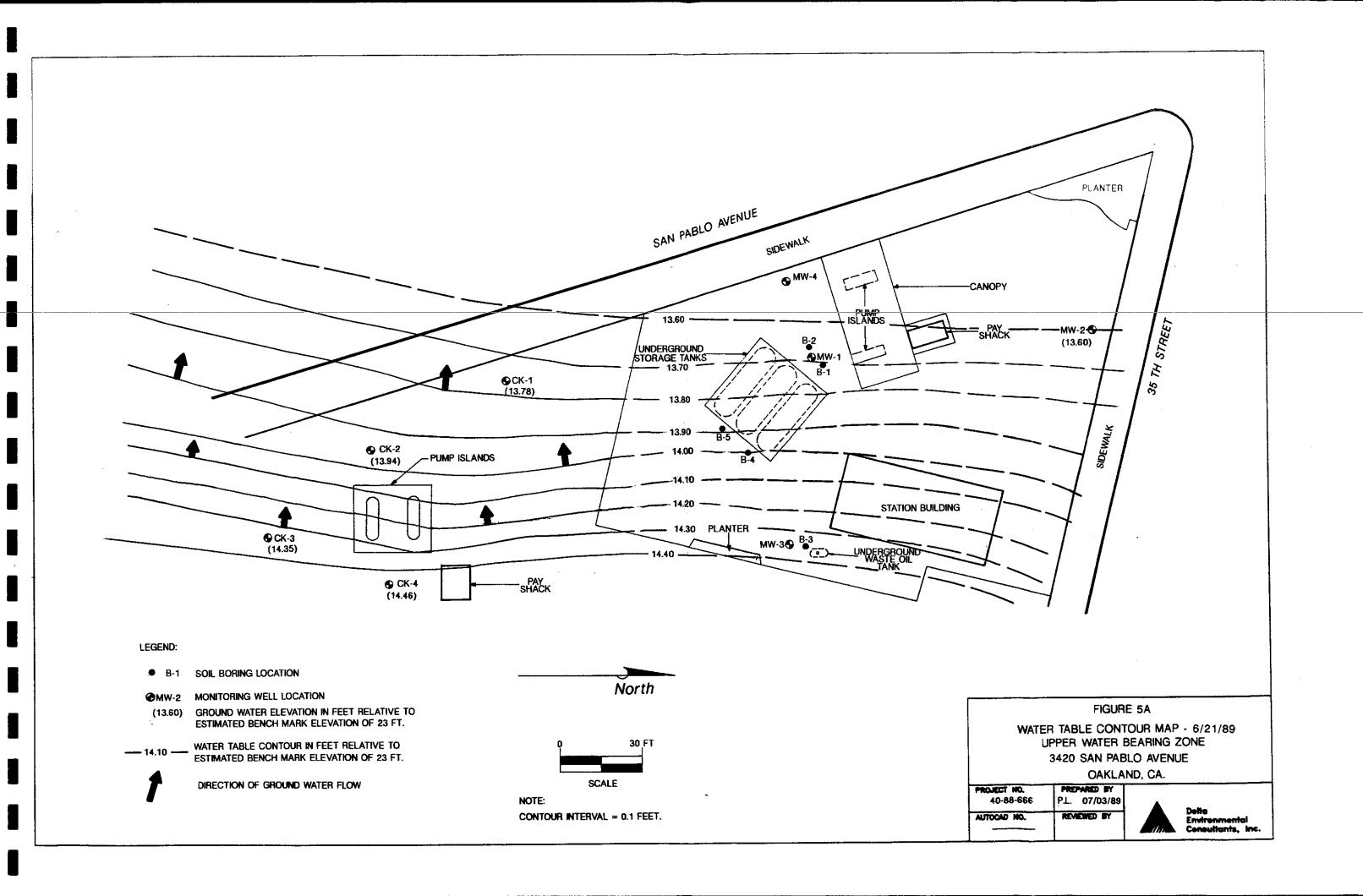
Sincerely,

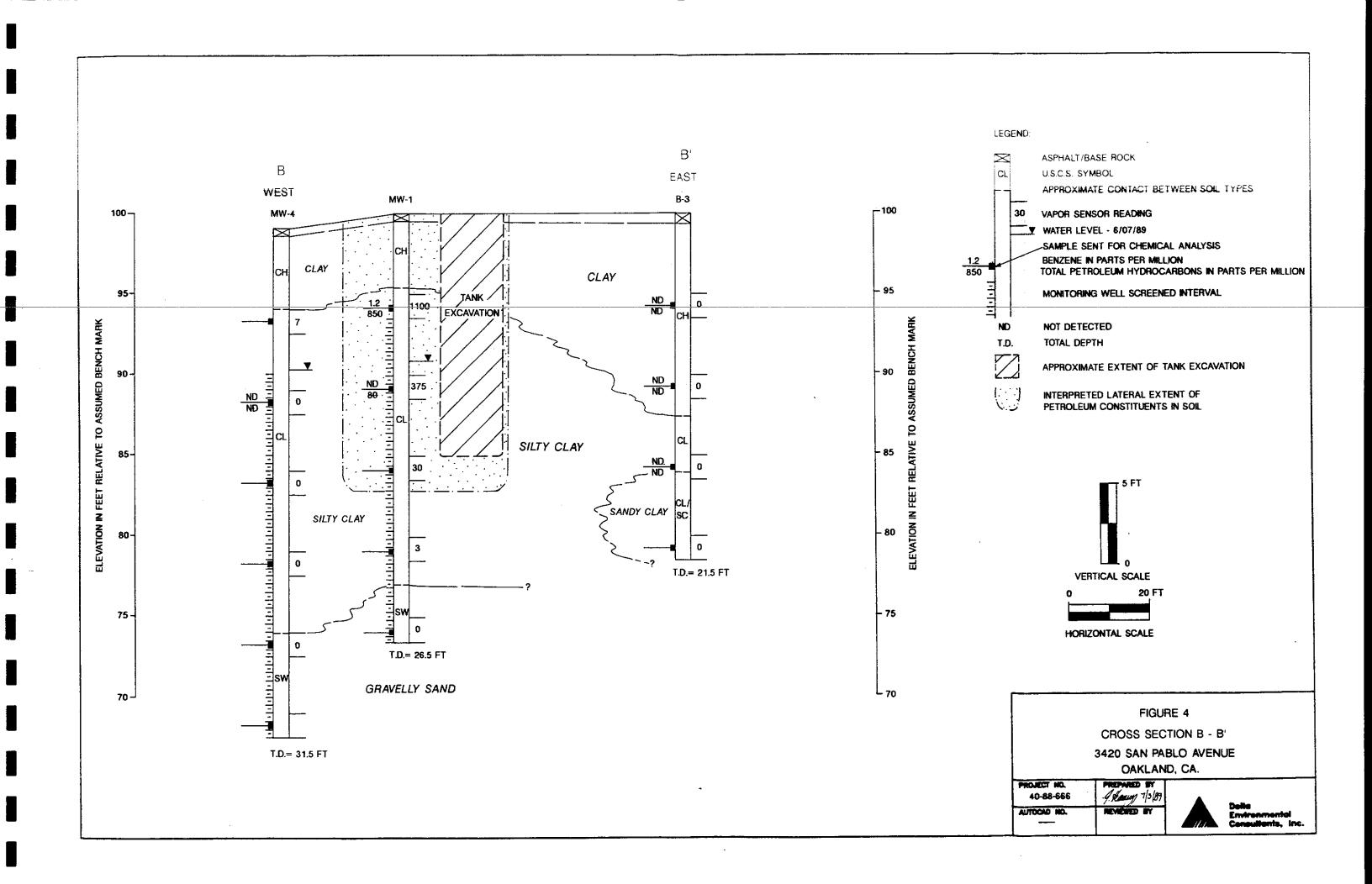
Fruh Fehren

Sarah Schoen, Ph.D. GC Manager

SRS/1m







Central Coast Analytical Services

Central Coast Analytical Services, Inc. 141 Suburban Road , Suite C-4 San Luis Obispo, California 93461 (895) 543-2553

Lab Number: #4/17/89 Collected: 64/19/89 Received: **Ø4/27/89** Tested: Collected by: H. Hansen

F-#4846

Fuel Fingerprint Analysis - EPA Method 826# EXTRACTED BY EPA METHOD 5#3# (purge-and-trap)

SAMPLE DESCRIPTION:

Oakland Shell, Delta #49-88-666-91, Travel Blank - Client Supplied, Water

Suite 115 Rancho Cordova, CA: 95676

ATTN: Hal Hansen

Delta Environmental

11836 White Rock Rd.

Compound Analyzed	Detection Limit	Concentration	
	in ppm (PQL)*	in ppm	
	<b>6</b> .8681	not found	
Benzene	9.9991 6.961	not found	
Toluene	9.991 9.951	not found	
Ethylbenzene	Ø. ØØ1	not found	
Xylenes	8.8881	not found	
1,2-Dichloroethane (EDC)	Ø.ØØØ1	not found	
Ethylene Dibromide (EDB)	<b>9.999</b> (	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
TOTAL PURGEABLE PETROLEUM HYDRO	DCARBONS Ø.#5	<Ø.Ø5	
BTX as a Percent of Fuel		not applic	cab
Percent Surrogate Recovery		79.	
· 李祖· · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·	<b>医有性多层有效性有效性多性性</b>	
*/Proctical Quantitation Limit			

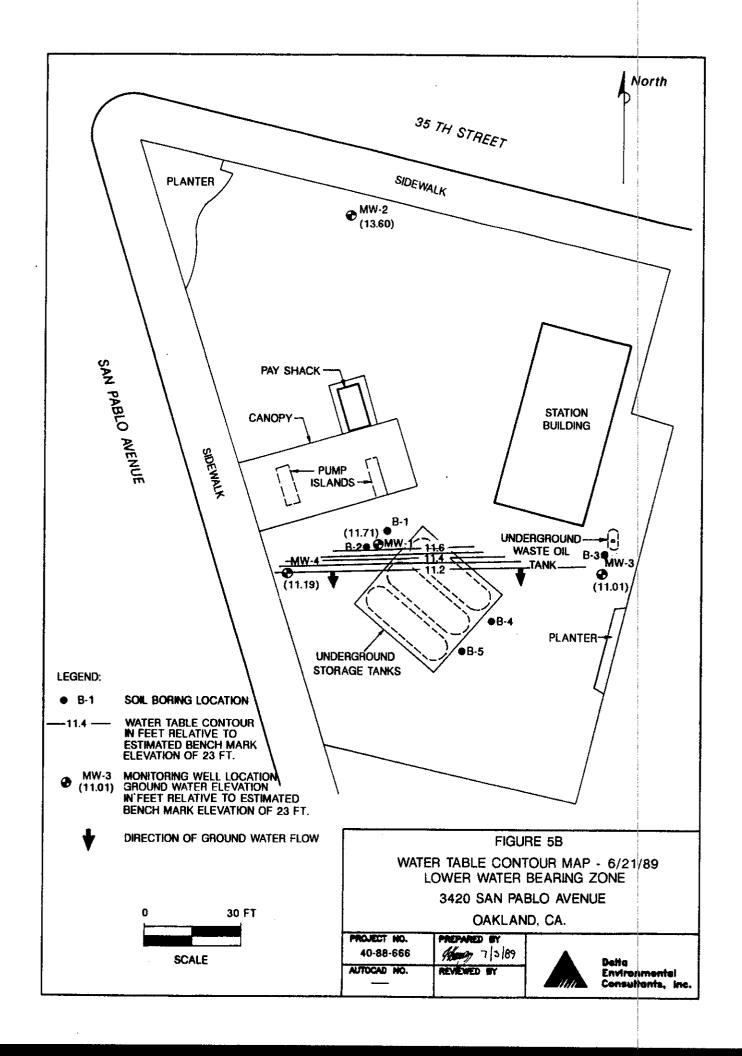
\*(Practical Quantitation Limit)

MSD#6 **#5-17-89** F#4846f.wr1/68 MH/gb/js/rh

Respectfully submitted, CENTRAL COAST ANALYTICAL SERVICES

Mary Havlicek, Ph.D.

President



Central Coast Analytical Services

Central Coast Analytical Services, Inc.

Collected: Received:

Lab Number:

F-64845 64/17/89

141 Suburban Road , Suite C-4 San Luis Obispo, California 93451 Tested:

**#4/19/89** \$4/26 & \$5/\$\$/89

(8\$5) 543-2553

Collected by: H. Hansen

Fuel Fingerprint Analysis - EPA Method 826# EXTRACTED BY EPA METHOD 5939 (purge-and-trap)

SAMPLE DESCRIPTION:

Oakland Shell, MW-4, #4#-88-666-#1,

Water

Delta Environmental 11535 White Rock Rd. Suite 116

ATTN: Hol Hansen

Rancho Cordova, CA 95676

Concentration **Detection Limit** Compound Analyzed in ppm in ppm (PQL)"

Benzene Toluene Ethylbenzene Xylenes 1,2-Dichloroethane (EDC) Ethylene Dibromide (EDB)	5.5551 5.551 5.551 5.551 5.5551 5.5551	g.gg12 not found not found g.gg3 g.gg15 not found
TOTAL PURGEABLE PETROLEUM HYDROCARBONS (GASOLINE)	ø. ø5	<Ø.Ø5

BTX as a Percent of Fuel

not applicable

Percent Surrogate Recovery

107.

\*(Practical Quantitation Limit)

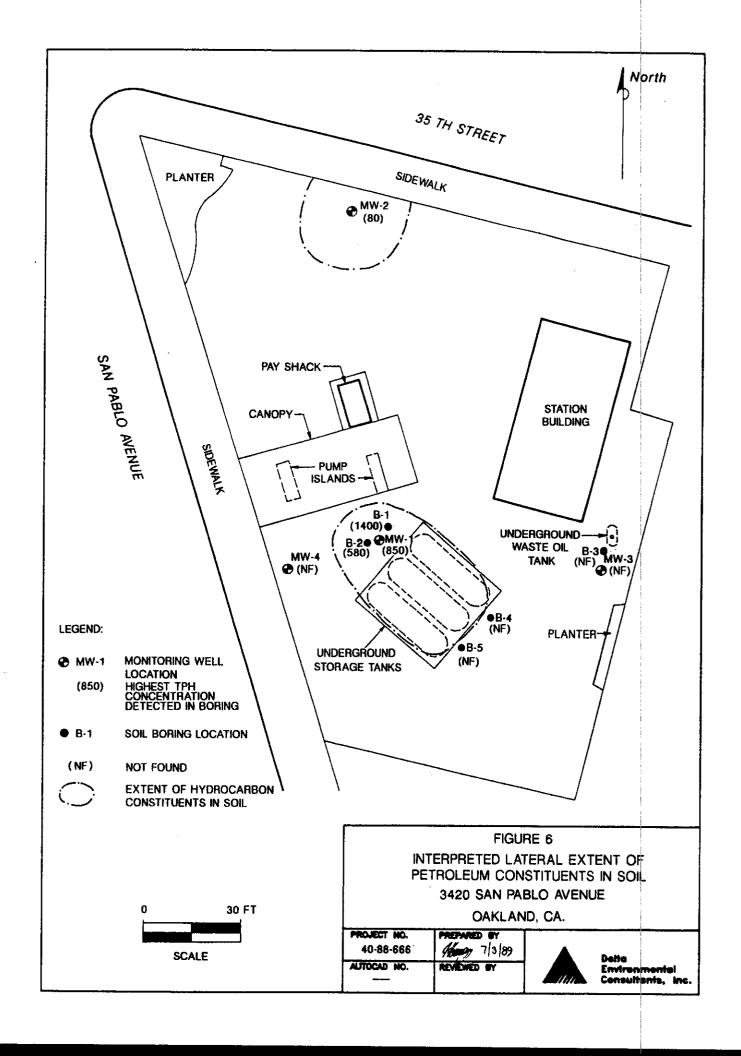
Respectfully submitted,

CENTRAL COAST ANALYTICAL SERVICES

MSD#6 **65/13/89** F#4845f.wr1/66 MH/jm/jc/tl

Mary Havlicek, Ph.D.

President



Central Coast
Analytical Services, Inc.
141 Suburban Road , Suite C-4
San Luis Obispo, California 934£1

Lab Number: F-#4844
Collected: #4/17/89
Received: #4/19/89
Tested: #4/27/89
Collected by: H. Hansen

(8#5) 543-2555 Collected by: H. Hansen Fuel Fingerprint Analysis - EPA Method 826# EXTRACTED BY EPA METHOD 5#3# (purge-and-trap)

ATTN: Hal Hansen Delta Environmental 11#3# White Rock Rd.

SAMPLE DESCRIPTION:
Ogkland Shell, Delta #46-88-666-51.

Suite 11#

MW-3, Water

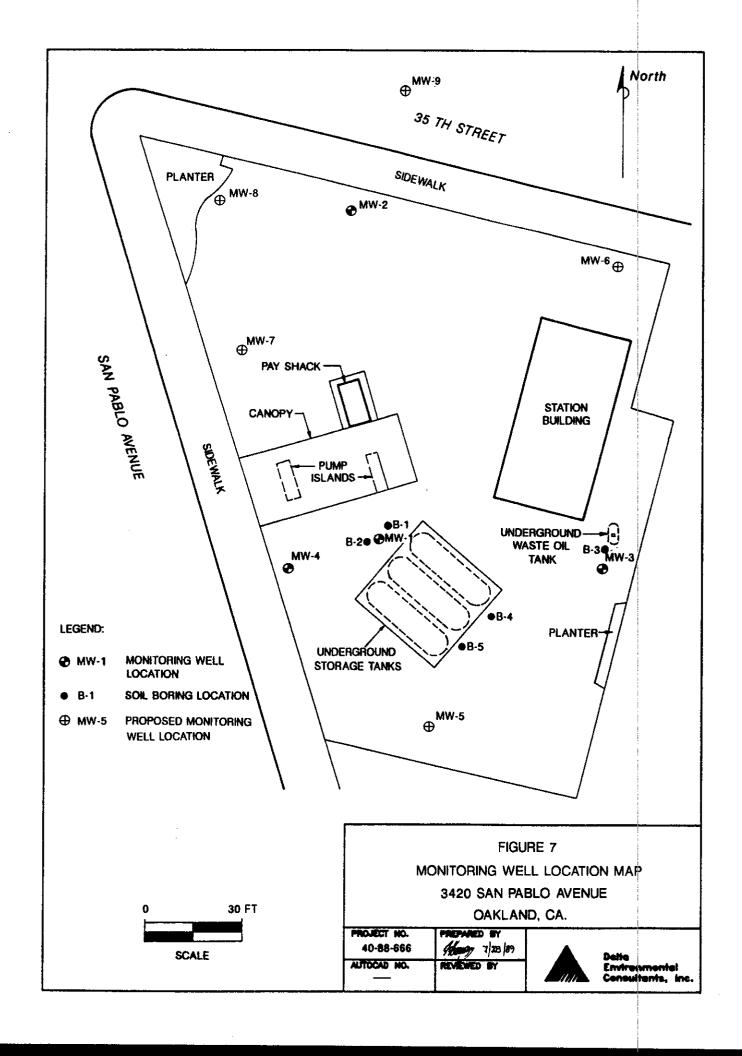
Rancho Cordova, CA 95676

tection Limit n ppm (PQL)*	Concentration in ppm
	a aa:
	Ø. ØØ3
• • •	9.992
* * * * *	Ø. ØØ1
Ø. ØØ1	Ø. ØØ9
Ø. ØØ1	not found
Ø. ØØ1	not found
Ø.1	Ø.1
	14.
	94.
	6.551 6.551 6.551 6.551 6.551 6.551

\*(Practical Quantitation Limit)

MSD#6 #5-17-89 F#4844f.wr1/68 MH/gb/js/rh Respectfully submitted, CENTRAL COAST ANALYTICAL SERVICES

Mary Havlicek, Ph.D.



Central Coast
Analytical Services, Inc.
141 Suburban Road , Suite C-4
San Luis Obispo, California 934\$1
(8\$5) 543-2553

Lab Number: F-4843dup
Collected: \$4/17/89
Received: \$4/19/89
Tested: \$4/26/89
Collected by: Hansen

Fuel Fingerprint Analysis - EPA Method 524.2/8249 EXTRACTED BY EPA METHOD 5939 (purge-and-trap)

Delta Environmental Consultants 11836 White Rock Road Suite 118

Suite 11∰ Rancho Cordova, California 9567∰ SAMPLE DESCRIPTION:
Oakland Shell, MW-2, Water
Job # 49-88-66691
Duplicate Analysis

Compound Analyzed	Detection Limit in ppm (PQL)*	Concentration in ppm
Benzene Toluene Ethylbenzene Xylenes 1,2-Dichloroethane (EDC)	g.g1 g.1 g.1 g.1 g.1	12. 1.8 2.2 12. ø.ø36 **
Ethylene Dibromide (EDB)	Ø.1	not found
TOTAL PURGEABLE PETROLEUM HYDR	ROCARBONS 1.	35.
BTX as a Percent of Fuel		74.
Percent Surrogate Recovery		78.
		多数体型或排作者等有核型性形容和纤维

\*(Practical Quantitation Limit)

Respectfully submitted,

CENTRAL COAST ANALYTICAL SERVICES

F-4843dup Mary Havlicek, Ph.D. President

MH/ .IM/CRR/SCH

JM/CRR/SCH F4843DUP.WR1/S-13Ø

<sup>\*\*</sup> Reported below PQL to illustrate agreement with duplicate.

#### APPENDIX A

Soil Boring Logs

Central Coast Analytical Services, Inc. 141 Suburban Road , Suite C-4 San Luis Obispo, California 93491 (8\$5) 543-2553

Lab Number: F-4843 Collected: **#4/17/89 #4/19/89** Received: **Ø4/26/89** Tested: Collected by: Hansen

Fuel Fingerprint Analysis - EPA Method 524.2/8245 EXTRACTED BY EPA METHOD 5039 (purge-and-trap)

Delta Environmental Consultants, IncSAMPLE DESCRIPTION:

11#3# White Rock Road

Oakland Shell, MW-2, Water

Job # 49-88-66691 Suite 11#

Rancho Cordova, California 95675

Compound Analyzed	Detection Limit in ppm (PQL)*	Concentration in ppm
Benzene	ø.ø1	>7.5
Toluene	Ø. Ø1	1.5
•	Ø,Ø1	1.8
Ethylbenzene	Ø. Ø1	>8.1
Xylenes 1,2-Dichloroethane (EDC)	Ø. Ø1	Ø.Ø33
Ethylene Dibromide (EDB)	Ø.Ø1	not found
TOTAL PURGEABLE PETROLEUM HYDRO	OCARBONS Ø.1	>19.
BTX as a Percent of Fuel		88.
Percent Surrogate Recovery		87.
B II d 字 II II		计电影电影电影 化苯甲基苯甲基苯甲苯
*/Procticel Quantitation Limit	<b>)</b>	•

\*(Practical Quantitation Limit)

Respectfully submitted, CENTRAL COAST ANALYTICAL SERVICES

May Hawleril

Mary Havlicek, Ph.D.

President

F-4843 JM/CRR/SCH F4843FF.WR1/S-139

P	ROJE	CT NA	ME / L	OCATION		PROJECT NUMBER: 40-88-	BORING NUMBER: 1	M-1 SHE	ET 1 OF 2
3.0	420 <i>!</i> aklai	San P	ablo A	venue		CONTRACTOR: West Hazmat	Drilling	DRILLING METHOD:	H.S.A.
		, -	••			DRILLER: Randy Re	eidhead	DRILLING RIG:	CME-55
						START: 8:00		COMPLETE	): <b>4-11-89/10:</b> 3
ä	AND WNER			oil ∞		SURFACE ELEVATION: 100.	.00 (relative)	LOGGED BY Hal Ha	: nsen
S	IS I	BLOW	S I A N P L E(ft)	RECOVÍ				CONTAMINA	
SAMPLE	I S I I A U P M N P P I	4 O U	MT	MC	DEPIH	DESCRIPTIONS OF AND CONDITE	MATERIALS	INSTRUMEN	- OBSERVATION
E	LE	T S	L E(ft)	L V E(in)	SCALE 1"= 4'			i	
		1	1-,-,	_\_\		ASPHALIT AND ROAD	BASE	UNITS: Ti	p Odor
					1 +	CIAY; very dark o	ray, highly	1	
		Ì			2 +	CIAY; very dark of plastic, slightly sand (CH)	moist, no—		
					3 +		-		
CA	Marr				<u></u>	731W11 AT 11			
٦	MWI 1	饕	5.0- 6.5	18	5 +	SANDY CLAY; dark gray, moderately slightly moist, s coarse, some grav the bottom of the	greenish — plastic,	1100	Strong odor
		155			<u>-</u>	coarse, some grav	and fine to— el toward		
			1		7+	the bottom of the	unit (CL) —		
	l				8 +		<del></del>		
CA	ME21	1,2/	10.0-	18	9 +		-		
\ \tag{\tag{\tag{\tag{\tag{\tag{\tag{	MW1 2	遂	11.5	10	10			375	Slight odor
					12		•		
					13		-		
					14				
CA	MWT	6/6/	   15.0-	17	15			20	
	3	6/6/ 9	16.5	- '		SILTY CLAY; dark	yellowish -	30	Slight odor
					17	brown, moderately very moist, stiff at the bottom of	, some draver	•	
					18	at the pottom of t	uitic (CT) —		
					19				
CA.	MWI	11/	20.0-	15	20		-	2	37
	MW] 4	ジ	20.0- 21.5		21			3	Very slight odor
		- <del>-</del>			22 —		7		
				٠. ا	23	·	-		
					+				
		TER L	EVEL D	ATA	PROFESS	IONAL GEOLOGIST			
DA									
TI					SIGNATUR	TE .			* ************************************
GW						-			
CAS	SING PIH				TYPED NA	ME:			
		<u></u>			TIFED NA	PIL)	···		

Central Coast Analytical Services, Inc. 141 Suburban Road , Suite C-4 San Luis Obispo, California 934#1 (8#5) 543-2553

Lab Number: F-4842 **Ø4/17/89** Collected: Ø4/19/89 Received: Ø4/26/89 Tested: Collected by: Hansen

Fuel Fingerprint Analysis - EPA Method 524.2/824# EXTRACTED BY EPA METHOD 5#3# (purge-and-trap)

Delta Environmental Consultants, IncSAMPLE DESCRIPTION:

11#3# White Rock Road

Oakland Shell, MW-1, Water

Job # 49-88-66691

Suite 115 Rancho Cordova, California 9567€

Compound Analyzed	Detection Limit in ppm (PQL)* :	Concentration in ppm
Benzen <del>e</del>	Ø. Ø1	1.4
Toluene	ø.ø1	2.3
Ethylbenzene	Ø.Ø1	1.1
Kylenes	Ø.Ø1	6.6
1,2-Dichloroethane (EDC)	Ø.Ø1	Ø. Ø1
Ethylene Dibromide (EDB)	ø.ø1	not found
TOTAL PURGEABLE PETROLEUM HYDR (GASOLINE)	•	12.
BTX as a Percent of Fuel		86.
Percent Surrogate Recovery		95.
	电放音器 化双氯甲基苯甲基苯甲基苯甲基苯甲基苯甲	***********
*(Practical Quantitation Limit	.)	

Respectfully submitted, CENTRAL COAST ANALYTICAL SERVICES

Mary Havlicek, Ph.D.

President

F-4842 JM/CRR/SCH F4842FF.WR1/S-139

PROJECT NAME / LOCATION	PROJECT BORING	SHEET 2 OF 2
	NUMBER: 40-88-666 NUMBER: CONTRACTOR:	MW-1 DRILLING
3420 San Pablo Avenue Cakland, CA	West Hazmat DRILLER:	METHOD: H.S.A.
	Randy Reidhead	DRILLING RIG: CME-55
LAND	START: 8:00/4-11-89	COMPLETED: 10:30/4-11-89
OWNER: Shell Oil Company	SURFACE ELEVATION: 100.00 (relative)	LOGGED BY: Hal Hansen
STSNBCSISR AYAULOANAE MPMMOUMT MC DEPIH PEPBWNPPO LETTL EERSE(ft) E(in) 1"= 4'	DESCRIPTIONS OF MATERIALS	CONTAMINANI OBSERVATION GENERAL
PEPBWN PPO LLE TL LV SCALE EER SE(ft) E(in) 1"= 4'	AND CONDITIONS	INSTRUMENT: OBSERVATION NOTES
	DAUGITY CANDA berry	UNITS: Tip
CA MW1 12/ 25.0-6 25 1 26 26 1 26 1 26 1 26 1 26 1 26 1	RAVELLY SAND; brown, very coarse sand, saturated, ravel 1/2 inch to 1/4 inch, unor plastic fines (SW)	lost sample No odor
	otal Depth 25.0 feet	-
	ocal beput 25.0 reet	
29 —	-	
30 —	-	
■         31 —		
32	-	
34		·
35		
<b>-</b>   36 <del>  -</del>		
37 —		
38 +-	$\dashv$	
39	7	
42 +		
_       43 +	4	
45 +	ᅾ	
46		
WATER LEVEL DATA PROFESSION DATE	NAL GEOLOGIST	
TIME		
GWL SIGNATURE		
CASING		

Central Coast Analytical Services, Inc. Lab Number: | Collected:

B-64269

Analytical Services, Inc. 141 Suburban Road , Suite C-4

Received: Tested:

Ø4/2Ø/89

San Luis Obispo, California 934#1 (8#5) 543-2553

Collected by:

Fuel Fingerprint Analysis - EPA Method 826# EXTRACTED BY EPA METHOD 5#3# (purge-and-trap)

SAMPLE DESCRIPTION: INSTRUMENT BLANK

CCAS

Compound Analyzed	Detection Limit in ppm (PQL)*	Concentration in ppm
		act found
Benzene	Ø. ØØØ1	not found not found
Toluene	Ø. ØØ1	****
Ethylbenzene	Ø.ØØ1	not found
Xylenes	Ø.ØØ1	not found
1,2-Dichloroethane (EDC)	Ø.ØØØ1	not found
Ethylene Dibromide (EDB)	Ø.ØØØ1	not found
TOTAL PURGEABLE PETROLEUM HYDRO (GASOLINE)	CARBONS Ø.Ø5	<Ø.Ø5
BTX as a Percent of Fuel		not applicabl
Percent Surrogate Recovery		1ø6.
医苯甲基甲基甲基苯甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲基甲	***************	<b>多实性是但多类性性结果实施是多非性是</b>

\*(Practical Quantitation Limit)

MSD#6 #4/24/89 8#42#9f.wr1/53 MH/ec/jc/tl Respectfully submitted,

CENTRAL COAST ANALYTICAL SERVICES

Mary Havlicek, Ph.D.

PF	<b>WEX</b>	er nai	Œ / Lo	CATION		PROJECT NUMBER: 40-88-666	BORING NUMBER: M	W-2 SH	EET 1 OF 1
34 Ož	20 S	ian Pa	ablo Av	enue		CONTRACTOR: West Hazmat		DRILLING METHOD:	H.S.A.
		·			·	DRILLER: Randy Re		DRILLING RIG:	CME-55
	<del></del>		<del> </del>	· · · · · · · · · · · · · · · · · · ·		START: 8:00/4-10-	89	COMPLETE	D: 9:45/4-10-89
OW	ND NER:			1 Comp	any	SURFACE ELEVATION: 100.29	(relative)	LOGGED BY Hal I	Y: Hansen
SAYP MPE	S N A U	BLOW TS	SI AN TP	RECOV	DEPIH	DESCRIPTIONS OF MAT	PDTATE	CONTAMINA OBSERVAT	ION GENERAL
P E	PE	ΨŇ	1 L	P O L V	SCALE	AND CONDITIONS	CKIALS	INSTRUME	OBSERVATION NOTES
E	ER	S	Ē(ft)	Ē(in)	1"= 4'			UNITS: T	ip
					1	SPHALIT AND ROAD BAS			
					2 — p	IAY; very dark gray lastic, slightly mo o sand (CA)	ist, —		
					3 🕂 "	o sam (ai)			
					4	ANDY CLAY; dark gre	enish -		
CA	MW2 1	6/ 19/ 19	5.0- 6.5	18	5 + g	ANDY CLAY; dark gree ray, moderately low icity, slightly moi rades to gravel at 1 f the unit (CL)	plas- st, sand -	25	Moderate odor
		19			6 <del>                                      </del>	rades to gravel at 1 f the unit (CL)	ootton —		
					7 <del> </del> 8 <del> </del>				
					9 —		-		
CA	MW2	9/	10.0~	17	10			75	Moderate
	2	9/ 10/ 14	11.5		11 +		$\Box$	75	odor
					12 +				
1 1					13 +				
]					14				
CA	MW2 3	4/5/	15.0-	16	15 ———			0	No odor
	د ا	′	16.5		16 - Si	HITY CLAY; dark yell cown, moderately low city, moist stiff of ward bottom of the	.owish plas-—		
					17 🕂 🕏	ward bottom of the	unit -		
					18 —	<b>L</b> )	-1		
					19 🕂		4		
CA	MW2 4	12/ 26/ 35	20.0- 21.5	17	20 — To	otal Depth 20.0 feet		0	No odor
		35			21 🛨		· -}		
				.	22 —		-]		
					23 🛨		4		
	WAJ	ER L	VEL D	ATA	PROFESSIO	NAL GEOLOGIST			
DAT	E								
TIM	Œ				SIGNATURE				
GWI					STORE				
~~	ING		1			l l			

CCAS

Central Coast Analytical Services, Inc. Lab Number: QS-#42#9

64/25/89

Collected:

Received: 141 Suburban Road , Suite C-4 San Luis Obispo, California 934#1

Tested:

(8\$5) 543-2553

Collected by:

Fuel Fingerprint Analysis - EPA Method 8265 EXTRACTED BY EPA METHOD 5#3# (purge-and-trap)

SAMPLE DESCRIPTION: ROASTED SOIL SPIKE

Spiked with gasoline to \$.673 ppm

Compound Analyzed		Detection Limit in ppm (PQL)*	Concentration w/spike in ppm	Percent Recovery
		# ###	ø.ø26	94.
Benzene		Ø.ØØØ1	ø.ø20 ø.ø81	98.
Toluene		Ø. ØØ1	Ø.Ø17	98.
Ethylbenzene		Ø.ØØ1	Ø. 1Ø	98.
Kylenes	4	Ø.ØØ1	not spiked	
1,2-Dichloroethane		Ø. ØØØ1	<u>-</u>	
Ethylene Dibromide	(EDB)	Ø . ØØØ1	not spiked	
TOTAL PURGEABLE PE (GASOLINE)	TROLEUM	HYDROCARBONS Ø.Ø	5 Ø.7	166.
BTX as a Percent o	f Fuel		31.	

\*(Practical Quantitation Limit)

MSD/6 \$4/24/89 QS#42#9f.wr1/53 MH/jg/jc/tl

Respectfully submitted, CENTRAL COAST ANALYTICAL SERVICES

Mary Havlicek, Ph.D.

PR	OJEC	T NAM	E / LC	CATION		PROJECT NUMBER: 40-88-666	BORING NUMBER: M	W-3 S	HEET	1 (	F	2
34	20 S	an Pa d, CA	blo Av	enue		CONTRACTOR: West Hazmat		DRILLIN METHOD:	KG	H.S.A.		
•	, La	u, u				DRILLER: Randy Re	eidhead	DRILLIN RIG:		ME-55		
						START: 11:00/4-1	LO-89	COMPLET	TED:	L:00/4-	-10-	-8
OW	ND NER:		ell Oi	1 Comp	any	SURFACE ELEVATION: 100.00	(relative)	LOGGED Hal	BY: Hanse	∍n		
SAYP MPL E	S N A U	COUNTS BLOW	S I A N P P L	RECOV-	Portone I	DECENTEMENT OF MA	TYPE	CONTAMI OBSERVA		GENI	RAI	٠.
PE	PB	M M	P	PO	DEPIH SCALE	DESCRIPTIONS OF MAI AND CONDITIONS	ERLALS	INSTRUM	ÆNT:	OBSERY NO	ES	·C
Ē	ĒŔ	ŝ	Ē(ft)	Ē(in)	1"= 4'			UNITS:	Tip			
					1	ASPHALIT AND ROAD BAS			ŀ			
					2 +	CIAY; very dark gray plastic, slightly mo no sand (CH)	, highly -					
					3 + 3	no sand (CA)	•		,			
					4 +							
CA	MW3 -1	8/	5.0-	18	5 🕂			0		No ode	or	
	-1	8/ 13/ 13	6.5		6	SILTY CLAY; olive br	own with		ŀ			
					7 🕂	SILTY CLAY; olive br light olive brown mo moderately high plas slighty moist (CL)	sticity, —		İ			
			-		8 —	eridich moist (CP)	-		- 1			
					9 🕂		_					
CA	MW3 -2	13/ 23/ 21	10.0- 11.5	18	10 🕂		<del></del>	0	İ	No ode	or	
	-4	วิปั			11 —							
					12 —							
					13 🕂							
					14	SANDY CLAY: vellowis	sh brown.					
CA	MW3 -3	11/ 14/ 15	15.0- 16.5	17	15	SANDY CLAY; yellowis moderately low plast moist, fine sands	icity, –	0	ĺ	No odo	or	
		15			16 🛨		·/	•				
					17 🕂							
				,	18 —		<del></del>	!				
					19 🕂							
CA	MW3	3/8/	20.0- 21.5	15	20 —			0		No odd	r	
					21 +		****					
					22 +		-					
					23 +							
	WA	IER L	EVEL D	ATA	PROFESS:	IONAL GEOLOGIST		<u> </u>				
DA'	ΤΈ	T										
TU	ME				CTMBMT							
GW	L,				SIGNATUR	<u> </u>						
CA	SING PIH				TYPED NAI	VIE:						
100	- 111	<u> </u>			TIPED NAME	yie.						

CCAS

Central Coast

Lab Number:

S-#42#9-2

Analytical Services, Inc. 141 Suburban Road , Suite C-4

Collected: Received: Tested:

**64/2**6/89

San Luis Obispo, California 934#1 (8#5) 543-2553

Collected by:

Fuel Fingerprint Analysis - EPA Method 8269

EXTRACTED BY EPA METHOD 5#3# (purge-and-trap)

SAMPLE DESCRIPTION:

STD.1/2 X (#642689-4) BTE, EDB & EDC e \$.\$2\$ ppm, Xylenes € \$.\$6\$ ppm

Compound Analyzed	Detection Limit in ppm (PQL)*	Concentration w/spike in ppm	Percent Recovery
Benzene	ø.øøø1	ø.ø23	115.
Toluene	Ø. ØØ1	Ø. Ø24	12Ø.
Ethylbenzene	Ø.ØØ1	Ø. Ø22	110.
Xylenes	Ø.ØØ1	ø.ø69	115.
1,2-Dichloroethane (EDC)	Ø.ØØØ1	Ø.Ø23	115.
Ethylene Dibromide (EDB)	Ø. 9991	Ø.Ø26	13Ø.
TOTAL PURGEABLE PETROLEUM (GASOLINE)	HYDROCARBONS Ø.Ø		licable
BTX as a Percent of Fuel			olicable
Percent Surrogate Recovery	,	99.	
		**************	********
*(Practical Quantitation	Limit)		

\*(Practical Quantitation Limit)

MSD#8 **#4/24/89** S#42#9f2.wr1/53 MH/ec/jc/tl

Respectfully submitted,

CENTRAL COAST ANALYTICAL SERVICES

Mary Haviicek, Ph.D.

PR	OJEC	T NAM	E / IC	CATION		PROJECT NUMBER: 40-88-6	BORING NUMBER:	MW-3	SHEET	2 (	OF 2
34 Oa	20 S klan	an Pa d, CA	blo Av	enue		CONTRACTOR: West Hazmat	: Drilling	DRILL METHO	D: H	.s.a.	
		•				DRILLER: Randy	Reidhead	DRILL RIG:	ING C	ME-55	
<u></u>						START: 11:00/4	l <b>-</b> 10-89	COMPL	ETED:	1:00/4	-10-89
떲	NER:		ell Oi	l Compa	ny	SURFACE ELEVATION: 100.5	50' (relative	) LOGGE	D BY: al Han	sen	
STAY	SNAU	BLOW TS	SIAN	S R M C P O L V					MINANI NOTTAV	GENI	RAL
SAYP MPE L	M M P B	Ō Ŭ W N	SI AN MT P	M C P O		DESCRIPTIONS OF AND CONDITE	MATERIALS ONS	<b></b>	LMENT:	OBSER	MOITAN
L E	LER	TS	L E(ft)	E(in)	SCALE 1"= 4'			UNITS			lor
					23			1			
					24	<del></del>					
CA	MW3 -5	25/	25.0-	14	25 + G	RAVELLY SAND; br and, gravel, sat inor plastic fir	own, coarse urated,	40	:	No oda	or
	-5	25/ 25/ 42	26.5		26 — m	unor plastic fir	nes (SW) —	-	:		
					27 🕂			1			
					28 —			}			
					29 🕂		•	}			
CA	₩3 <del>-6</del>	18/ 23/ 39	30.0- 31.5	15	30 — T	otal Depth 30.0	feet.	- 0		No odd	or
		39			31 🛨		•				
					32 —			†			
					33 —		-	4			
					34			-			
					36—			]			
				Ì	37 —		-	]			
					38 —		_	<u> </u>			
					39 井						
					40 —			1			
					41 -		_	1			
					42 —		<del></del>	1			
					43 —		_	]			
					44 —			-			
					45 —		-	1			
	WAY	ER L	EVEL D	ATA	PROFESSIO	ONAL GEOLOGIST	<del></del>	1		L	
DA	Œ										
TI	Œ				SIGNATURE						
GW		<u> </u>									
CAS	ING PIH				TYPED NAMI	₹					
		1						*****			

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Central Coast Analytical Services, Inc. 141 Suburban Road , Suite C-4

San Luis Obispo, California 934#1 (895) 543-2553

Lab Number: F-#4547 Collected: Ø4/1Ø/89 #4/13/89 Received:

**64/26/89** Tested: Collected by: H. Hansen

Fuel Fingerprint Analysis - EPA Method 826# EXTRACTED BY EPA METHOD 5#3# (purge-and-trap)

Hal Hansen ATTN: Delta Environmental 11939 White Rock Rd.

SAMPLE DESCRIPTION: Oakland Shell, MW-4-2, #49-88-666.#1, Soil

Suite 11# Rancho Cordova, CA 9567€

Compound Analyzed	Detection Limit in ppm (PQL)*	Concentration in ppm
		and Sound
Benzene	Ø. ØØ2	not found
Toluene	Ø. ØØ2	Ø.ØØ5
Ethylbenzene	Ø.ØØ2	Ø. ØØ4
Xylenes	Ø.ØØ2	Ø. Ø31
1,2-Dichloroethane (EDC)	Ø.ØØ2	not found
Ethylene Dibromide (EDB)	Ø.ØØ2	not found
TOTAL PURGEABLE PETROLEUM HYDROCARBO	NS Ø.2	<ø.2
BTX as a Percent of Fuel		not applicat
Percent Surrogate Recovery		1Ø5.
*************	***********	*********
*/Proctical Quantitation limit)	· · · ·	

\*(Practical Quantitation Limit)

MSD#6 **64/24/89** F#4547f.wr1/54 MH/jg/jc/tl

Respectfully submitted, CENTRAL COAST ANALYTICAL SERVICES

Mary Haviicek, Ph.D.

P	OJEC	T NAM	E / LO	CATION		PROJECT NUMBER: 40-88-6	BORING NUMBER:	MW-4 SHEET	1 OF 2	
34	120 S	an Pa d, CA	blo Av	enue		CONTRACTOR: West Hazmat	: Drilling	DRILLING MEIHOD:	H.S.A.	
"	, a	u, us	•			DRILLER: Randy R	DRILLER: Randy Reidhead		CME-55	
						START: 2:30/	′4 <b>–10–</b> 89	COMPLETED:	6:30/4-10-89	
ON	ND NER:			Сопра	ıy .	SURFACE ELEVATION: 99.0	3' (relative)	LOGGED BY: Hal Hans	en	
SIAY	SNAUMM	BLOW HS	S I A N M T P L E(ft)	S R M C P C L	DEPIH	DESCRIPTIONS OF	MATERTALS	CONTAMINANT OBSERVATION	GENERAL OBSERVATION	
S T M F P E	P B L E E R	W N T S	P L E(ft)	P O L V E(in)	SCALE 1"= 4'	AND CONDITI	ONS	Instrument: Units:	NOTES	
						SPHALT AND ROAD	BASE -			
					1 +	FAN CLAY; very d	ark gray, -			
					2 — h	EAN CLAY; very d lighly plastic, s poist, no sand	(CE) -			
					4					
CA	MW4	17/	5.0	18	5			7	Slight odor	
	-1	25/ 32	6.5		6 + 8	IIIIY CLAY; dark ray, medium plas lightly moist, s	greenish -	'		
					7 + Š	lightly moist, s CL)	ome gravel -			
			**		8 — — `	•				
					9 —					
CA	MW4	6/8/ 12	10.0-	17	10 + S	ILITY CLAY; dark rown, dark green offics, moderate	yellowish ish-gray, —	0	No odor	
	-2	12	11.5		11 - "	ottles, moderate bist (CL)	TA brazero, -			
					12 —					
					13 —		-			
					14 —	31574 Of 316				
CA	MW4 -3	8/9/	14.0-	17	15 - 1	ANDY CLAY; yello oderately plasti ine sand, grades and at the botto	wish prown, - c, moist, -	0	No odor	
	-3	12	16.5		16 — s	ine sand, grades and at the botto	m of the —			
			•		17 + u	nit (CL)				
					18 —					
					19 🕂					
CA	MW4	9/8/ 24	20.0-	15	20 —			0	No odor	
		24	21.5		21 -					
					22 —					
					23 🕂					
	WAY	TER L	EVEL D	ATA	PROFESSI	ONAL GEOLOGIST		<u> </u>		
DA	TE	T	<u> </u>		<del> </del>					
TI	ME	1			<b></b>					
GW	L				SIGNATURE	•				
	SING						i			
السي	PIH	<u> </u>			TYPED NAM	<u> </u>	<u> </u>			

Central Coast Analytical Services, Inc. 141 Suburban Road , Suite C-4

Collected: Received:

Lab Number:

F-\$4546 **#4/1#/89** Ø4/13/89

San Luis Obispo, California 934#1 (895) 543-2553

Ø4/2Ø/89 Tested: Collected by: H. Hansen

Fuel Fingerprint Analysis - EPA Method 8269

ATTN: Hal Hansen Delta Environmental 11939 White Rock Rd. EXTRACTED BY EPA METHOD 5#3# (purge-and-trap) SAMPLE DESCRIPTION:

Oakland Shell, MW-3-2, #49-88-666.\$1, Soil

Suite 115 Rancho Cordova, CA 9567€

Compound Analyzed	Detection Limit in ppm (PQL)*	Concentration in ppm
Benzene	ø.øø2	not found
Toluene	Ø.ØØ2	Ø. Ø1Ø
Ethylbenzene	Ø.ØØ2	Ø.ØØ8
Xylenes	Ø.Ø <b>Ø</b> 2	Ø.Ø69
1,2-Dichloroethane (EDC)	Ø.ØØ2	not found
Ethylene Dibromide (EDB)	Ø.ØØ2	not found
TOTAL PURGEABLE PETROLEUM HYDROCARBO (GASOLINE)	INS Ø.2	<ø.2
BTX as a Percent of Fuel		not applicab
Percent Surrogate Recovery		112.
	s 被 急 物 海 和 自 点 基 并 点 思 梦 非 思 用 思 非	· ** ** ** ** ** ** ** ** ** ** ** ** **
*(Practical Quantitation Limit)		

MSD#6 **#4/24/89** F#4546f.wr1/54 MH/jg/jc/tl

Respectfully submitted, CENTRAL COAST ANALYTICAL SERVICES

Mary Havlicek, Ph.D.

PRO	JEC	T NAM	E / LO	CATTON		PROJECT NUMBER: 40-88	3-666	BORING NUMBER:	MW-4	SHEET	. 2	OF	2
342	0 S	an Pa d, CA	blo Av	enue		CONTRACTOR: West Hazi	nat Dr	rilling	DRILL METHO	ING D:	H.S.A.		
·	Tail	u, Ca				DRILLER: Ran	ly Rei	dhead	DRILI RIG:	ING	CME-55		
						START: 2:30	)/4-10	-89	COMPL	ETED:	6:30/	4-10	-89
LAN OWN	ER:			1 Compa	any	SURFACE ELEVATION: 99	.03 (	relative)	LOGGE	D BY: Hal Ha	ınsen		
S T M P P E L	S A M B E C	BLOWERS	S I A N M T P L E(ft)	SAECOV.	SCALE	DESCRIPTIONS ( AND COND	OF MAT	ERIALS	OBSER	MINANI VATION LIMENT:	GEN OBSER NC	TES	ON
E	ER	S	E(It)	Ē(in)	1"= 4'				UNITS	•	c	dor	
CA.	<b>M</b> W4 <b>-</b> 5	25/ 24/ 30	25.0- 26.5	16	27	RAVELLY SAND; and, saturated o 1", some pla	brown l, gra stic	, coarse	O		No cd	or	3
CA.	MM4 6	19/ 22/ 37	30.0- 31.5	17	28 ————————————————————————————————————	otal Depth 31.	 5		0		No cd	or	
					34 ————————————————————————————————————								
					39 — 40 — 41 — 42 — 43 —			1. 1. 1. 1.					
		j			44 +++								
<u>                                     </u>	NIP.	VETC	7 may 500	\max	<u></u>	WIT STATES		-					
DATE		EK IA	VEL D	ALE	PROFESSIO	NAL GEOLOGIST	4						
TIME	_												
GWIL			1		SIGNATURE								
CASI DEP	ING IH				TYPED NAME	2	_						

Central Coast Analytical Services, Inc. 141 Suburban Road , Suite C-4 San Luis Obispo, California 934Ø1

(805) 543-2553

F-64545 Lab Number: Ø4/1Ø/89 Collected: Ø4/13/89 Received: Tested:

**94/29/89** Collected by: H. Hansen

Fuel Fingerprint Analysis - EPA Method 826# EXTRACTED BY EPA METHOD 5636 (purge-and-trap)

ATTN: Hal Hansen Delta Environmental 11839 White Rock Rd. Suite 115

SAMPLE DESCRIPTION: Oakland Shell, MW-2-2, #46-88-666.f1, Soil

Rancho Cordova, CA 95676

Compound Analyzed	Detection Limit in ppm (PQL)*	Concentration in ppm
######################################		
Benzen <del>e</del>	ø.2	Ø.4
Toluene	Ø.2	1.5
Ethylbenzene	Ø.2	1.7
Xylenes	Ø.2	15.
1,2-Dichloroethane (EDC)	Ø.2	not found
Ethylene Dibromide (EDB)	Ø.2	not found
TOTAL PURGEABLE PETROLEUM HYDR (GASOLINE)		76.
BTX as a Percent of Fuel		24.
Percent Surrogate Recovery		107.
<b>建全面位的自然的实现在是实现在是实现在是实现的现在分词</b>	*************	***********
"(Proceed and Oughtstation Limit	<b>-</b> 1	

\*(Practical Quantitation Limit)

MSD#6 \$4/24/89 F#4545f.wr1/54 MH/jg/jc/tl

Respectfully submitted, CENTRAL COAST ANALYTICAL SERVICES

Mary Havlicek, Ph.D.

## EXPLORATORY BORING LOG

ensco environmental services, inc.

PROJECT NAME: SHELL STATION

3420 SAN PABLO AVE. OAKLAND, CA

DATE DRILLED: 8/8/88

PROJECT NUMBER: 1859G

LOGGED BY: RAG

BORING NO. B+1

				PHOJECT NOMBER. 1000C				
DEPTH (ft.)	SAMPLE No	BLOWS/F00T 140 fl/lbs.	UNIFIED SOIL SLASSIFICATION	SOIL DESCRIPTION	WATER LEVEL	OVA READING	mød	
				Asphalt - 2°, baserock - 4°				I
2 -			CL	SILTY CLAY, very dark gray (7.5YR 3/0), slight petroleum odor, moderately high plasticity, stiff, moist				
4 [	i				1	1		
5	B-1-1	27	СН	SILTY CLAY, dark gray (10YR 4/1), some angular brown gravel sized fragments, petroleum odor, moderately high plasticity, very stiff, moist,		15	55	
- 7 - 8 -			CL	SILTY CLAY, olive gray to gray (5Y 5/2 to 7.5Y 5/0), localized fine grained sands, some angular gravel up to 1.5° across, petroleum odor, moderate plasticity, very stiff, moist				
	]							
	  B-1-2	32		·	1	1	50	
10	5-1-2	32			1			
t	1	l	1		1			] ]
Ι	]		1			1		
- 12	-		1					
<b>h</b>	1		ļ	·	]		-	
13	] .		<u> </u>	SANDY CLAY, mottled browns (10YR 5/4 to 10YR				
14	Ч		CL	5/8), some fine to medium sands and angular, medium				
ł	H			gravels, no petroleum odor, stiff, moist to very moist				
15	B-1-3	13					0	
16	4							
<b>-</b>	1							
L 17	1			SILTY CLAY, mottled reddish yellow to light yellow			İ	
18			CL	(7.5YR 6/8 to 2.5Y 6/4), locally sandy areas, some gravels, no petroleum odor, very stiff, moist to very		,		
19	4			moist 8/8/88, Groundwater		4		
20			1	encountered - 19 ft.				
-	B-1-	4 32		Bottom of boring =20.5 feet	-		0	
21	٦				_	1_	ļ	

SUPERVISED AND APPROVED BY R.G./C.E.G.

Central Coast Analytical Services, Inc. 141 Suburban Road , Suite C-4

San Luis Obispo, California 934#1 (895) 543-2553

Lab Number: F-94544 Collected: Ø4/11/89 Received: Ø4/13/89 Tested: Ø4/2Ø/89 Collected by: H. Hansen

Fuel Fingerprint Analysis - EPA Method 826# EXTRACTED BY EPA METHOD 5030 (purge-and-trap)

ATTN: Hal Hansen Delta Environmental 11535 White Rock Rd.

Suite 115

Rancho Cordova, CA 9567₽

SAMPLE DESCRIPTION: Oakland Shell, MW-1-2, #49-88-666.91, Soil

Compound Analyzed	Detection Limit in ppm (PQL)*	Concentration in ppm
Benzene	Ø.Ø5	not found
Toluene	Ø.5	1.9
Ethylbenzene	Ø.5	1.9
Xylenes	Ø.5	16.
1,2-Dichloroethane (EDC)	Ø.5	not found
Ethylene Dibromide (EDB)	Ø.5	not found
TOTAL PURGEABLE PETROLEUM HYDR (GASOLINE)	OCARBONS 5Ø.	8ø.
BTX as a Percent of Fuel		22.
Percent Surrogate Recovery		110.
*****************	=======================================	*****

\*(Practical Quantitation Limit)

MSD#B \$4/24/89 F#4544f.wr1/54 MH/jg/jc/tl

Respectfully submitted, CENTRAL COAST ANALYTICAL SERVICES

Mary Havlicek, Ph.D.

### **EXPLORATORY BORING LOG**

ensco environmental services, inc.

PROJECT NAME: SHELL STATION

3420 SAN PABLO AVE.

OAKLAND, CA

DATE DRILLED: 8/8/88

PROJECT NUMBER:1859G

LOGGED BY: RAG

BORING NO. B-2

				PROJECT NUMBER: 1009G	الاكتاف	. 1740	
DEPTH (A.)	SAMPLE No	BLOWS/F00T 140 ft/lbs.	UNIFIED SOIL	SOIL DESCRIPTION	WATER LEVEL	OVA READING ppm	·
				Asphalt - 2°, baserock - 9°		1   1	ı
2 -			СН	SILTY CLAY, very dark gray (7.5 3/0), some fine grained sands and gravels, moderately high plasticity, petroleum odor, stiff, moist			
					1		
5	B-2-1	30	CL	SILTY CLAY to SANDY CLAY, gray (2.5Y 5/0), fine grained sands, some subangular gravels up to 0.5° across, petroleum odor, very stiff, moist		230	
- 8 - 9 - 10	B-2-2	30	CL.	SILTY CLAY, mottled light gray to grayish brown (7.5YR 6/0 to 10YR 5/2), some medium to coarse encountered - 8 grained sands and gravels up to 0.5" across, petroleum odor, very stiff, moist	i ft.	210	
<b>!</b>	3.2.2	30		Bottom of boring = 10.5 feet			
<b>L</b> 11	1			Bottom of boning - 10.0 100.			
- 12	•	i		•			
<b>!</b>	1				1	-	
13							
14	1						
15	]						
<b>L</b>	<u> </u>						
<b>F</b> . ' '	-						
17	1						
- 18	-				ł		
19	1						
<b>+</b>	-						
20	]						
21	-{			·			1

SUPERVISED AND APPROVED BY R.G./C.E.G.

Central Coast Analytical Services, Inc. 141 Suburban Road , Suite C-4 San Luis Obispo, California 934#1

(8#5) 543-2553

Lab Number: F-94543 \$4/11/89 Collected: Received: **#4/13/89** \$4/23/89 Tested: Collected by: H. Hansen

Fuel Fingerprint Analysis - EPA Method 826#

ATTN: Hal Hansen Delta Environmental EXTRACTED BY EPA METHOD 5636 (purge-and-trap) SAMPLE DESCRIPTION:

11636 White Rock Rd.

Oakland Shell, MW-1-1, #4#-88-666.#1,

Suite 115

Soil

Rancho Cordova, CA 9567€

Compound Analyzed	Detection Limit in ppm (PQL)*	Concentratio in ppm	
Benzene	ø.2	1.2	
Toluene	Ø.2	14.	
Ethylbenzene	Ø.2	19.	
Xylenes	Ø.2	1ØØ.	
1,2-Dichloroethane (EDC)	ø.2	not found	
Ethylene Dibromide (EDB)	ø.2	not found	
TOTAL PURGEABLE PETROLEUM HYDR (GASOLINE)	OCARBONS 20.	85Ø.	
BTX as a Percent of Fuel		14.	
Percent Surrogate Recovery		93.	

\*(Practical Quantitation Limit)

CENTRAL COAST ANALYTICAL SERVICES MSD#7 #5/#1/89

F#4543f.wr1/55

MH/jl/re/tl

lausi

Respectfully submitted,

Mary Havlicek, Ph.D.

## EXPLORATORY BORING LOG

ensco environmental services, inc.

PROJECT NAME: SHELL STATION

3420 SAN PABLO AVE.

OAKLAND, CA

DATE DRILLED 8/8/88

B-3

BORING NO.

PROJECT NUMBER: 1859G

LOGGED BY: RAG LASSIFICATION BLOWS/F001 SAMPLE No OVA READING 140 ft/16s. WATER LEVEL DEPTH (A. UNIFIED SO SOIL DESCRIPTION Asphalt - 2°, baserock - 6° SILTY CLAY, very dark gray (7.5YR 3/0), localized CH fine grained sands, no petroleum odor, moderately high plasticity, stiff, moist SILTY CLAY, mottled strong brown to brownish B-3-1 30 0 yellow (7.5YR 6/6 to 7.5YR 6/5), localized fine CH grained sands and angular to subangular gravels up to 0.5° across, no petroleum odor, moderately high plasticity, very stiff, moist 10 B-3-2 25 O 11 13 SANDY CLAY, mottled brownish yellow to yellowish CL brown (10YR 6/6 to 10YR 5/8), fine grained sands. no petroleum odor, stiff, moist to very moist 15 B-3-3 16 16-SANDY CLAY to CLAYEY SAND, mottled light gray to CLdark brown (10YR 7/1 to 10YR 3/8), fine grained 17 SC sands up to 60%, no petroleum odor, stiff to medium dense, wet 18-19 8/8/88, Groundwater encountered - 19 ft. B-3-4 16 0 Bottom of boring = 20.5 feet

SUPERVISED AND APPROVED BY R.G./C.E.G.

AIR, WATER & HAZARDOUS WASTE LABORATORY (No.131) CERTIFIED by CALIFORNIA DE TOERE E POPE

Central Coast Analytical Services

ATTN: Hal Hansen Delta Environmental

11939 White Rock Road

Rancho Cordova, CA 9567€

Central Coast
Analytical Services
141 Suburban Road, Suite C-4
San Luis Obispo, California 934#1
(8#5) 543-2553

Lab Number: Collected: As Links

8 1989

Received:

As lasted

\$4/|3/89 @ \$9\$\$ As Listed

May

Tested: As Listed Collected by: Hal Hansen

Sample Description:

Oakland Shell, Project #46-88-666-61

Soil Samples As Listed

DIGESTED BY EPA METHOD 3656 ON 64/22/89 BY JJ.

REPORT

LAB NUMBER

Suite 115

SAMPLE DESCRIPTION

LEVEL FOUND

TOTAL LEAD mg/kg

EPA METHOD----DETECTION LIMIT(PQL)\*\*--DATE/ANALYST----\*\*\*TTLC-----

1. Ø4/27/89/RJ 1ØØØ.

742Ø

F-4543

MW-1-1, Coll: 94/11/89

4.

F-4544

MW-1-2, Coll:  $\emptyset 4/11/89$ 

3.

F-4545

MW-2-2, Coll: Ø4/1Ø/89

8.

F-4546

MW-3-2, Coll: Ø4/1Ø/89

3.

F-4547

MW-4-2, Coll: Ø4/1Ø/89
DUPLICATE-----

2.

001 C

2. 98. Percent

Recovery

\*\*Practical Quantitation Limit

\*\*\*TOTAL THRESHOLD LIMIT CONCENTRATION as listed in 22 Cal Adm Code Art 11 Sec. 66699 as persistent & bioaccumulative toxic substance.

#4/28/89 F4543DL.WR1/#41 MH/ke Respectfully submitted, CENTRAL COAST ANALYTICAL SERVICES

Mans Carley Mary Havlicek, Ph.D., President

## EXPLORATORY BORING LOG

ensco environmental services, inc.

PROJECT NAME: SHELL STATION

3420 SAN PABLO AVE.

OAKLAND, CA

DATE DRILLED: 8/8/88

BORING NO.

B-4

LOGGED BY: RAG PROJECT NUMBER: 1859G LASSIFICATION OVA READING WATER LEVEI BLOWS/F00T UNIFIED SOIL SAMPLE No 140 ft/lbs. DEPTH (11.) mdd SOIL DESCRIPTION Asphalt - 2°, baserock - 4° SILTY CLAY, very dark gray (7.5YR 3/0), localized fine grained sands, no petroleum odor, moderately high CH plasticity, stiff, moist SANDY CLAY, mottled gray to strong brown 5 (7.5YR 5/0 to 7.5YR 5/6), fine to medium 0 B-4-1 24 grained sands up to 40%, angular to subangular CL gravels up to 0.5" across, locally very sandy and gravelly, no petroleum odor, very stiff, moist SANDY CLAY, mottled brown to yellowish brown (10YR 5/3 to 10YR 5/6), fine grained sand, locally CL very sandy and very clayey, no petroleum odor, 10 hard, moist B-4-2 35 0 12-13-Localized very gravelly beds, very stiff 15 B-4-3 18 0 Root holes containing free water 16-17 18 8/8/88. Groundwater encountered - 19 ft. 19 20 0 30 Bottom of boring = 20.5 feet

SUPERVISED AND APPROVED BY R.G./C.E.G.

#### APPENDIX D

Laboratory Reports

#### EXPLORATORY BORING LOG

ensco environmental services, inc.

PROJECT NAME: SHELL STATION

3420 SAN PABLO AVE.

OAKLAND, CA

BORING NO. B-5

DATE DRILLED: 8/8/88

PROJECT NUMBER: 1859G

LOGGED BY: RAG

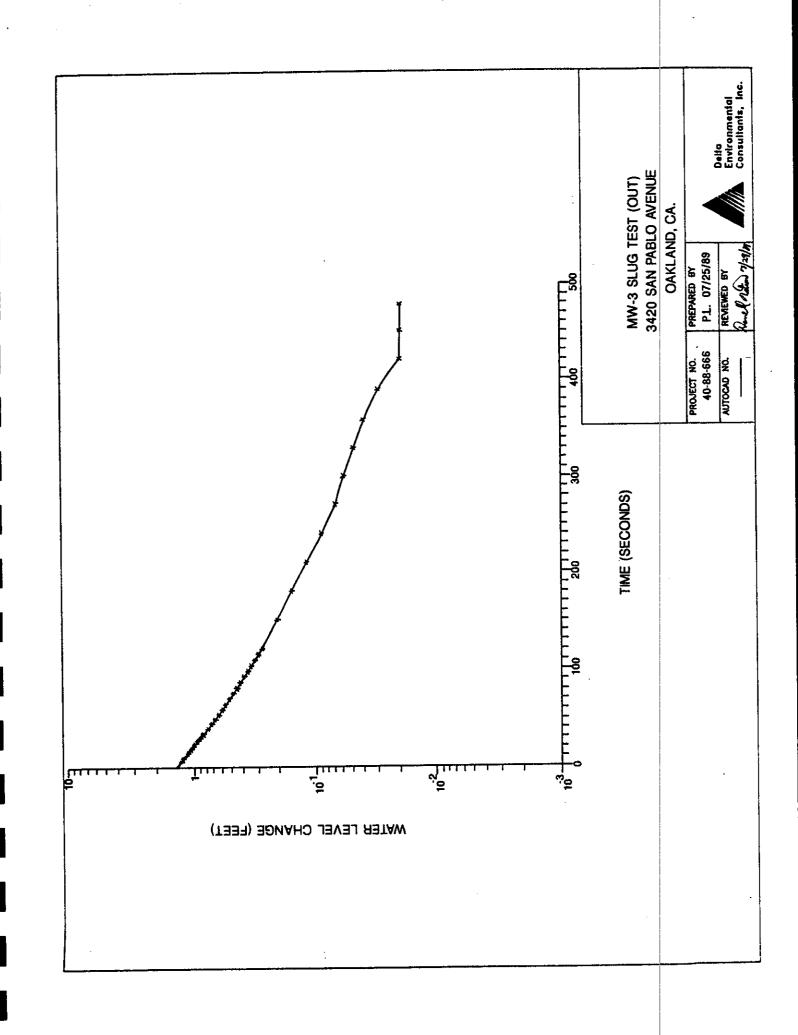
			وحندين		-		
DEPTH (ft.)	SAMPLE No	BLOWS/FOOT 140 ft/lbs.	UNIFIED SOIL	SOIL DESCRIPTION	WATER LEVEL	OVA READING ppm	
				Asphalt - 2°, baserock - 4°		Ť	
- 1 -		•	СН	SILTY CLAY, very dark gray (7.5YR 3/0), localized fine grained sands, no petroleum odor, moderately high plasticity, stiff, moist			
4 -				·			
- 5 - 6 -	B-5-1	28	CL	SANDY CLAY, mottled grayish brown to yellowish brown (10YR 5/2 to 10YR 5/6), fine to coarse sand up to 40%, locally abundant gravels up to 0.5° across, no petroleum odor, very stiff, moist	·	0	
-8 -	<b>!</b>						]
9 10	B-5-2	38	CL	SANDY CLAY, mottled gray to brownish yellow (10YR 6/1 to 10YR 6/6), fine grained sands up to 30%, root holes, no petroleum odor, low plasticity, hard, moist		0	
- 12- - 13-						-	
- 14 - 15 - 16-	8-5-3	. 13	CL	SANDY CLAY, mottled yellow browns (10YR 5/4 to 10YR 5/8), fine grained sands up to 40%, locally abundant gravels up to 0.5° across, no petroleum odor, stiff, moist to very moist, free water in root holes		0	
- 18- - 19 - 20	B-5-4	23		8/8/88, Groundwater  Decreasing sand, very stiff  encountered - 19 ft.	V	0	
21 .				Bottom of boring = 20.5 feet	1		
		<u> </u>	1 .	I	1	I	سيسبيك

SUPERVISED AND APPROVED BY R.G./C.E.G

```
C:\SLUG>SLUGTEST
 lug test for Hydraulic Conductivity
   of Unconfined Aquifer
Input Project Name:
OAKLAND SHELL
hput: 1= Partially Penetrating
      2= Fully Penetrating
 hput:Well I.D.
E-WM
 #=====
Input: Screen length(ft)
      Depth to Bottom of Well(ft)
       Depth to water table or flow zone(ft)
      Depth to Bottom of Aquifer(ft)
20,27.5,8.59,50.
ter level below top of screen - need adjusted ro
hput: Casing Radius(in), & Well Radius(in)
\bar{2}, 3.20
                                   2.666667E-001 ft
       1.666667E-001 ft
                           rw =
               74.9999900
L/rw =
                               6.627519E-001 = b
         3.8090060 = a;
                       Screen length =
                                               20.0000000
Height of water above bottom of well =
                                               18.9100000
                                               -1.0900000
Height of water above top of screen =
                                               41.4100000
          Total depth of water table =
Input drawdown time data: yo,to,yf,tf (ft and min)
1.,.33,.69,.83
     .472E+01
                                    .753E-03
Hydraulic Conductivity (cm/sec) =
                                    .213E+01
                       (ft/day) =
     Transmissivity (ft sq/day) =
                                    .883E+02
1= new type, 2= new well, 3= more data, 4=end
```

#### APPENDIX B

Monitoring Well Construction Diagrams



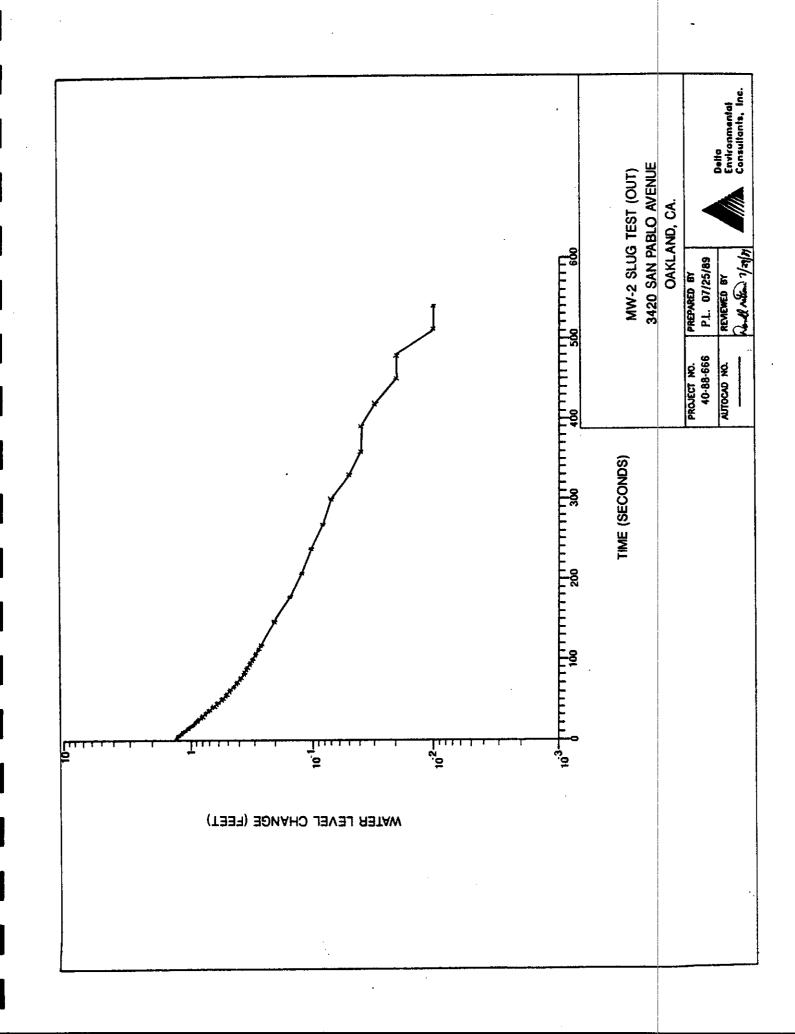
# INSTALLATION OF FLUSH GRADE MONITORING WELL

PROJECT <u>Oakland Shell</u>			TIONS: TOP	OF RISER	100 0 relative
DELTA NO. 40-88-666	LENG THICKNESS AND T	CAP ELL CONSTRUCTION FER AND MATERIAL TOTAL LENGTH TH ABOVE GROUND TYPE OF SEAL	15-ir 12 ir 0 foo 18 ir	nch galvanches	nized
-	DIAMETER, MATERIAL AND		<u>Flush</u>	-threade	
	THICKNESS AND TYPE OF  BISTANCE OF FILTER SAI  TYPE OF FILTER AROUND  HONITORING VELL HATER  SCREEN GAUGE OR SIZE  BIAMETER AND LENGTH O	NO ADDIVE TOP OF S SCREEN  TAL  OF OPENINGS CSLUT	2 fee 16/40 PVC S size 0.01	et ' Clement CH 40	nite pellets ine
	— DEPTH TO THE BOTTON O  — DEPTH TO THE BOTTON O  — THICKNESS AND TYPE OF  — STANETER OF BOREHOLE	F FILTER SAND	25 fe 25 fe N/A 10 in	et	
0.25 5 20 1.3 = 25	r. r.	MONITORING W DATE 4-17-1989	/ELL VATER L TIME 13:25		
DATE 4-11-1989 TIME 10:30		Delte Environmentel Consultants, inc.	HEASURE POINT:	Top of	Casing

```
UGTEST
 lug test for Hydraulic Conductivity
       of Unconfined Aquifer
 hput Project Name:
 AKLAND SHELL
Input: 1= Partially Penetrating
       2= Fully Penetrating
Input: Well I.D.
 ======
 nput: Screen length(ft)
       Depth to Bottom of Well(ft)
       Depth to water table or flow zone(ft)
       Depth to Bottom of Aquifer(ft)
5,19,7.71,50
water level below top of screen - need adjusted ro
Input: Casing Radius(in), & Well Radius(in)
.3.20
                           rw =
                                   2.666667E-001 ft
       1.666667E-001 ft
               56.2500000
                                5.427318E-001 = b
         3.2205440 = a;
                                                15.0000000
                       Screen length =
eight of water above bottom of well =
                                                11.2900000
Height of water above top of screen =
                                                -3.7100000
          Total depth of water table =
                                                42,2900000
 hput drawdown time data: yo,to,yf,tf (ft and min)
96,.33,.575,.83
2e = .331E+01
                       (ft/day) = .122E-02
(sq/day) = .344F+0^{4}
ydraulic Conductivity (cm/sec) =
                                    .146E+03
     Transmissivity (ft sq/day) =
   new type, 2= new well, 3= more data, 4=end
```

## INSTALLATION OF FLUSH GRADE MONITORING WELL

PROJECT Oakland Shell		. MONITOR	IONS: T	OP OF	RISE	100.29	
DELTA NO. 40-88-666			G	ROUND	LEVE	<u> </u>	
	PROTECTIVE CASING	· I					
							· }
	- LOCKING VATER TIGHT C	AP .					Ì
	FLUSH GRADE VEI BIAMETI	LL CONSTRUCTION ER AND HATERIAL TOTAL LENGTH	$\frac{1}{1}$	5-inch 2 inch	galv	anized	
	l Dia	H ABOVE GROUND		foot			
	THICKNESS AND TO			8 inch	es, c	oncrete	
	- DIAMETER, NATERIAL AND .	JOINT TYPE OF RISE	R PIPE <u>4</u> _E	-inch lush-t	PVC S	CH 40 ed	
	- TYPE OF BACKFILL AROUS	O RISER	_ <u>C</u>	oncret	e wit	h 5% ben	tonite
	- THECKNESS AND TYPE OF					onite pe	llets
	- DESTANCE OF FILTER SAN	D ABOVE TOP OF SI	CREDO	feet	•	_	
十一	- TYPE OF FILTER ARRAND		<u> </u>	6/4U C	: I emen	tine	
	- HONETORING VELL HATER	IAL.	<u>P</u>	VC SCI	40	<u> </u>	<del></del>
	- SCREEN GAUGE OR SIZE !	OF OPENINGS (SLOT		-			
	- DIAMETER AND LENGTH DI	SCREEN	_4	inche	es 20	feet	—
	— вертн та тне заттом а	F HONITORING VELL	_1	9 feet	,		
	ם אמדדונו שוד מד אדיקטע -	F FILTER SAND	_1	9 feet	<u> </u>		
<b>——</b>	- THICKNESS AND TYPE OF	SEAL	_N	/A			
	- BLANETER OF BUREHOLE		_1	0 incl	nes		
L1 = 0.25 FT.		MONITORING V	ELL VAT	ER LEV	EL ME	ASUREMENT	2
L 2 = FT.		DATE	TIME	.   \	VATER	LEVEL =	
15		4-17-1989	13:15		6.46		
19 FT.							
DISTALLATION COMPLETED							
DATE: 4-10-1989 9:45	- -	Delte Environmental	MEASURE !	P00(T)	op of	casing	
1022 B/3-89		Consultants, inc.					



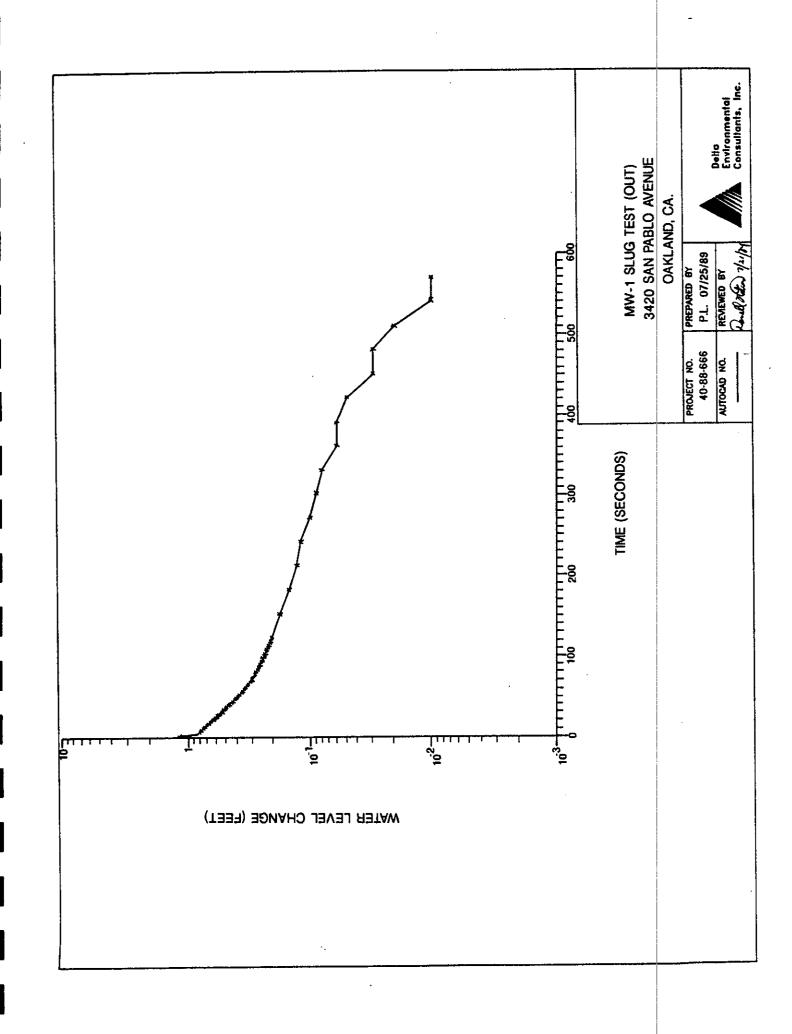
## INSTALLATION OF FLUSH GRADE MONITORING WELL

PROJECT Oakland Shell DELTA NO. 40-88-666		MONITOR ELEVAT	IONS: TOP	OF RISE		
		L CONSTRUCTION R AND MATERIAL TUTAL LENGTH H ABOVE GROUND PE OF SEAL	0 for 15-ii		rete CH 40	
	— TYPE OF BACKFILL AROUN	D RISER		n-thread rete wit	h 5% bent	onite
	- THECKNESS AND TYPE OF - BESTANCE OF FILTER SANS - TYPE OF FILTER AROUND - HONETORING VELL HATERIA	B ABOVE TOP OF SC SCREEN	2 fe/4		onite pel	lets
	<ul> <li>SCREEN GAUGE OR SIZE D</li> <li>→ DIAMETER AND LENGTH OF</li> </ul>		4 inc		feet	_
	DEPTH TO THE BOTTOM OF      DEPTH TO THE BOTTOM OF      THOCKNESS AND TYPE OF	FILTER SAND		feet feet		
	BIANETER OF BORDICLE		10_iı	nches		
L: = <u>0.25</u> FT		MONITORING V	ELL VATER I	EVEL ME	ASUREMENTS	<u></u>
Le = 7.5		DATE	TIME	VATER	LEVEL =	]
L3 = 20 FT.		4-17-1989	13:20	5.81		
DISTALLATION COMPLETED	,					
DATE 4-10-89 13:00	<del>-</del>	<u></u>	HEASURE POINT	Ton	of casing	-
1022 B/3-89		leite Invironmental Joneuitants, inc.	HEASURE PUINT		Casing	-

```
uqtest
 ug test for Hydraulic Conductivity
      of Unconfined Aquifer
 put Project Name:
 KLAND SHELL
Input: 1= Partially Penetrating
      2= Fully Penetrating
Input:Well I.D.
 =====
 eput: Screen length(ft)
      Depth to Bottom of Well(ft)
      Depth to water table or flow zone(ft)
      Depth to Bottom of Aquifer(ft)
 ,25,9.10,50
ter level below top of screen - need adjusted ro
Input: Casing Radius(in), & Well Radius(in)
3.20
      1.666667E-001 ft
                          rw = 2.66667E-001 ft
         74.9999900
        3.8090060 = a;
                             6.627519E-001 = b
                      Screen length =
                                             20.0000000
 ight of water above bottom of well =
                                             15.9000000
 leight of water above top of screen =
                                             -4.1000000
         Total depth of water table =
                                             40.9000000
 pput drawdown time data: yo,to,yf,tf (ft and min)
 3,.33,.42,.83
Re = .429E+01
 draulic Conductivity (cm/sec) =
                                   .108E-02
                       (ft/day) =
                                   .307E+01
    Transmissivity (ft sq/day) = .126E+03
  new type, 2= new well, 3= more data, 4=end
 \SLUG>
```

## INSTALLATION OF FLUSH GRADE MONITORING WELL

PROJECT Oakland Shell		MONITO ELEVA	IRING WELL	, NO. MW. P OF RISE	-4 	t i <b>v</b> ∈
DELTA NO. 40-88-666						
. 1077	PROTECTIVE CASING					
	- LOCKING VATER TIGHT CA					
	FLUSH GRADE VELL BIANETED	L CONSTRUCTION  R AND MATERIAL	15-	inch galv	<b>v</b> anized	
		TOTAL LENGTH		inches		
		ANOVE GROUND		oot		
	THICKNESS AND TYP	E OF SEAL	<u> 10-</u>	inch conc	rete	
	— DIAMETER, NATERIAL AND JO	UNIX TABE DE BIZ		nch PVC		
	The second section of the second	April ( ) and the ending	Elu	sh-thread	ded	
	- TYPE OF BACKFILL AROUND	/ RISER		Crete wil	th 5% bentonit	e
			2 f	ioot hon	tanita nallate	
	- THECKNESS AND TYPE OF S				t <mark>onite pellet</mark> s	
	- DISTANCE OF FILTER SAND	ABOVE TOP OF S	юкоо <u>2</u> f	eet '		1
	- TYPE OF FILTER AROUND S	ICREEN	16/	40 clemer	1.3	
	- MONUTURING VELL MATERIAL	1.		40 clemen SCH 40	ntine	1
		_				1
	- SCREEN GAUGE OR STZE OF		· ·			l
·	- DIAMETER AND LENGTH OF :	SCREEN	<u>4 iı</u>	nches 20	feet	ŀ
						l.
	- DEPTH TO THE BOTTON OF I	HONITORING VIELL	25	feet		i
						ı
	- DEPTH TO THE BOTTON OF I	FILTER SAMP	25_1	feet	<u> </u>	i
·	- THECKNESS AND TYPE OF SE	EAL	N/A		<u> </u>	i
			<del></del>			i
<del></del>	- DIAMETER OF BORDICLE		10	inches		í
	Г				<del></del>	1
L1 = 0.25	<u></u>	MONITORING V	/ELL VATER	LEVEL MEA	SUREMENTS	1
L2 = 5		DATE	TIME	VATER	LEVEL =	
L 3 - 20 FT	<u> </u>	4-17-1989	13:30	6.30	<del>  </del>	
25				+		
£ 4 • FT.						
DISTALLATION COMPLETED	-			Ţ		
BATE 4-10-1989	Ĺ				<u> </u>	
тесь	- <b>A</b> a.	<u></u>	HEASURE POINT	, Top of	casing	
1022 B/3-89	<b></b>	itta ivironmental insultants, inc.				



	ECHNOL ision of OII Recover				
,			Well Number MW 1		Drilling Lo
Project Arco/San	Pablo	Owner	Arco Petroleum	Sketch Map	
Location 3400 San					
			25 ft Diameter 8 in.		
			24-hra		
			Slot Size020		•
Casing: Dia 2 in	Length	5 ft	. Type PVC		
			Method H. S. Auger	Notes	
Driller L. Pera					
Depth (Feet) Welf Construction	· Nofes Sample Number	Graphic Log		oll Classification re, Structures)	
- 0 - 3	ID		Concrete Black clay, stiff, damp,	no odor	
- 3 - 8		CL	Green gray clay, stiff,	damp, moderate c	dor
- 5		CL	Brown silty clay, stiff,	damp, moderate	odor
- 7 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3	ppm .A 121	CL	Brown sandy clay; soft,	wet, pebbles, mo	derate odor
9	ppm A 12 16 27		Grey gravel and brown cla ▼7/31/86	ay, dry, crumbly	. moderate odor
-12 -	ppm 3 9 8 8 8 7 2	GC	Gray gravel in brown cla	y, soft, wet, no	odor .
15 16 17 18 19 19 20 21 21 -22		S. S. S. S. S. S. S. S. S. S. S. S. S. S	Brown silty clay, stiff,	dry, no odor	
23 – 24 – 25 – 25 – 2100144				Poge 1	

Page 1 of 1

## APPENDIX C

Slug Test Results



02100144

								•
		Division of C	II Recovery :			W 2	Di	illing Log
Project	Arco/	San Pablo			Arco Petroleum	Sk	etch Map	
					Number 20-8126			,
					25 ft. Dlameter 8 i	n.		
,					24-hrs			
Screen:	Dia.	2_in	. Length	20 ft	Slot Size0	20		•
Casing:	Dia.	2_in	Length	_5_£t	ТуреPV	<u> </u>		
Drilling	Company	<u>Sierra</u>	<u>Pacific</u>	_ Drilling	Method H. S. Auger	No	tes	
Driller .	<u>L. Pe</u>	<u>ra</u>		Log by	B. Channell			
Depth (Feet)	Well	Notes	Sample Number	Graphic Log		escription/Soil Cla Color, Texture, St		
- 0 -	1000 S	PID			Concrete Black clay, stif	E, dry, no c	xdor	
- 3 - - 4 - - 5 -				CL	Green gray clay,	stiff, camp	o, moderate odo	·
- 6 - - 7 - - 8 -					Brown clay, soft	, moist, peb	obles, moderate	odor
- 9 - -10 - -11 -		12 ppm	A 6		Brown silty clay ▼ 7/31/86	, stiff, poo pebbl	kets of water, es, no odor	minor
-12 - -13 - -14 - -15 -		7 ррт	B 3[		•			
16 - 17 - 18 - 19 - 20 -				CL	Brown silty clay	very stiff,	damp, no odor	
-22 - -23 - -24 - -25 -								

Page\_1

i

of\_

e: 11-14-86

Elevation.

OEPTH IN FEET	SAMPLE	LOG & SAMPLE	PENE RESIS. / FT.	DESCRIPTION	WELL [ #3 4"10-0.	SAND
				Existing Ground Surface	-	<del>        </del>
		55555		AC Pavement and Base	***	
<b> </b> 1 -		7,7,7,7		Black Silty Clayey Fill - Dry - No Odor		
- 2 -	  -   			Olive Silty Clay - Moist - Possible HC Odor		
- 5 -	; ,			Light Blue/Green Silty Clay - Moist - 5 No Odor	, -	
F 5 -	7-1	X	20	Lt.Green/Brown Silty Clay-Slight HC Odo		
- 7 - - 8 - - 9 - - 10 -				Light Brown Silty Clay - Moist - Slight HC Odor - Some Gravel	-	
- 11 - - 12 - - 13 - - 14 -				Brown Silty Clay w/ Less Gravel and Some Sand - Moist - No Odor		
- 15 17 18 19 20 21 22 23 25 26 27				Bottom of Boring at 15 ft.  20	-	

Figure 5 - Test Boring Log No. B-7

- Monitoring Well No. MW-7



02100144

	of Oil Reci				Drilling Log
<u></u>			We	11 Number — MW 3	Sketch Map
Project Arco/San Pa	blo		wner	Arco Petroleum	,
3//00 San Pa	blo Ave		ainet Ni	umber 20-8120	
Date Drilled 7/31/86	Total	l Depth of	Hole _	25 LL. Diameter O III.	·
Budana Slavetica	Wate	er Level, Ir	nitlal	24-hrs	·
- 2 in	Lane	20	) fr	Slot Size	
Caring Die 2 in.	Leng	jth	ft.	Type	Notes
Siet	ra racı	Ilc b	rilling M	eluog Titangarana	
Driller L. Pera		L	og by	B. Channell	
Depth (Feet) Well Construction		Sample	Graphic Log	Description/S	oil Classification re, Structures)
	<del> </del> -			Concrete	·
- 0 - ISI PII	P			Black clay, stiff, damp,	slight odor
- 1 - 25	15 pp	A	CL		lamp, minor gravel, moderate
- 4 - 3 - 4 - 5 - 1 - 6 - 1 - 1 - 1		444			·
8 - 9 - 10 - 10 - 1	L5 ppm	B 4[ 6]		Brown silty clay, stiff ▼ 7/31/86	, damp, pebbles, slight odor
-11	mqq C	C 설다			· · · · · · · · · · · · · · · · · · ·
-15		7Q.	4CL A	Brown silty clay, stiff	i, dry, no odoz
-18 - -19 - -20 - -21 - -22 - -23 -	O ppm	50 75 13[			
24 - 25 - 25 -	·				Page _ 1 _ of _ 1 _

£

čt No.: 90386A

£: 11-14-86

Elevation.

<b>-</b> /						
DEPTH IN FEET	SAMPLE NUMBER	LOG 8 SAMPLE	PENE RESIS / FT	DESCRIPTION	#3 : 2"ID-0.02	CARS
				Existing Ground Surface		न् <u>व</u> विकास
0 -			1	AC Pavement and Base		
<b>T</b> ' -	ļ.	777		Black Silty Clayey Fill- Dry - No Odor		2525555
2 -				Light Brown Silty Clay - Moist - No Odor		
4 - 5 -				Light Brown to Light Green Silty Clay - 5- Maist No Odor 5-		
6 -	6-1		26	Olive Silty Clay - Moist - No Odor		
8 <b>-</b> 8 <b>-</b> 9 -				Light Brown Gravelly Silty Clay - Moist - No Odor	Y	
- 10 - - 11 - - 12 - - 13 - - 14 -				Brown Gravelly Silty Clay, Less Gravel w/ Depth - Very Moist - No Odor		
- 15 - - 16 - - 17 - - 18 -				Bottom of Boring at 15 ft.	-	
- 19 - - 20 -				20	-	
- 21 -					-	
- 22 -	]		ŀ		-	
- 23 - - 24 -					-	
- 25	_			25	-	
					-	
- 26 - - 27 -					-	

Figure 4 - Test Boring Log No. B-3

- Monitoring Well No. MW-6

∮∕/No.: 90386A

Elevation.

<del></del>		<del></del>			T	
EPTH IN FEET	SAMPLE	LOG & SAMPLE	PENE. RESIS. / FT.	DESCRIPTION	#3 4"ID-0.0	SAND
	-			Existing Ground Surface	1 5	7
上。十				Concrete Stab and Base		33333
1 -	•			Black Silty Clayey Fill - Bry - No Odor		
3 -				Olive Silty Clay - Moist - No Odor -		
5 -			14	Light Green Silty Clay w/ Brown Mottling - Moist - Moderate HC Odor		
7 - 8 - 9 - - 10 -	4-1		·	Olive Silty Sandy Clay - Very Moist Slight to Moderate HC Odor		
- 11 - 12 - 13 - 14				Light Brown Silty Sandy Clay - Very Moist - No Odor		
- 15 17 18 19 20 21 22 23 24 25 26				Bottom of Boring at 15 ft.  20	-	
<u> </u>						

Figure 2 - Test Boring Log No. B-1
- Monitoring Well No. MW-4

t No.: 90386A

11-14-86

Elevation.

					WELL DESIGN
OEPTH IN FEET	SAMPLE	LOG 8 SAMPLE	PENE. RESIS. / FT	DESCRIPTION	#3 SAND 2"ID-0.02 SLOT
		 		Existing Ground Surface	
		33333		AC Pavement and Base	33333
<b>-</b> 1 -				Black Silty Clay Fill	
2 -				Brown Silty Loam - Dry - No Odor	
- 4 - - 5 -			50	Light Green Silty Clay w/ Some Sand - Moist - No Odor	5-
- 6 - 7	5-1			Same as Above Except More Moisture - No Odor - No Recovery From Sample	
- 8 - - 9 - - 10 -				Brown Silty Gravelly Clay - Moist - No Odor 1	o -
- 11 - - 12 - - 13 - - 14 -				Same as Above Except No Gravel	
- 15 - - 15 -				Bottom of Boring at 15 ft.	_
- 17 -	1				-
<b>-</b>  - 18 -	1				
<b>1</b> - 19 -	-				
_ 20 -	4				20-
<b>-</b> 21 -	-				-
22 -	1				-
23 -	4				-
24 -	4				-
_ 25 -	1				25-
- 26 -	1				-
27 -	li .				-
<b></b>					

Figure 3 - Test Boring Log No. B-2

- Monitoring Well No. MW-5