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June 26, 1990

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

Subject: Phase II Hydrogeologic Assessment Report

Shell Oil Company

3420 San Pablo Avenue, Oakland, California

Delta Project No. 40-88-666 WIC No. 204-5508-5306

Dear Mr. Byrne:

Enclosed is a copy of Delta Environmental Consultants, Inc. (Delta's), *Phase II Hydrogeologic Assessment Report* for your review. Based on the results of our findings, we propose two additional monitoring wells to define the extent of petroleum hydrocarbons in ground water. One well upgradient from MW-6 and the other to the southeast of MW-8. Delta is currently seeking encroachment permits to implement this work.

If you have any questions regarding this matter, please contact me at (916) 638-2085.

Sincerely,

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Hal Hansen

Hydrogeologist/Project Manager

Halkansen

HH:law Enclosure

cc/enc:

Ms. Lisa McCann, California Regional Water Quality Control Board,

San Francisco Bay Region

Ms. Diane Lundquist, Shell Oil Company



3420 SAN PABLO AVENUE OAKLAND, CALIFORNIA DELTA PROJECT NO. 40-88-666 WIC NO. 204-5508-5306

· :

Delta Environmental Consultants, Inc.

3420 SAN PABLO AVENUE OAKLAND, CALIFORNIA DELTA PROJECT NO. 40-88-666 WIC NO. 204-5508-5306

Prepared by:

Delta Environmental Consultants, Inc. 3330 Data Drive, Suite 100 Rancho Cordova, California 95670 (916) 638-2085

June 26, 1990

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1.0 INTRODUCTION

Delta Environmental Consultants, Inc. (Delta), has been authorized to conduct an investigation of soils and ground water beneath a Shell service station located at 3420 San Pablo Avenue in Oakland, Alameda County, California (Figure 1). The investigation was intended to further characterize the distribution of petroleum constituents in soils and ground water beneath the site. Work was conducted in accordance with proposals contained in Delta's July 31, 1989, letter report. The purpose of this report is to present the results of the recent hydrogeologic investigation at the site.

1.1 Scope of Work

The following work was completed during this phase of the hydrogeologic investigation:

- Five standard penetration hollow-stem auger soil borings were advanced to depths of 21.5 to 26.5 feet below grade.
- Soil samples were collected at 5-foot intervals.
- Soil samples were screened with a photoionization detector (PID) for total organic vapors.
- Based on soil screening results, selected soil samples were submitted for analysis of benzene, toluene, ethylbenzene, xylenes (BTEX), and total petroleum hydrocarbons (TPH) using U.S. Environmental Protection Agency (EPA) Methods 8015 and 8020 by a California-certified laboratory.
- Each soil boring was completed as a 4-inch-diameter monitoring well.
- The five newly installed monitoring wells were developed, and water samples were collected from each of the existing monitoring wells. Water samples were submitted for analysis of BTEX and TPH by a California-certified laboratory using EPA Methods 8015 and 8020.

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- Depth to water was measured in each existing well (MW-1 through MW-9).
- This report was prepared, summarizing investigative work at the site to date.

2.0 SITE DESCRIPTION

2.1 Area of Investigation

The site is located at 3420 San Pablo Avenue at the southeast corner of the intersection of San Pablo Avenue and 35th Street in Oakland, California (Figure 1). This area of Oakland is a mixed-use residential/commercial area. The neighborhood southeast of the intersection of San Pablo Avenue and the MacArthur Freeway consists mostly of residential buildings; a commercial district lies northwest of this intersection.

The ground elevation of the site is approximately 30 feet above mean sea level (MSL). The topography slopes gently to the west at the rate of about 0.008 foot per foot. The primary surface water bodies in the vicinity of the site are the San Francisco Bay, which is located about 6,000 feet due west of the site, the Oakland Inner Harbor located approximately 2.3 miles south of the site, and Lake Merritt, a tidal lake, located about 1.4 miles southeast of the site.

2.2 Site History

The site (Figure 2) has been owned by Shell Oil Company and has been operated by various lessees for the past 23 years. In January 1985, steel tanks and product lines were replaced with double-walled fiberglass tanks and double-walled, fiberglass product lines.

During the installation of an electronic gasoline dispenser at the site in December 1984, gasoline-saturated soil was discovered beneath the pump island area. At that time, all product lines were tested for tightness and the super unleaded and regular systems failed. A review of inventory records indicated a loss of approximately 2,500 gallons of super unleaded and 1,500 gallons of regular gasoline. Tanks and product lines were replaced as described above. No lost product was recovered.

Presently, there are two pump islands in operation at the site. According to Joe Montgomery, the station mechanic, there was a third pump island located at the south side of the site (see Figure 2 for location). Information provided to Delta did not indicate the date of removal of the third pump island.

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2.3 Well Inventory

In mid-December 1988, an inventory of existing domestic and municipal wells near the site was initiated at the California Department of Water Resources (DWR) by a Delta representative. According to DWR records, 32 wells have been identified within a 1-mile radius of the site. Table 1 presents pertinent information regarding the wells, and Figure 3 shows well locations.

The City of Oakland receives potable water from the East Bay Municipal Utility District which relies on surface water for potable supply.

2.4 Regional Geology and Hydrogeology

The site lies within the East Bay Plain ground water basin. The East Bay Plain basin covers an area of about 114 square miles in Western Alameda County. It extends from the city of Hayward on the south to Albany on the north. Unconsolidated deposits consisting of the older alluvium, "Merritt Sand", bay mud, interfluvial basin deposits, fluvial deposits, and younger alluvium comprise the ground water reservoir (Hickenbottom and Muir, 1988). Maximum aggregate thickness of these deposits is about 1,100 feet. The undivided bedrock units form the bottom and eastern boundaries of the basin.

Ground water is found in all the units that make up the East Bay Plain basin; however, the older alluvium is the only unit that contains appreciable quantities of ground water and is considered the principal water-bearing zone of the basin. Ground water is typically found within the older alluvium under confined conditions due to the presence of clay and other fine-grained material overlying more permeable sand and gravel units. The direction of ground water flow within the basin is toward the San Francisco Bay. The elevation of the potentiometric surface within the basin ranged from about 30 to -20 feet MSL.

3.0 SUMMARY OF PREVIOUS WORK

3.1 Soil Sample Analytical Results

Soil samples have been collected during two previous episodes of drilling and monitoring well installation. On August 8, 1988, Ensco Environmental Services, Inc. (Ensco), drilled soil borings B-1 through B-5 at the site. On April 10 and 11, 1989, Delta drilled soil borings MW-1 through MW-4 and completed each boring as a monitoring well. Soil samples collected in each of these borings were submitted for laboratory analysis of TPH and BTEX by EPA-approved methods. The analytical results are summarized in Table 2. The results of these analyses indicated that petroleum constituents are present in soils around the northwest end of the tank cluster and in soils in the vicinity of monitoring well MW-2.

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TABLE 1 Domestic Well Inventory

Property Owner	Well Location ^a	Year Drilled	Well Use
PG&E	1S,4W-23D	1973	Industrial
PG&E	1S-4W-23F	1974	Industrial
ARCO	1\$-4W,23K	1988	Monitoring
Sherwin Williams Co.	1S-4W,22C	1925	Industrial
Presto-Lite Co.	1S-4W,22	1908	Industrial
AC Transit	1S-4W,22A	1987	Industrial
City of Emeryville	1S-4W,22B	1987	Municipal
Del Monte Corp.	1S-4W,22H	1986	Monitoring
PG&E	1S-4W,22Q	1975	Industrial
Yosemite Laundry Co.	1S-4W,23A	Unknown	Industrial
Toscani Bakery	1S-4W,23E	1928	Industrial
American Creamery Co.	1S-4W,23	Unknown	Industrial
California Linen Supply Co.	1S-4W,23	1926	Industrial
City of Paris Laundry	1S-4W,23M	1927	Industrial
ARCO	1S-4W,23M	1986	Monitoring
Providence Hospital	1S-4W,26A	Unknown	Municipal
PG&E	1S-4W,26B	1974	Industrial
Oakland School District	1S-4W,26C	Unknown	Municipal
Providence Hospital	1S-4W,26G	Unknown	Municipal
Chevron Corp.	1S-4W,26	1984	Monitoring
Anheiser-Busch Co.	1S-4W,27C	1987	Monitoring
Joseph Kelly	1S-4W,27	Unknown	Domestic
John Moore	1S-4W,27	Unknown	Domestic
PG&E	1S-4W,27F	1974	Industrial
City of Oakland	1S-4W,27K	1927	Municipal
PG&E	1S-4W,24D	1976	Industrial
Chevron Corp.	1S-4W,24N	1988	Monitoring
August Santos	1S-4W,14L	1977	Domestic
PG&E	1S-4W,P	1974	Industrial
Shell Development Corp.	1S-4W,15Q	1934	Industrial
Cetus Corp.	1S-4W,15Q	1986	Industrial
East Bay D.M.V.	1S-4W,15Q	1987	Monitoring

^aLocations given as Township, Range, Section, (Mount Diablo Base and Meridian) and Section subdivision. The section subdivisions are based on the standard USGS well numbering system wherein each 1/4, 1/4 section (40-acre parcel) is assigned a letter from A to R.

TABLE 2 Soil Chemical Analysis Concentrations in parts per million (ppm)

Sample <u>Number</u>	Sample <u>Depth (ft)</u>	Date <u>Sampled</u>	<u>Benzene</u>	<u>Toluene</u>	Ethyl- <u>benzene</u>	<u>Xylenes</u>	EDB ^a	EDC ^b	<u>TPH^c</u>	Total <u>Lead</u>
B-1-1 ^d	5-5.5	08/08/88	1.90	42.00	43.00	120.00	NAd	NA	1,400.00	NA
B-1-2 ^d	9.5-10	08/08/88	NA	NA	NA	NA	NA	NA	80.00	NA
B-1-3 ^d	15-15.5	08/08/88	NA	NA	NA	NA	NA	NA	<5.0	NA
B-1-4 ^d	20-20.5	08/08/88	NA	NA	NA	NA	NA	NA	<5.0	NA
B-2-1 ^d	5-5.5	08/08/88	1.50	16.00	35.00	33.00	NA	NA	550.0	NA
B-2-2 ^d	10-10.5	08/08/88	0.70	3.30	7.80	48.00	NA	NA	580.00	NA
B-3-1-2-3 ^d (composite)	5, 10 and 15	08/08/88	NA	NA	NA	NA	NA	NA	<5.0	NA
B-4-1-2-3 ^d (composite)	5, 10 and 15	08/08/88	NA	NA	NA	NA	NA	NA	<5.0	NA
B-5-1-2-3 ^d (composite)	5, 10 and 15	08/08/88	NA	NA	NA	NA	NA	NA	<5.0	NA

NOTES:

^aEthylene dibromide.

^b1,2-dichloroethane.

^cTotal petroleum hydrocarbons as gasoline.

^dSoil samples collected by Ensco Environmental Services, Inc.

^eNot analyzed.

^fNot detected.

^gSoil samples collected by Delta Environmental Consultants, Inc.

TABLE 2-Continued

Soil Chemical Analysis Concentrations in parts per million (ppm)

Sample <u>Number</u>	Sample <u>Depth (ft)</u>	Date <u>Sampled</u>	<u>Benzene</u>	<u>Toluene</u>	Ethyl- <u>benzene</u>	Xylenes	EDB ^a	EDC ^b	<u>TPH</u> c	Total <u>Lead</u>
MW-1-1 ⁹	5.5-6	04/11/89	1.2	14	19	100	<0.2	<0.2	850	4
MW-1-2 ^g	10.5-11	04/11/89	<0.05	1.9	1.9	16	<0.5	<0.5	80	3
MW-2-2 ^g	10.5-11	04/10/89	0.4	1.5	1.7	15	<0.2	<0.2	70	8
MW-3-2 ^g	10.5-11	04/10/89	<0.002	0.010	0.008	0.069	<0.002	<0.002	<0.2	3
MW-4-2 ^g	10.5-11	04/10/89	<0.002	0.005	0.004	0.031	<0.002	<0.002	<0.2	2
MW-5-1 ^g	5.5-6	01/19/90	ND^f	ND	ND	ND	NA	NA	5.0	NA
MW-6-1 ⁹	5.5-6	01/19/90	ND	ND	ND	ND	. NA	NA	ND	NA
MW-7-1 ⁹	5.5-6	01/19/90	0.078	ND	0.21	ND	NA	NA	14	NA
MW-8-1 ⁹	5.5-6	01/18/90	ND	ND	ND	ND	NA	NA	ND	NA
MW-9-2 ^g	10.5-11	01/18/90	ND	ND	0.39	0.14	NA	NA	6.1	NA

NOTES:

aEthylene dibromide.
b1,2-dichloroethane.
cTotal petroleum hydrocarbons as gasoline.
dSoil samples collected by Ensco Environmental Services, Inc.
eNot analyzed.
fNot detected.
gSoil samples collected by Ensco Environmental Services, Inc.

⁹Soil samples collected by Delta Environmental Consultants, Inc.

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3.2 Ground Water Sample Analytical Results

Ground water samples were collected from each existing well (MW-1 through MW-4) on April 17, 1989. Samples were analyzed for TPH and BTEX using EPA Method 524.2. Concentrations ranged from 35 ppm TPH and 12 ppm benzene in MW-2, to <0.05 ppm TPH and 0.0012 ppm benzene in MW-4 (Table 3).

TABLE 3

Ground Water Chemical Analysis

Concentrations in parts per billion (ppb)

Monitoring Well	Date <u>Sampled</u>	Benzene	Toluene	Ethyl- <u>benzene</u>	Xylenes	EDB ^a	EDC	b TPHc
MW-1	04/17/89 01/23/90	1,400 NA ^e	2,300 NA	6,600 NA	1,100 NA	ND ^d NA	10.0 NA	12,000 NA
MW-2	04/17/89 01/23/90	12,000 110	1,800 9.6	12,000 140	2,200 3,300	<100 NA		35,000 40,000
M₩- 3	04/17/89 01/23/90	3.0 1.1	2.0 <0.3	9.0 <0.3	1.0 <0.3	<1.0 NA	<1.0 NA	100 140
MW-4	04/17/89 01/23/90	1:2 1.2	<1.0 <0.3	3.0 <0.3	<1.0 <0.3	<0.1 NA	1.5 NA	500 150
MW-5	01/23/90	4.8	<0.3	<0.3	<0.3	NA	NA	290
MW-6	01/23/90	460	100	9.3	1,600	NA	NA	33,000
MW-7	01/23/90	61	1.3	<0.3	1,600	NA	NA	3,200
MW-8	01/23/90	160	730	47.0	3,300	NA	NA	22,000
MW-9	01/23/90	<0.3	0.3	0.97	3.0	NA	NA	8.8

^aEthylene dibromide.

^b1,2-dichloroethene.

Total petroleum hydrocarbons.

dNot detected.

^eNot analyzed.

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4.0 CURRENT PROJECT RESULTS

4.1 Site Soils and Geology

Five additional soil borings (MW-5 through MW-9) were drilled at the site on January 18 and 19, 1990. The soil boring for monitoring well MW-5 was advanced to a depth of 26.5 feet below grade, while borings for MW-6 through MW-9 were advanced to a depth of 21.5 feet below ground surface. Soil boring locations are illustrated in Figure 2. The soil boring logs are presented in Appendix A.

Soils encountered beneath the site during this drilling event consisted of silty clay, sandy clay, and gravelly sand. The contact between the silty clay and the sandy clay was gradational. The contact between the sandy clay and gravelly sand was sharp.

Two geologic cross-sections have been prepared to illustrate inferred subsurface relationships. A cross-section location map is presented in Figure 4. Cross-sections of the site are presented in Figures 5 and 6.

4.2 Monitoring Well Installation

Soil borings MW-5 through MW-9 were completed as monitoring wells. Each well was constructed using 4-inch inside-diameter Schedule 40 PVC blank casing and 4-inch inside-diameter Schedule 40 PVC well screen with 0.010-inch well slot. Monitoring well construction details are provided in Appendix B. Monitoring well locations are shown in Figure 2.

Following placement of the well casing and screen, a sand filter pack, extending from the bottom of the well to about 1 foot above the top of the screen, was placed in the annular space between the well screen and the borehole. A 1-foot-thick bentonite seal was placed above the filter pack using bentonite pellets. The annular space above the bentonite was filled with a cement-bentonite grout which extended to the ground surface. Each well was fitted with a lockable, waterproof cap and a watertight, protective-steel well cover.

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4.3 Site Hydrogeology

Ground water levels were measured in each of the monitoring wells (MW-1 through MW-9) on February 21, 1990. Water level data are summarized in Table 4. As shown in Table 4, ground water elevations ranged from 12.41 feet MSL in monitoring well MW-4 to 15.37 MSL in monitoring well MW-6. The direction of ground water flow determined from these data appears to be predominantly toward the southwest.

An anomalously low water level was recorded in monitoring well MW-9. Figure 7 illustrates the ground water flow direction beneath the site using the data from monitoring well MW-9, which indicate a northerly flow direction in the vicinity of this well. Figure 8 illustrates the consistently southwesterly flow direction inferred if data from monitoring well MW-9 are excluded. The ground water gradient determined for this site is approximately 0.02 foot/foot.

4.4 Soil Chemistry

Soil samples were collected at 5-foot-depth intervals in monitoring wells MW-5 through MW-9, and screened with a PID for total organic vapors. PID readings are recorded on the soil boring logs presented in Appendix A. Soil samples were selected for laboratory analysis based on PID readings and field observations. Selected soil samples were analyzed for TPH and BTEX by EPA Methods 8015 and 8020. The results of these analyses are summarized in Table 2. The certified analytical data sheets are included in Appendix C. Benzene was detected (at a concentration of 0.078 ppm) only in the soil sample collected from approximately 6 feet below grade in soil boring MW-7. TPH concentrations detected in these samples ranged from below the detection limit in samples collected from soil borings MW-6 and MW-8 to 14 ppm in a soil sample from boring MW-7.

4.5 Ground Water Chemistry

Ground water samples were collected in eight of the nine monitoring wells on January 23, 1990. Monitoring well MW-1 was not sampled because it contained approximately 0.01 foot of free product. Appendix D contains the field sampling records. Ground water samples were submitted for analysis of TPH and BTEX by EPA Methods 8015 and 8020. The analytical results are summarized in Table 3, and certified laboratory reports are included in Appendix E.

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TABLE 4 **Ground Water Elevations**

Monitoring Well	<u>Date</u>	Top of Riser Elevation (ft)	Water Depth (feet)	Ground Water Elevation (ft)	Physical Observations
MW-1	06/12/89	21.28	9.57	11.71	200
***** *	01/23/90	***************************************	9.04	12.24	Odor
	02/02/90		8.89	12.39	Odor
	02/21/90		8.00	13.28	Strong odor
MW-2	06/12/89	21.56	7.96	13.60	!
	01/23/90		8.30	13.26	No odor
	02/02/90		8.04	13.52	Odor
	02/21/90		7.57	13.99	No odor
MW-3	06/12/89	21.78	10.77	11.01	
	01/23/90		9.26	12.52	No odor
	02/02/90		9.33	12.45	No odor
	02/21/90		8.24	13.54	No odor
MW-4	06/12/89	20.31	11.19	9.12	Marine
	01/23/90		9.25	11.06	No odor
	02/02/90		8.04	12.27	No odor
	02/21/90		7.90	12.41	all mp this
MW-5	01/23/90	20.91	7.89	13.02	Slight odor
	02/02/90		8.23	12.68	No odor
	02/21/90		7.31	13.60	Slight odor
MW-6	01/23/90	22.32	7.57	14.75	No odor
	02/02/90		7.86	14.46	No odor
	02/21/90		6.95	15.37	No odor
MW-7	01/23/90	20.36	6.98	13.38	No odor
	02/02/90		8.91	11.45	Odor
	02/21/90		6.65	13.71	No odor
MW-8	01/23/90	20.95	7.19	13.76	Slight odor
	02/02/90		7.32	13.36	No odor
	02/21/90		6.90	14.05	Very slight odor
MW-9	01/23/90	21.19	9.31	11.88	No odor
	02/02/90		9.02	12.17	No odor
	02/21/90		8.28	12.91	No odor

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The TPH concentrations detected in ground water samples ranged from 8.8 parts per billion (ppb) in

monitoring well MW-9 to 40,000 ppb in monitoring well MW-2. Benzene concentrations ranged from

below detection limits in monitoring well MW-9 to 460 ppb in monitoring well MW-6. Isoconcentration

maps of benzene and TPH constituents are presented in Figures 9 and 10.

5.0 DISCUSSION

Soils beneath the site consist of silty clay, sandy clay, and gravelly sand. Contact between the silty clay

and sandy clay is gradational. Contact with the sandy clay and gravelly sand is sharp.

Depth to ground water is approximately 7.5 feet. The predominant direction of ground water flow beneath

the site is to the southwest at a gradient of 0.02-foot/foot.

In Delta's previous letter report dated July 31, 1989, ground water elevations were interpreted as two

distinct hydrologic zones. After examining the data collected from the five additional monitoring wells

drilled on January 18 and 19, 1990, Delta believes that ground water elevations represent the water table

surface in a single hydrologic unit.

An anomalously low water level was measured in MW-9. At this time, the reason for this anomalously

low water level is unknown.

Petroleum hydrocarbons in soils with concentrations greater than 100 ppm appear to be limited to the soil

surrounding the tank cluster.

MW-1 contains approximately 0.01-foot of free product. Dissolved concentrations of petroleum

hydrocarbon constituents range from a high of 460 ppb benzene and 33,000 ppb TPH in MW-6 to a low

of <0.3 ppb benzene and 8.8 ppb TPH in MW-9.

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6.0 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.

This report has been prepared solely for the use of Shell and any reliance on this report by third parties shall be as such party's sole risk.

DELTA ENVIRONMENTAL CONSULTANTS, INC.

This report was prepared by:

Hal Hansen

Hydrogeologist/Project Manager

Date 6-22-90

This report was reviewed by:

Erin Dougherty Geologist Date 6-22-90

The work performed in this report was done under the supervision of a California Registered Geologist:

Dale A. van Dam, R.G. California Registered

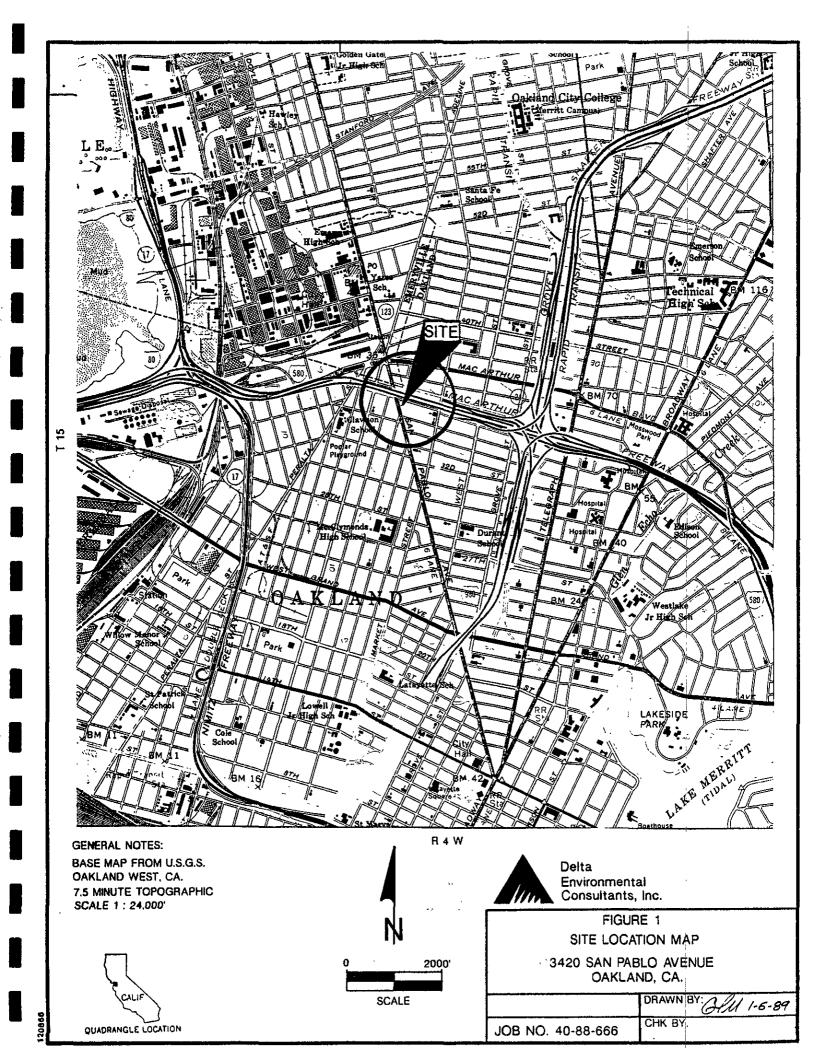
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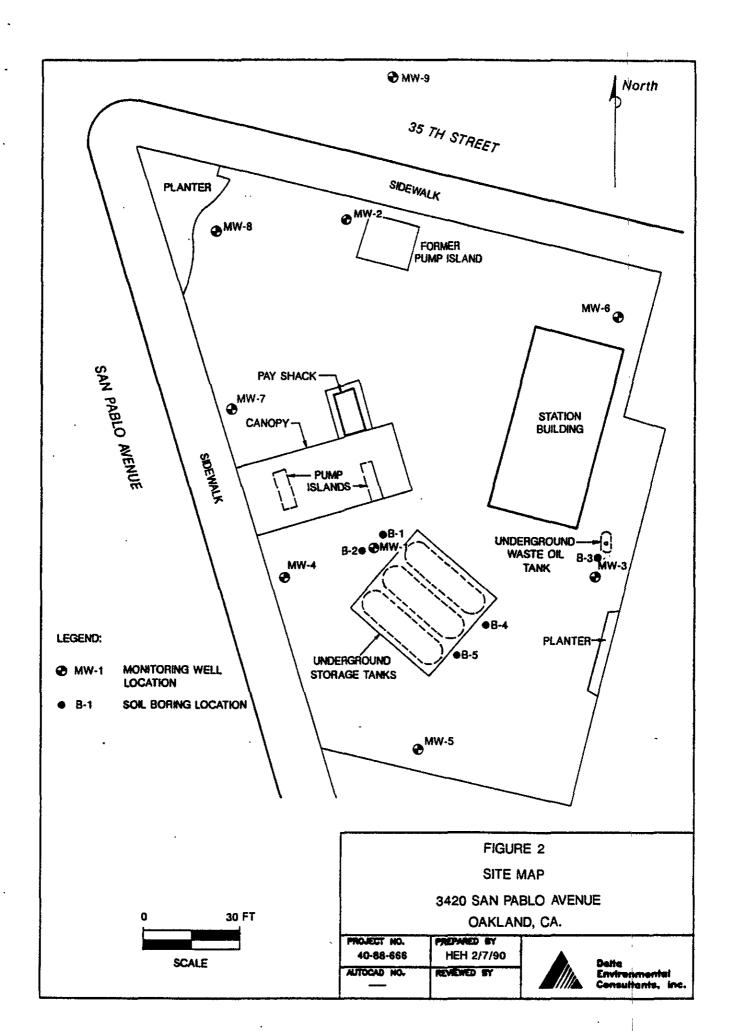
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APPOXIMATE WELL LOCATIONS

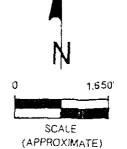
Domestic Well Inventory

Well Property Owner	Well Use
1. PGLE	Industrial
2. PGAE	industrial
3. AFCO	Monitoring
4. Sherwin Williams Co.	Industrial
5. Presto-Lite Co.	Industrial
6. AC Transit	[ndustria]
7. City of Emeryville	Municipal
8. Del Monte Corp.	Monitoring
9. PG4E	Industrial
10. Yosemite Laundry Co.	Industrial
11. Toscani Bakery	Industrial
12. American Creamery Co.	Industrial
13. California Linen Supply Co.	Industrial
14. City of Paris Laundry	Industrial
15. Arco	Monitoring
16. Providence Hospital	Municipal
17. PG&E	Industrial
18. Oakland School District	Municipal
19. Providence Hospital	Municipal
20. Chevron Corp.	Monitoring
21. Anheuser-Busch Co.	Monitoring
22. Joseph Kelly	Domestic
23. John Moore	Domestic
24. PG&E	Industrial
25. City of Oakland	Municipal
26. PGZE	Industrial
27. Chevron	Honitoring
28. August Santos	Domestic
29. PG&E	Industrial
30. Shell Development Corp.	Industrial
31. Cetus Corp.	Industrial
32. East Bay D.M.V.	Monitoring

GENERAL NOTES

BASE MAP FROM U.S.G.S. OAKLAND WEST, CA. 7.5 MINUTE TOPOGRAPHIC SCALE 1, 24.000'







Delta Environmental Consultants, Inc.

FIGURE 3

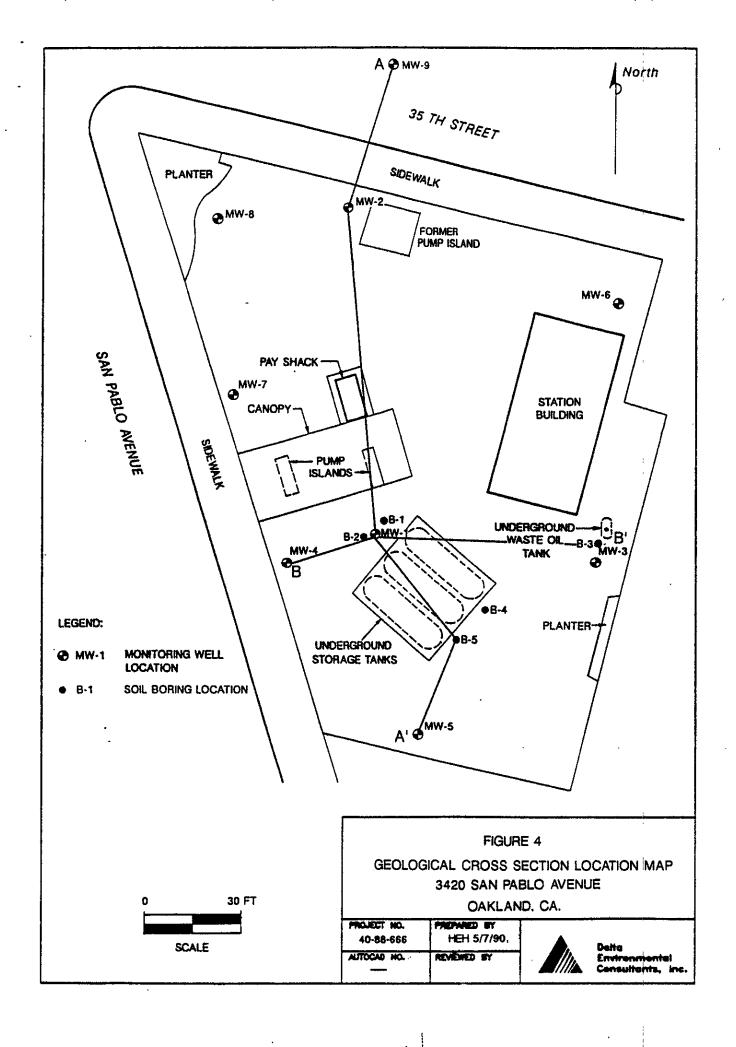
DOMESTIC WELL LOCATION MAP

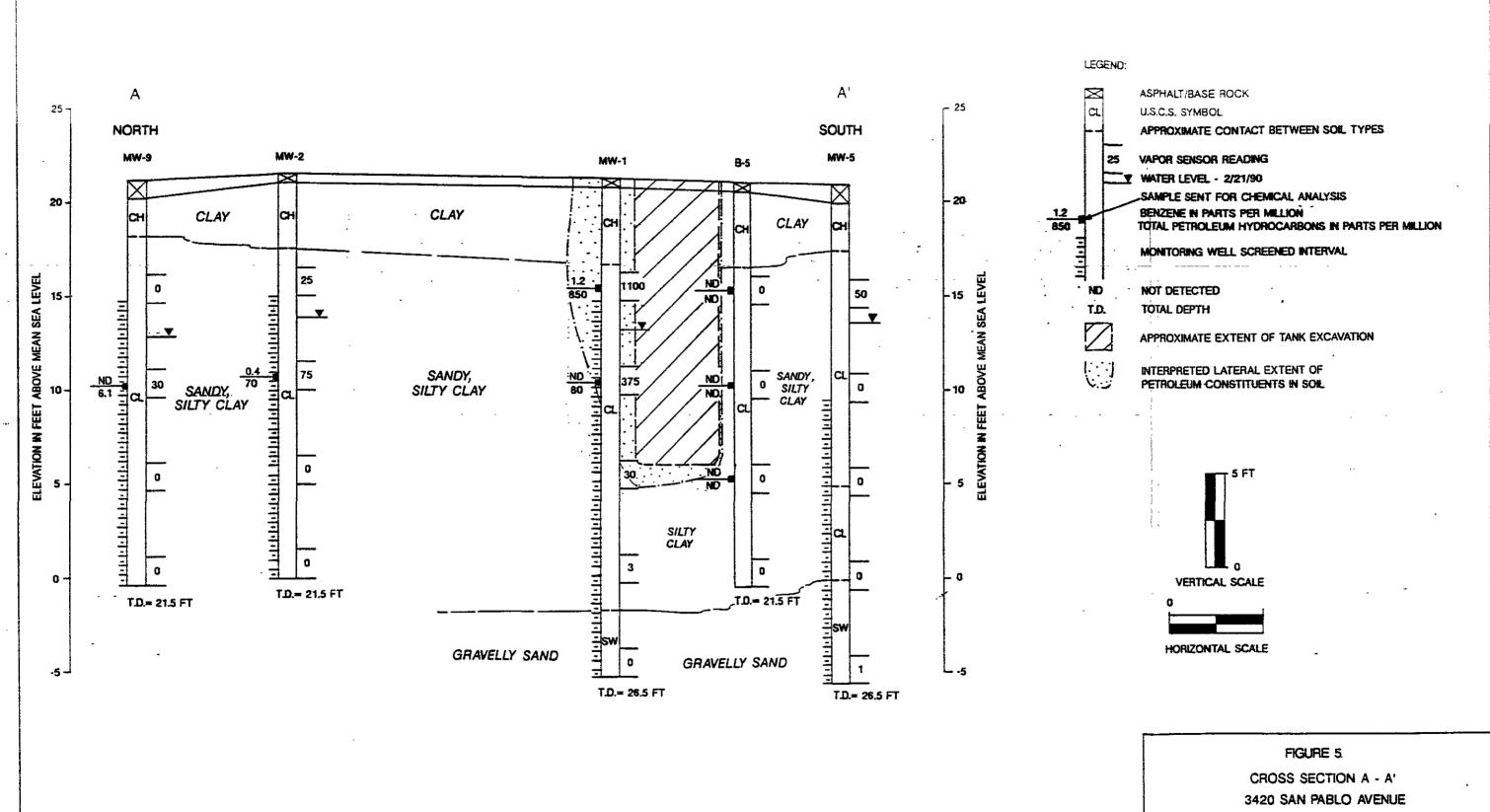
3420 SAN PABLO AVENUE

OAKLAND, CA.

DRAWN BY GPM 1-6-89

JOB NO 40-88-666

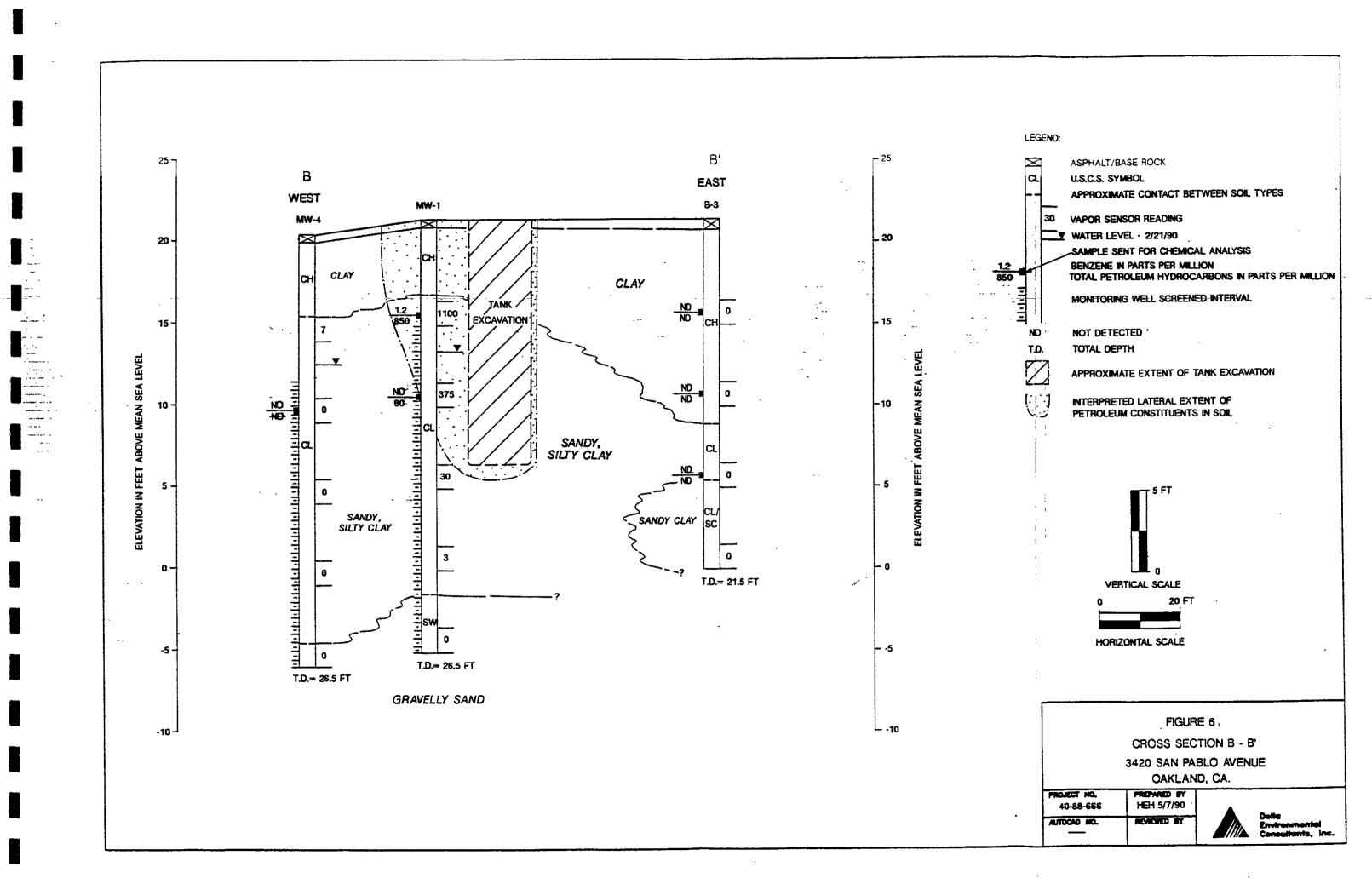


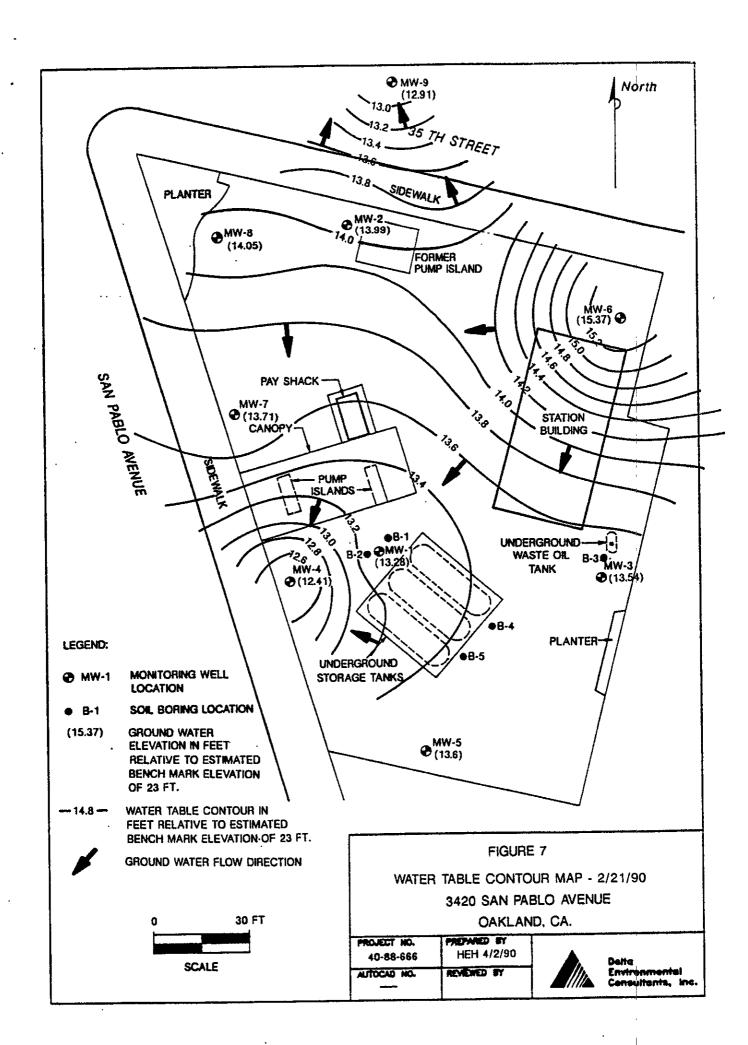


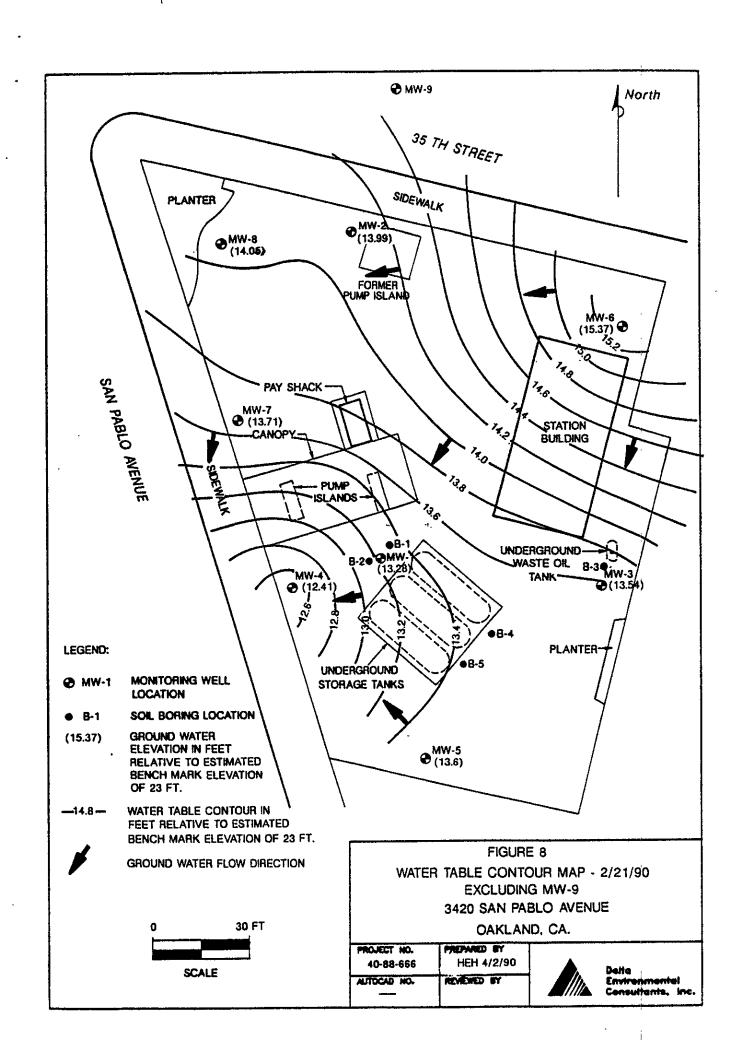
OAKLAND, CA.

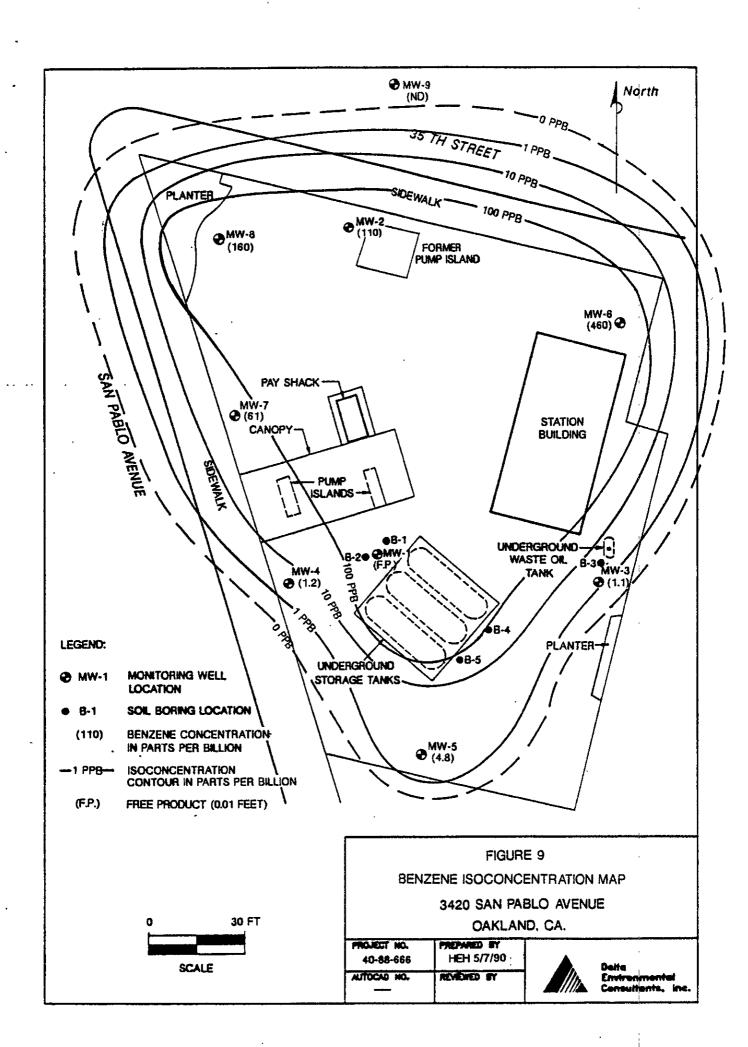
PROJECT NO.	PREPARED BY
40-88-666	HEH 5/7/90
AUTOCAD NO.	REVIEWED BY
	ľ

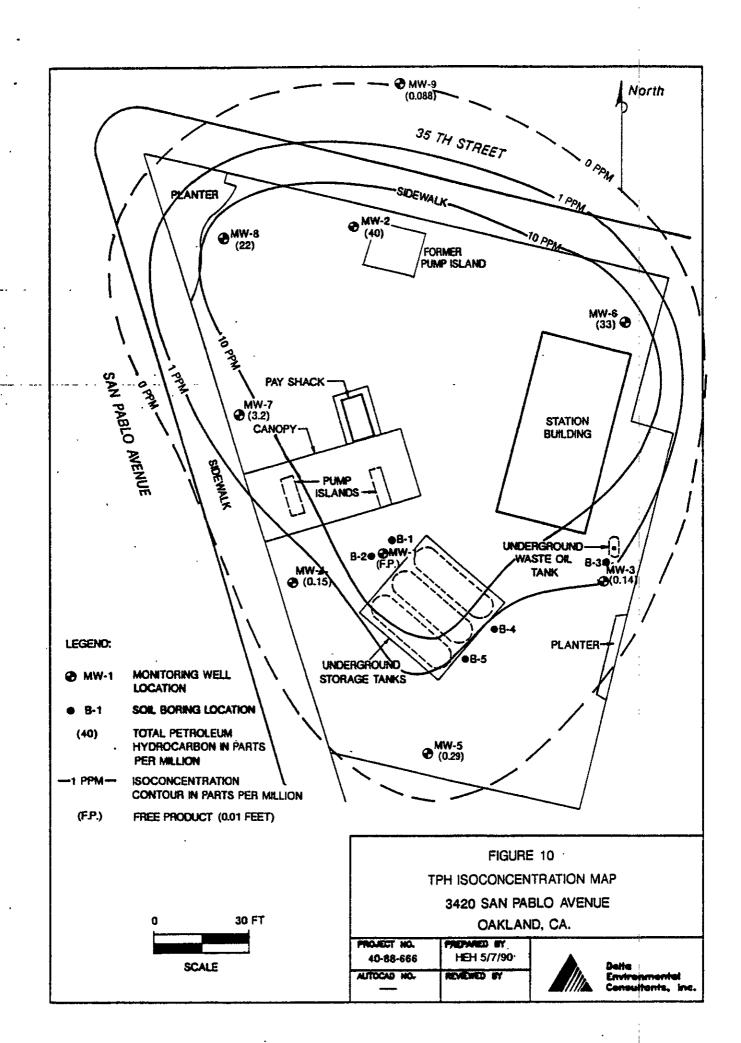












APPENDIX A

Soil Boring Logs

PR	OJEC	T NAM	E / LO	CATION		PROJECT NUMBER: 40-88-66	BORING 6 NUMBER: M	W-5	SHEET	1 OF 2
3.	420	nd Sh San P nd, C	ablo A	venue		COMTRACTOR: West Hazmat Dri		DRILLI	NG D: H	.S.A.
						DRILLER: Randy Reidhead	· · · · · · · · · · · · · · · · · · ·	DRILLI RIG:		ME-75
						START: 12:15/01-	19-90	COMPLE	TED:	2:40/01-19-90
LA	ND NER:	Shel	1 0il	Company	7	SURFACE ELEVATION: 20.91		LOGGEI Hal H	BY: Jansen	
SAMPLE	SAMPLE MPLER	SOPZES	SI ANT PL (ft)	SR AEC POV L(in)	DEPIH SCALE 1"= 4'	DESCRIPTIONS OF MAIN CONDITION		CONTAM OBSERV INSTRU OVM UNITS:	MENT:	GENERAL OBSERVATION NOTES
		-	1(10)	2(21.)		sphalt road base		014110.	Pran	
					2	IAY; very dark gra lastic, slightly i	ay, highly moist			
CA.	MW- 5- 1	9/ 12/ 38	5.0 - 6.5	18	4 — S 5 — S 6 — m	ANDY CLAY; yellow oderately plastic oist (CL)	ish brown, — , slightly	50		Slight odor
CA.	M₩ 5- 2	12/ 16/ 9	10.0- 11.5	18	7 — 8 — 9 — 10 — 11 — 12 — 13 — 13 — 13 — 15	Saturated	- - - - - - - - -	0		No odor
CA.	MW- 5⊶ 3	5/ 11	15.0- 16.5	18	14 ————————————————————————————————————	SILTY CLAY; dark y brown, moderately saturated (CL)	yellowish -	o		No odor
CA	MW 5- 4	4/4/7	20.0- 21.5	18	18 ————————————————————————————————————		-	0		No odor
	£.72.7	men v	OUTET Y	NG73	<u> </u>	m	-			***************************************
		,	EVEL D	ATA	GEOLOGIS					
DAT		02-0			Halb	lansen				ī
TIN		2:40			SIGNATURE					
GWI CAS	SING	7.89	9	_	- Hal Hanse	n				
DE	TH	25	'		TYPED NAM	E				

•

PR	OJEC	T NAM	E / LC	CATTON		PROJECT	BORING	SHE	ET 2 OF 2		
•			-			NUMBER: 40-88-666	NUMBER: M	W −5	2 01 2		
3	420	nd Sh San F nd, C	ablo A	venue		CONTRACTOR: West Hazmat Drilling		DRILLING H.S.A.			
		,				DRILLER: Randy Reidhead	DRILLER: Randy Reidhead		DRILLING RIG: CME-75		
						START: 12:15/01-19	-9 0	COMPLETED	2:40/01-19- 9		
	NER:		l Oil	Company	Y	SURFACE ELEVATION: 20.91		LOGGED BY Hal Hans	en		
S T A Y	S N A U	BLOW BLOW	S I A N M T	SAECOVII)				CONTAMINA OBSERVATI			
SAMPLE	M M P B	W W	MT	M C P O	DEPIH	DESCRIPTIONS OF MAT AND CONDITIONS	ERTALS	INSTRUMEN	— OBSERVATION		
E	ER	S	E(ft)	E(in)	SCALE 1"= 4'			OVM UNITS: pp	m ′		
CA	MW-	26/ 47/	25.0- 26.5	12	25 — 0	RAVELLY SAND; brown	, course —	1	No odor		
	5- 5	50	26.5		26 — 1	RAVELLY SAND; brown sand, saturated, min plastic fines (SW)	or -				
		for 4"			27 - 7	Notal Depth at 26.5	feet –				
					28 —						
					29 —						
					30 📙						
					31						
					32 +				; ,		
					33 +				<u> </u> 		
					35		-	:	,		
					36 +						
I	l				37 —		_				
					38						
					39 —		-				
					40 —						
					41 —				I		
					42 —				!		
					43 —		-				
					44 —		-				
İ					45 +		_				
				Ì	46		-				
					<u> </u>						
			EVEL D	ATA	GEOLOGIS	T					
DAT		02-0			- ghall	Lansen			•		
TIM		2:40			SIGNATURE						
GWI	ING	7.89	7	-	Hal Hanse	n					
DEE	TH.	25	<u> </u>		TYPED NAM	E					

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	0.7730	M 1731	m / To	CATITON.		PROTECTI	BORING		SHEET	1 OF	1 1
		nd Sh	•	CATION		PROJECT NUMBER: 40-88-6	666 NUMBER: 1	W-6	SULET.	ı, Or	' 1
3	420	San F	ablo A	venue		CONTRACTOR: West Hazmat Drilling		DRILLING METHOD: H.S.A.			
						DRILLER: Randy Reidhead	DRILLER: Randy Reidhead		DRILLING RIG: CME-75		
						START: 9:00/01-	19-90	COMPI	ETED: 1	:00/01	-19-90
IA OW	ND NER:	Shel	1 Oil	Company	7	SURFACE ELEVATION: 22.3	2		D BY: Hansen		
STAV	SN	B C	S I A N M T	SRAE					CONTAMINANI OBSERVATION GENERAL		
SAMPE MPLE	M M P B L E	COUNTS	MT P L E(ft)	SR AEC PC L(in)	DEPIH SCALE 1"= 4'	DESCRIPTIONS OF AND CONDITI	MATERIALS ONS	INSTR	INSTRUMENT: OE		ATION ES
			2(20)	-(,		Asphalt road bas	e	-	V PP		
					1 +	CIAY; very dark	gray,	1			
					3 -	CIAY; very dark highly plastic, moist (CH)	singuity —	1			
					3 T]			
CA	MW	10/	5.0-	18	5	SANDY CLAY: gree	mish orav. <i>-</i>	3		No odo	r
<u> </u>	MW 6- 1	10/ 12/ 38	6.5		6 +	SANDY CIAY; gree moderately plast moist (CL)	ic, slightly]			-
					7 +	,	-	1	ł		
					8 井			7			
					9 🕂		_	1	1		
CA	MW- 6-	9/ 13/ 20	10.0- 11.5	18	10 📘	Color change to brown	yellowish —	14	1	Slight	odor
,	ž	20	12.0		11 —	DIOMI		1			
!					12 🕂		***************************************	1			
					13	Saturated	-	1			
					14 ———			1_			
CA	₩- 6- 3	5/ 8/ 11	15.0- 16.5	18	15 +	SILTY CLAY; yell moderately plast saturated (CL)	owish brown, ic,	‡°	[1	No odo	r
	3	TT			16 —	saturated (CL)		1			
					18 —						
					19		-				
CA	MW	4/	20.0-	18	20			0	1	No odo	r
	MW- 6- 4	4/ 11	20.0- 21.5		21 +	Total Depth at	21.5 feet _	1			 -
					22		-	-			
			1		23 井		_	1			
	WATER LEVEL DATA GEOLOGI				† GEOLOGIS	⊋n	· · · · · · · · · · · · · · · · · · ·	1			
יגנרו											
	TIME 11:41		- Wal	Wansen							
	GWL 7.86		SIGNATUR	į							
CA	CASING CASING		— Hal Hanse								
DEPTH		20	<u>' </u>		TYPED NAI	ME			;		

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PR	OJEC	T NAM	E / LO	CATION		PROJECT NUMBER: 40-88-66	BORING 56 NUMBER: M	SHEET	1 OF 1		
34	420	nd Sh San P nd, C	ablo A	venue		CONTRACTOR: DRILLING		H.S.A.			
		·				DRILLER: Randy Reidhead		DRILLING RIG:	DRILLING		
						START: 11:00/01-	-1990	COMPLETED: 1	2:00/01-19-90		
LAI	VD VER:	Shel	1 0 i 1	Company	7	SURFACE ELEVATION: 20.30	5	LOGGED BY: Hal Hansen			
STAYPE	SNAU	B C	S I A N M T	SAE MCO PO	DEPIH	DESCRIPTIONS OF I	MATTETTAT S	CONTAMINANT OBSERVATION			
TYPE SAMPLE	SAMPLE BANPLE	CODZES	p L E(ft)	PO LV E(in)	SCALE 1"= 4'	AND CONDITIO	ONS	INSTRUMENT: OVM UNITS: ppm	NOTES		
					1	Asphalt road base					
					2 + 0	IAY; very dark gr plastic, slightly	ray, highly moist —				
					3 + 7	(CH)	•				
					4 +			1			
CA	MW- 7-	16/ 22/ 30	5.0~ 6.5	18	5 + S	SANDY CLAY; green moderately plastic	ish gray, —	95	Moderate odor		
	1	30			6 — n	noist (CL)	***************************************]			
					8 —]	1		
					9 +				1		
CA	MW- 7-	9/ 15/ 25	10.0- 11.5	18	10 + 6	Color change to ye	ellowish —	85	Moderate odor		
	2	25			11 + s	Saturated	-				
					12 —		•	1			
					13 —						
CA	3457	6/	15 0-	18	14 —		<u></u>	5	Slight odor		
CA.	MW- 7- 3	6/ 8/ 10	15.0- 16.5	10		STITY CIAY: vello	vish brown.		biigite odei		
		20			17 + 17	SILTY CIAY; yellow moderately plastic (CL)	c, saturated				
					18 —	•			-		
					19 +		,	1			
CA	MM-	6/	20.0- 21.5	18	20 +			0	No odor		
	7- 4	6/ 8/ 14	21.5		21 —		_]	п		
					22 — 1	Notal Depth at 21.	.5 feet	1			
					23 —						
	WA'	TER L	EVEL D	ATA	GEOLOGIS	sr		I	<u> </u>		
DA	TE	02-	02		91.10	Yansen					
TII	ME	11:	52		SIGNATURE	•					
GW.	GWL 8.91		1		Hal Hanse						
CA! DE	SING PIH	20	,		TYPED NAM						

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PR	OJEC	T NAM	Œ / LC	CATION		PROJECT NUMBER: 40-88-66	BORING 66 NUMBER: N	W-8 SHEET	1 OF 1
1 3	420	nd Sh San I	ablo A	venue		CONTRACTOR: West Hazmat Dri		DRILLING METHOD:	H.S.A.
	акта	nd, C	A			DRILLER: Randy Reidhead		DRILLING RIG: CME-75	
ļ					j	START: 2:30/01-1	18-90	COMPLETED:	3:45/01-18-90
L	NER:		1 0i1	Company	7	SURFACE ELEVATION: 20.95	5	LOGGED BY: Hal Hansen	Ų.
SAYPE MPL E	S N M M P E	BLOW BLOW	S I M T P L	SAECOVII)	SCALE	DESCRIPTIONS OF M AND CONDITIO	MATERIALS DNS	CONTAMINANT OBSERVATION INSTRUMENT:	GENERAL OBSERVATION
E	ER	S	E(ft)	E(in)	1"= 4'	sphalt road base		UNITS: ppm	
CA	MW-	16/	5.0-	18	1 — C 2 — D	IAY; very dark gr lastic, slightly CH)	ay, highly moist —	3	Slight odor
	8	16/ 27/ 28	5.0- 6.5		6 + Si	ANDY CLAY; greeni oderately plastic oist (CL)	sh gray, ;, slightly	J	STIGHT COOL
CA	MW- 8- 2	11/ 13/ 19	10.0- 11.5	18	10 — Si 11 — Si 12 — 13 — 14 — 14	aturated		100	Moderate odor
CA	MW- 8- 3	4/6/	15.0- 16.5	18	15 ————————————————————————————————————	HITY CLAY; dark y rown, slightly pl aturated (CL)	ellowish —	0	No odor
CA	MW- 8- 4	9/ 11/ 16	20.0- 21.5	18	19 ————————————————————————————————————	otal Depth at 21		0	No odor
L	WATER LEVEL DATA GEOLOGIST				GEOLOGIST				
DAT		02-0		<u> </u>				۰	į
TIM		11:4				Larsen			1
GWI		7.3		 	SIGNATURE				
	ING TH	20			Hal Hansen				

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						T	T =		_		
,PR	OJEC	T NAM	E / LC	CATION		PROJECT NUMBER: 40-88-6	66 BORING NUMBER: N	IW-9 SHEET	1 OF 1		
3	420	nd Sh San P nd, C	ablo A	venue		CONTRACTOR: West Hazmat Dr	CONTRACTOR: West Hazmat Drilling		DRILLING MEIHOD: H.S.A.		
	акта	in, c	A			DRILLER: Randy Reidhead	DRILLER: Randy Reidhead		CME-75		
						START: 12:30/01	-19- 90	COMPLETED:	2:00/01-19-90		
LA OW	ND NER:	Shel	1 0il	Company	Į.	SURFACE ELEVATION: 21.1	9	LOGGED BY: Hal Hanser	1		
SI	SN	B C	SI	SR				CONTAMINANT			
SAMPLE	MARER	COUNTS BLO¥	SI ANT PL E(ft)	S R M C O V P (in)	DEPIH SCALE 1"= 4'	DESCRIPTIONS OF AND CONDITION	MATERIALS ONS	INSTRUMENT: OVM UNITS: ppm	OBSERVATION		
	- 1.		13(10)	2(11)		Asphalt road bas	e .	oritto. blam	<u>.</u>		
					1	CIAY; very dark of plastic, slighly		1			
		:			2 +	plastic, slighly (CH)	moist —	1			
					3 🛨 -		<u>-</u>		!		
					4			1			
CA	MW- 9- 1	9/ 23/ 27	5.0 - 6.5	10	5	SANDY CLAY; yello moderately plast moist (CL)	owish brown, ic, slightly	0	No odor		
	1	27			6	moist (CL)	•				
					\(\frac{1}{4}\)						
					8		-	1	1 i		
~	3.67.7	101	10.0	1.	9 +		•	1,,,			
CA	₩- 9- 2	16/ 21/ 31	10.0- 11.5	18	10 +			30	Slight odor		
	4	2T			11 +		•		ľ		
					13		-	1			
					14				<u> </u>		
CA	MU-	5/	15.0-	18	15	STIMV CIAV+ dark	vellowish -	0	No odor		
.	MW- 9- 3	5/ 9/ 12	15.0- 16.5		16	SILTY CLAY; dark brown, slightly p saturated (CL)	plastic] ~	100 0001		
	,	3.2.			17	Sacaracea (CD)					
					18	-					
					19		_]			
CA	MW-		20.0-	18	20			0	No odor		
۵.	9- 4		21.5		21			ľ			
	-				22	Total Depth at 2	1.5 feet —	1			
					23		 -				
					<u> </u>	T	•		<u> </u>		
-	WATER LEVEL DATA		GEOLOGI								
DA		02-			- Wal	Hansen					
		11:			SIGNATUR						
GW.		9.0	<u>-</u>		Hal Hans	en					
CASING DEPIH		20	,		TYPED NA	ME					

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APPENDIX B

Monitoring Well Construction Details

INSTALLATION OF FLUSH GRADE MONITORING WELL

PROJECT Oakland Shell 3420 San Pablo Av	/e	MONITORII ELEVATIO	ו פחד יצעו	J. MW-5 DF RISER 20.91 D LEVEL 21.29
DELTA NO. 40-88-666	PROTECTIVE CASING	•		•
- 1 - 1	LENGTH THICKNESS AND TYP	CONSTRUCTION R AND HATERIAL TUTAL LENGTH ABOVE GROUND E OF SEAL DINT TYPE OF RISER	9 inc 1/4 i 1-foo PPPE 4 inc threa	nch t concrete h PVC. filush
	THICKNESS AND TYPE OF S DISTANCE OF FILTER SAND TYPE OF FILTER AROUND S MONITORING VELL MATERIA SCREEN GAUGE OR SIZE OF DIAMETER AND LENGTH OF	ABOVE TOP DF SCR SCREEN AL F OPENINGS (SLUT SI	#3 cl sch 4 0.01	emintine O. PVC
 - 	- DEPTH TO THE BOTTON OF - DEPTH TO THE BOTTON OF - THICKNESS AND TYPE OF :	FILTER SAND	25 fe 25 fe N/A	et
0.25 FT.	- DEAHETER OF MOREHOLE	MONITORING VE	10 in	EVEL MEASUREMENTS
4.75 FT.		DATE	TIME	VATER LEVEL *
20.0 FT.		2-2-90	11:59	7.89
DATE 1-19-90 TIME 240		Delta Covironmental — Consultants, Inc.	HEASURE POINT!	Top of casing

INSTALLATION OF FLUSH GRADE MONITORING WELL

PROJECT Oakland Shell MONITORING WELL NO. MW-6 3420 San Pablo Ave ELEVATIONS: TOP OF RISER 22.32 GROUND LEVEL 22.63 DELTA NO. 40-88-666 PROTECTIVE CASING LICKING VATER TIGHT CAP - FLUSH GRADE VELL CONSTRUCTION 12 inch steel DIAMETER AND MATERIAL 9 inches TOTAL LENGTH 1/4 inch LENGTH ABOVE GROUND 1 foot concrete - THICKNESS AND TYPE OF SEAL BIAMETER, MATERIAL AND JOINT TYPE OF RISER PIPE 4 inch, PVC, flush thread sand cement TYPE OF BACKFILL AROUND RISER 1 foot bentonite - THECKNESS AND TYPE OF SEAL 1 foot DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN #3 clemintine TYPE OF FILTER ARCUNB SCREEN sch 40 PVC HONETORING VELL HATERIAL 0.01 inch SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE) -4 inch 15 feet BIAMETER AND LENGTH OF SCREEN 20 feet - DEPTH TO THE BOTTOM OF MONITORING VELL.

L1 = .	0.25	FT.
	4.75	FT.
	15.0	гт.
L 4 • -	20.0	FT.
•		• • • • • • • • • • • • • • • • • • • •

INSTALLATION COMPLETED

DATE	1-19-90
TDE	10:00

MUNITURING VELL VATER LEVEL MEASUREMENTS							
DATE	TIME	WATER LEVEL #					
2-2-90	11:41	7.86					
· · · · · · · · · · · · · · · · · · ·							
							

MEASURE POINT TOD of casing

20 feet

10 inches

N/A

Delta Environmental Consultants, inc.



DEPTH TO THE BOTTOM OF FILTER SAND

- THICKNESS AND TYPE OF SEAL

- DIAMETER OF BUREHOLE

INSTALLATION OF FLUSH GRADE MONITORING WELL

PROJECT __Oakland Shell MONITORING WELL NO. MW-7 3420 San Pablo Ave ELEVATIONS: TOP OF RISER 20.36 GROUND LEVEL 20.76 DELTA NO. _40-88-666 PRETECTIVE CASING LECKING VATER TIGHT CAP - FLUSH GRADE VELL CONSTRUCTION 12 inch steel DIAMETER AND MATERIAL 9 inches TOTAL LENGTH 1/4 inch LENGTH ABOVE GROUND 1 foot concrete - THICKNESS AND TYPE OF SEAL - DIAMETER NATERIAL AND JOINT TYPE OF RISER PIPE 4 inches PVC, flush thread sand cement - TYPE OF BACKFILL AROUND RISER 1 foot bentonite - THICKNESS AND TYPE OF SEAL #3 clemintine TYPE OF FILTER AROUND SCREEN sch 40 PVC MONITORING VELL MATERIAL 0.01 inch SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE) 4 inch 15 feet DIAMETER AND LENGTH OF SCREEN 20 feet DEPTH TO THE BOTTOM OF MONITORING VELL 20 feet DEPTH TO THE BOTTOM OF FILTER SAND N/A THICKNESS AND TYPE OF SEAL 10 inches - BEAMETER OF BOREHOLE 0.25 MONITORING WELL WATER LEVEL MEASUREMENTS 4.75 DATE TIME VATER LEVEL # 2-2-90 11:52 8.91 15.0 20.0 INSTALLATION COMPLETED 1-19-90 m MEASURE POINT top of casing 12:00 TDE Environmental

Consultants, inc.

INSTALLATION OF FLUSH GRADE MONITORING WELL

PROJECT Oakland Shell MONITORING WELL NO. MW+8 ELEVATIONS: TOP OF RISER 20.95 3420 San Pablo Ave GROUND LEVEL 21.14 DELTA NO. 40-88-666 PRITECTIVE CASING LOCKING VATER TIGHT CAP - FLUSH GRADE VELL CONSTRUCTION 12 inch steel DIAMETER AND MATERIAL 9 inches TOTAL LENGTH 1/4 inch LENGTH ABOVE GROUND 1 foot concrete - THICKNESS AND TYPE OF SEAL - DIAMETER MATERIAL AND JOINT TYPE OF RISER PIPE 4 inches PVC. flush thread sand cement - TYPE OF BACKFILL AROUND RISER 1 foot bentonite THICKNESS AND TYPE OF SEAL DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN 1 foot #3 clemintine TYPE OF FILTER AROUND SCREEN sch 40 PVC HONITORING VELL HATERIAL 0.01 inch - SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE) 4 inch 15 feet · DIAMETER AND LENGTH OF SCREEN 20 feet DEPTH TO THE BOTTON OF HONITORING VELL 20 feet - DEPTH TO THE BOTTOM OF FILTER SAND N/A THICKNESS AND TYPE OF SEAL 10 inches - DIAHETER OF BOREHOLE MONITORING WELL WATER LEVEL MEASUREMENTS 0.25 4.75 DATE TIME WATER LEVEL # 15.0 2-2-90 11:49 7.32 20.0 INSTALLATION COMPLETED 1-18-90 m HEASURE POINT: top of casing TOIC _ 3:45

Environmentai
Consultants, inc.

INSTALLATION OF FLUSH GRADE MONITORING WELL

PROJECT Oakland Shell MONITORING WELL NO. MW-9 3420 San Pablo Ave ELEVATIONS TOP OF RISER 21.19 GROUND LEVEL 21.46 40-88-666 DELTA NO. PROTECTIVE CASING LIDCKING VATER TIGHT CAP FLUSH GRADE VELL CONSTRUCTION 12-inches, steel DEAMETER AND HATERIAL 9 inches TOTAL LENGTH 1/4 inch LENGTH ABOVE GROUND 1 foot concrete - THICKNESS AND TYPE OF SEAL 4 inches PVC, flush DIAHETER, HATERIAL AND JOINT TYPE OF RISER PIPE. thread sand cement - TYPE OF BACKFILL AROUND RISER 1 foot bentomite THICKNESS AND TYPE OF SEAL 1 foot DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN #3 clemintine TYPE OF FILTER AROUND SCREEN sch 40, PVC MONITURING VELL MATERIAL 0.01 inch SCREEN GAUGE OR SIZE OF OPENINGS (SLET SIZE) 4 inch - 15 feet DIAMETER AND LENGTH OF SCREEN 20 feet DEPTH TO THE BOTTOM OF MONITORING VELL 20 feet DEPTH TO THE BUTTOM OF FILTER SAND N/A THICKNESS AND TYPE OF SEAL 10 inches - BLAMETER OF BOREHOLE 0.25 MONITORING WELL WATER LEVEL MEASUREMENTS 4.75 DATE TIME VATER LEVEL * 2-2-90 15.0 11:43 9.02 20.0

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Consultants, Inc.

* HEASURE POINT: top of casing Environmental

INSTALLATION COMPLETED

DATE

TDIE

1-18-90

2:00

APPENDIX C

Laboratory Analytical Reports Soil Samples



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063 (415) 364-9600 • FAX (415) 364-9233

Delta Environmental Consultants 3330 Data Drive Rancho Cordova, CA 95670 Attention: Hal Hansen

Project: #40-88-66601, Shell, Oakland

Enclosed are the results from 5 soil samples received at Sequoia Analytical on January 23,1990. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
12688	Soil, MW-9-2	Jan 18-19, 1990	EPA 5030/8015/8020
12689	Soil, MW-8-1	Jan 18-19, 1990	EPA 5030/8015/8020
12690	Soil, MW-7-1	Jan 18-19, 1990	EPA 5030/8015/8020
12691	Soil, MW-6-1	Jan 18-19, 1990	EPA 5030/8015/8020
12692	Soll, MW-5-1	Jan 18-19, 1990	EPA 5030/8015/8020

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Vickie Tague⁽⁾ Project Manager



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063 (415) 364-9600 • FAX (415) 364-9233

Delta Environmental Consultants

3330 Data Drive

Rancho Cordova, CA 95670 Attention: Hal Hansen Client Project ID: Matrix Descript: #40-88-66601, Shell, Oakland

Soil

Analysis Method: EPA 5030/8015/8020

First Sample #: 001-2688

Sampled:

Jan 18-19, 1990

Received: Analyzed:

Jan 23, 1990 Jan 25-30, 1990

Reported: Jan 31, 1990

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
001-2688	MW-9-2	6.1	N.D.	N.D.	0.44	0.39
001-2689	MW-8-1	N.D.	N.D.	N.D.	N.D.	N.D.
001-2690	MW-7-1	14	0.078	N.D.	N.D.	0.21
001-2691	MW-6-1	N.D.	N.D.	N.D.	N.D.	N.D.
001-2692	MW-5-1	5.0 _	N.D.	N.D.	N.D.	N.D.

0.05 0.1 0.1 0.1	•	ection Limits:
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Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard. Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague Project Manager

12688.DLT <1>

Sample Identification/Field Chain of Custody Record

DELTAENVIRONMENTAL CONSULTANTS, INC.

Project:			fell					W.O.	* 40-8	18-666 or 45
Shipped by: Shipped to: Comments:	greyt Lega	MA	Sal						ion of: dous material	s suspected? (yes/no)
	mpling Point		Locati	on		Field ID #	Date	Sample Type	No. of Containers	Analysis Required
3420 80	en Pabo	o	Oablano	l	N	1W-9-2 10°	1-18-90	soil	/	TPHIBIXE "COSCOLLA
						1.W-8-75	1718-90	soil	1	TPH BTYE
,				$\dot{\Omega}$	11	W-7-L 5	1-19-90	soil	İ	TAMBIXE
				O	N.	IW-621-5'	1-19-90	soil	-	TPH+BIXE
	/				٨	1W-5-1 5'	1-19-90)	soil		TPHIBIXE TOLOG
			'- 	7	i	<u>_</u>				
78	······································			V			7	<i></i> -		
							U			
Sampler(s) (signa	ature) 2	al	Hanse	in	,	A company	0			
Field	•		Relinquished by: (Received by: (s	1	Date/	Time	Comments
	•	Ha	Ware	en		BreadhOlin		1-22-90	230 -	51/23 130 i
				•	1	t j	1, 0			300
							1 6			
Sealed for shipm	ent by: (signa	iture)	gdal 9	land	Eny	Date/Time 1:	-11-90 B	O Shipmen	t method: $\underline{\mathcal{G}}$	reclosed.
Received for Lat	by: (signatur	e)		\		Date/Time		Commen	ts	· · · · · · · ·
M					···	D ' 1	かどう	-		·
							15 V	`		
			Receiving L	.aboratory: Pl	ease I	return original form afte	r signing for rece	ipt of samples.		

APPENDIX D

Site Field Activity Memo Worksheets

SITE FIELD ACTIVITY MEMO WORKSHEET

DATE:	
TO:	
ATTN:	!
SUBJ: SITE FIELD ACTIVITY MEMO	
Oakland Shell (Project name)	
3420 San Pablo Ac (Location)	
Oskland, CA	
40-88-666.0/ (Delta No.)	
Delta Project Manager: Hal Hanson	
Date of Field Activity: 01-23-90	
Delta On-Site Coordinator: Bo Pallon	
Personnel at Site and Affiliation:	
Bo Vaken- Deles	
Branden Potest - Polts	
	
Description of Field Activities:	
- colpet unter samples from All maritaring	2 com/ls
- collect soil spriphs from soil studie	
- survey monthering notes 5, 6, 7, 8, 9	
Brief Summary of Results:	. ,
- monitoring well I was not sampled	browse
	
·	
If you have any questions, please call me at 612/636-2427.	
Sincerely,	
·	1
DELTA ENVIRONMENTAL CONSULTANTS, INC.	
Name: (Ames W Paffor	
Title:	

SITE SAMPLING / VISIT CHECKLIST

SITE: OAKland Shell	
Date: 01-23-90	Time Arrived at Site: Time Departed from Site:
Weils Sampled:	mn's 2,2,3,4,5,6,7,8,9
Order in Which Wells Were Sampled:	MN-2,8,6,9,7,4,3,5
Date and Time Samples Shipped:	01-24-90/900
Carrier Samples Were Shipped By:	6-reshound
Parameters to be Sampled For:	BTEX TPH(GAS)
Water Level Data Sheets Attached:	Yes No
Sampling Data Sheets Attached: Number of Sheets:	Yes No
Chain of Custody Attached:	Yes No
Any Problems or Comments because	MN-1 was not sample it contained product . OI'

Sampling Information Sheet

Weather Conditions						
Cloud Cove	": NONE					1
Wind Speed	Zrro					
Temperatur	<u> 60</u>					
Sampling point:/	mw-2		Project	\$		
Locations					666.01	
Sample 104: MW-2						AH / PH
Describe sampling p						mn - 6
garrellel	to 35	en 52,				
Well depth:	9,20	ft.	below MP Casing	diameter:		Inches
Depth to water (beld						AH / PH
Discharge rate =						
At least	7	- //	_ gps x v.vozzu			
Sampling method:						'
·						
Pump intake or bail						
Tubing (type:						(yesno)
and all ffeld measu	· • · · · ·					
Sample appearance:	Silty Sw.	~ <i>N</i>	Odor:_	Nove		
Note any sampling p						
Note any cleaning p					between	401/5
Samples collected:	2- 104	is BTZ	K & TPH		· · · · · · · · · · · · · · · · · · ·	
		SVACTIATI	ON/STABILIZATION T	ECT DATA		
Time	pH Units	Temperature Corrected Conductance (umnos/cm)	Temperature (oC)	Water Level (Hearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)
10:50				8.30		
70,00	<u> </u>				21.35	
11:15				17,64		
				7.7.0		
		50		070		
Bailing star	t time: 10	<u> </u>	VL	8.30		
Bailing stop	time: ///	<u> </u>	WL	17.64		<u> </u>
						1
Comments:				· · · · · · · · · · · · · · · · · · ·		
Cosmen(s:						
Comments:						
Transportation (the)):			lon Policit	

Sampling Information Sheet

Venther Condition:						
Cloud Cover:	NONO	<u></u>				
Wind Speed:	2110	<u></u>				
Temperature:	60°			_		
Sampling point:	MW-5		Project	OAHIAN	d Shell	
Location: OAK			¥.0. #:	40-88-	666	
Sample IDS: MW-3	1012390/	Date so	expled: <u>0/123</u> 1	90 time: 14	V.130	AH / PH
Describe sampling poin	,					reporty
Near Pho.	ne boo	16			,	
Well depth:	1.82	ft.	below MP Casing	diameter: 4))	inches
Depth to water (below	MP) 7.8	39 ft.	Date: <u>0/</u> <u>/23</u> /	90 Time: 14	<u>় (১ ি</u>	AH / PH
Discharge rate *			_ gpm x 0.00223 =		··	cfs.
At least 3 u	JELL	b	ore volumes have b	een evacuated bef	ore sampling.	
Sampling method:	Ταρ	Submer	sible pump	21 Bailer	Other: .	
Pump intake or bailer						•
Tubing (type:), (n	ew or previously u	sed) was used to	collect all samples	(yesno)
and all field measure						
Sample appearance:	Cu	OUDY	Odor:_	NOUE	2	
Note any sampling pro	blens:	·	<u></u>			
					between	wells
Note any cleaning per Samples collected:						and the
		VIALS F	on Fuel	FINGERF		unells
		U) ALS F	ON FUEL ON/STABILIZATION 1	FINGERF	em ,	cu+lls
	2 von	UNALS F	ON FUEL ON/STABILIZATION 1	FI.UCEL FA	Cumulative Volume of Vater	
		U) ALS F	ON FUEL ON/STABILIZATION 1	FIUCEL FA	Cumulative	Pumping Rate (gpm)
Samples collected:	2 Von	EVACUATION Temperature Corrected Conductance	ON FUEL ON/STABILIZATION 1	FINCELFA Water Level (Nearest 0.01 ft.)	Cumulative Volume of Vater Removed from	Pumping Rate
Samples collected:	2 Von	EVACUATION Temperature Corrected Conductance	ON FUEL ON/STABILIZATION 1	FINCELFA Water Level (Nearest 0.01 ft.) 7.89	Cumulative Volume of Vater Removed from Well (gallons)	Pumping Rate
Samples collected:	2 Von	EVACUATION Temperature Corrected Conductance	ON FUEL ON/STABILIZATION 1	FINCELFA Water Level (Nearest 0.01 ft.)	Cumulative Volume of Vater Removed from Well (gallons)	Pumping Rate
Samples collected:	2 Von	EVACUATION Temperature Corrected Conductance	ON FUEL ON/STABILIZATION 1	FINCELFA Water Level (Nearest 0.01 ft.) 7.89	Cumulative Volume of Vater Removed from Well (gallons)	Pumping Rate
Samples collected:	2 Von	EVACUATION Temperature Corrected Conductance	ON FUEL ON/STABILIZATION 1	FINCELFA Water Level (Nearest 0.01 ft.) 7.89	Cumulative Volume of Vater Removed from Well (gallons)	Pumping Rate
Time 14:15 14:30	2 Von	EVACUATION FOR CONTRACT CONTRACT (UMPOS/CM)	ON FUEL ON/STABILIZATION 1 Temperature (oC)	FINCEL FA	Cumulative Volume of Vater Removed from Well (gallons)	Pumping Rate
Time 14:15 14:15 14:30 Bailing start	2 von	EVACUATION FOR CONTRACT CONTRACT (UMPOS/CM)	ON FUEL ON/STABILIZATION 1 Temperature (oC)	FINCELFA Water Level (Nearest 0.01 ft.) 7.89 18.84	Cumulative Volume of Vater Removed from Well (gallons)	Pumping Rate (gpm)
Time 14:15 14:15 14:30 Bailing start	2 Von	EVACUATION FOR CONTRACT CONTRACT (UMPOS/CM)	ON FUEL ON/STABILIZATION Temperature (oC)	FINCEL FA	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)
Time 14:15 14:15 14:30 Bailing start	2 Von units time: 141 ime: 141	EVACUATION FOR THE CONTRACTOR (URROS/CRI)	ON FUEL ON/STABILIZATION 1 Temperature (oC) Vt	FINCELFA Water Level (Nearest 0.01 ft.) 7.89 18.84	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)
Time 14:15 14:15 14:30 Bailing start Bailing stop t	2 Von units time: 141 ime: 141	EVACUATION FOR THE CONTRACTOR (URROS/CRI)	ON FUEL ON/STABILIZATION 1 Temperature (oC) Vt	FINCELFA Water Level (Nearest 0.01 ft.) 7.89 18.84	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)
Time 14:15 14:15 14:30 Bailing start Bailing stop t	2 Von units time: 141 ime: 141	EVACUATION FOR THE CONTRACTOR (URROS/CRI)	ON FUEL ON/STABILIZATION Temperature (oC) VL	FINCEL FA Water Level (Nearest 0.01 ft.) 7.89 18.84	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)
Time 14:15 14:15 14:30 Bailing start Bailing stop t Comments:	2 von	EVACUATION FOR CONTRACTOR (URROS/CR)	ON FUEL ON/STABILIZATION 1 Temperature (oC) VL	FINCEL FA EST DATA Water Level (Nearest 0.01 ft.) 7.89 18.84 7.89 /8:84	Cumulative Volume of Vater Removed from Well (gallons)	Pumping Rate (gpm)
Time 14:15 14:15 14:30 Bailing start Bailing stop t	ph units time: 141 ime: 141	EVACUATION FOR CONTRACT CONTRA	ON FUEL ON/STABILIZATION Temperature (oC) VL	FI.UCEL FA Water Level (Nearest 0.01 ft.) 7.89 18.84	Cumulative Volume of Vater Removed from Well (gallons)	Pumping Rate (gpm)

Sampling Information Sheet

Describe sampling point: Well Hearted in Northwart corner of people Describe sampling point: Well Hearted in Northwart corner of people Describe sampling point: Well Hearted in Northwart corner of people Describe sampling point: Well described in the people of the below NP Casing diameter: I include the people of the peopl	amether Condition:			•			
Temperature: 60 Impling points: 100	Cloud Cove	r: Non	e				
project: WWW Stand	Wind Speed	1: <u>Zero</u>)				
positing points: MNV-8 positions: Delland positions: Delland positions: Delland positions: Delland positions: Delland positions: MNV-80 pos	Temperatur	•: <u>60°</u>					
positions Ophland Vid. 8: 40-88-666 Imple 108: Mr. Solicita 11/3 2 Date sempled: CVI 21/8 Time: 1/3 2 AN / searche sampling points: W// Heathor in Worthwart Corner of people sell depth: 19.99 ft. below NP Casing diseasers: 4/ Inc. Semple to water (below NP) 7/9 ft. below NP Casing diseasers: 4/ Inc. Semple to water (below NP) 7/9 ft. below NP Casing diseasers: 4/ Inc. Semple special at a semple semple semple social and at semple sem	ampling point:	mn-8		Projec	<u>Oa</u>)	fland 5	2011
seption 108: MN-2/012386/1/32 Date sempled: (A) 23 % Time: //32 AM / searcibe sempling point: Well Search of Northwart corner of perfect of sempling point: Well Search of Northwart corner of perfect of sempling sempling point: Well Searce (below MP) 7/9 ft. Date: (A) 23/3 % Time: //2/ AM / pischarge rate =				v.o. #	<u>40-88-</u>	666	
Secretive sampling point:	iemie ID#: /n/v	-8/012390/11					AH / PI
Septit to water (below MP)	escribe sampling p	wint: we	11 tour	ted in	Northur	t corner	of proper
Seph to water (below MP)							
Sincharge rate =	Hell depth:	19.99	ft.	below MP Casing	diameter:		inche
Least	epth to water (bel	ION MP)	<u>19</u> ft.	Date: 0/123/	90 Time:	11:21	AH / PI
Suppling method:)ischarge rate =	1	,	gpm x 0.00223 =			cfs.
Sampling method:	lt least	3 401	/			,	
Puping (type:	Sampling method:	Tap	Suitme	rsible pump ,	Bailer	Other:	
Transportation (thermal preservation):							
Transportation (thermal preservation); Lample at ffeld measurements (_Yesno). Tubing used only for: Lample appearance: Silv branc						collect all samples	(yesno
Despite appearance: Silly blown Odor: Worke State any sampling problems: Service any cleaning performed in field: EVACUATION/STABILIZATION TEST DATA Temperature Corrected Hater Level Volume of Variety Conductance (Mearest Removed from Quality (unnow/cs) (oC) 9.01 ft.) Hell (gallons) (gps) 1/2/							
Hote any sampling problems: Hote any cleaning performed in field:							
Samples collected: 2- Non Nints - PSTEX TPH EVACUATION/STABILIZATION TEST DATA Temperature Corrected Conductance Temperature (Nearest Removed from Pumping Rate (umnos/cm) (oc) 0.01 ft.) Well (gallons) Pumping Rate (pm) (pm) (pm) (pm) (pm) (pm) (pm) (pm)	,						
EVACUATION/STABILIZATION TEST DATA Temperature Corrected Conductance Temperature (Mearest Removed from Units (Units (Units)) (OC) (OC) (OC) (OC) (OC) (OC) (OC) (O	tore any sampling ;		. 41" 6	aler cl	and	between a	11/15
Temperature							
Temperature Conductance Temperature Conductance	amples collected:				<u> </u>		
Transportation (thermal preservation):			EVACUAT	ION/STABILIZATION	TEST DATA		
//:2/ //:32 Bailing start time: //i2/ VL 7//9 Bailing stop time: //:32 VL /8:98 Comments:	Time	• .	Corrected Conductance	Temperature	(Nearest 0.01 ft.)	Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)
//:32	11:21						
Bailing start time: //i2/ WL 7/9 Bailing stop time: ///32 WL /8/98 Comments:	77.27			-			
Bailing start time: //iZ/ VL 7/9 Bailing stop time: ///32 VL /8'98 Comments: Transportation (thermal preservation):	11:30				18.98	25 501	
Bailing stop time: //:32 WL /8,98 Comments: Transportation (thermal preservation):		<u></u>					
Bailing stop time: //:32 WL /8,98 Comments: Transportation (thermal preservation):							
Bailing stop time: ///32 VL /8,98 Comments:			ナラノ		719		
Comments:	Bailing star	rt time:	1121	vt	10100		
Transportation (thermal preservation):	Bailing sto	p times //	132	W	18,98		
Transportation (thermal preservation):							
Transportation (thermal preservation):	Coments:						
Transportation (thermal preservation):						·	
Transportation (thermal preservation):		· · · · · · · · · · · · · · · · · · ·					
form Completed by: Samoled by: Ann don Palet	[ransportation (th	ermal preservation	n):		Λ	/ /s /-	L

1011/1-80

Sampling Information Sheet

	r: None					
	d: <u>7876</u>					·
	re: <u>60°</u>					
Sampling point:	mw-3				un SHELL	
Locations Op	KLAUD CA				4	
Sample IDS: MU	<i>U</i> -3	Date :	sampled: 1123/4	70 Time: 12	7.05	AH / PH
Omscribe sampling	point: well	located	WEAR SOW	the east c	erner of	station
building			·			·
Well depth: 20	6.73	ft.	below MP Casing (diameter:	L1/	inches
Depth to water (be	LOW HP) <u>9.04</u>	<u>1</u>	Date: 1 23/5	70 Time:	13:30	AH / PH
Discharge rate = _			_ gpm x 0.00223 * ,		· · · · · · · · · · · · · · · · · · ·	cfs.
At least	3 wece	1	bore volumes have b	een evacuated bef	ore sampling.	•
Sampling method: _	Tap	Subme	rsible pump	Z' Bailer	Other:	
Pump intake or bail	ler set at		ft.	below MP		•
Tubing (type:	LASTIC		new or previously us	sed) was used to	collect all samples	(<u>yes</u> no)
and all field measu						1
Sample appearance:		_				·
Note any sampling ;	problems:					:
Note any cleaning ;	performed in field	1: 4" pu	ge bailir	cleaned	botum	wells
Samples collected:	2 VM VI	ALS FOR F	FUEL FINE	ERPRINT		
		EVACUATI	ICH/STABILIZATION TE	EST DATA		•
		Temperature Corrected	••.	Water Level	Cumulative Volume of Vater	1
Time	pH	Conductance	Temperature	(Nearest		
7,000	Units	(LEEDOS/cm)	•	•	Removed from Weil (dailors)	Pumping Rate
12.72	Uni ta	(Umnos/cm)	(%€)	0.01 ft.)	Removed from Weil (gallons)	Pumping Rate (gpm)
13:30	Units	(UMPOS/cs)	•	9.04	Weil (gallons)	1
13:30 14:05	Uni (S	(Umnosi/ca)	•	0.01 ft.)		1
	Units	(Ustrost/cs)	•	9.04	Weil (gallons)	1
	Units	(Umnos/cm)	•	9.04	Weil (gallons)	1
14.05			•	9.04	Weil (gallons)	1
IA 05	rt time: /3	1.30	(00)	9.04	Weil (gallons)	1
IA 05	rt time: /3	1.30	(oc)	9.04 10.60	Weil (gallons)	1
IA 05		1.30	(oc)	9.04 10.60 9.04	Weil (gallons)	1
IA 05	rt time: /3	1.30	(oc)	9.04 10.60 9.04	Weil (gallons)	1
Bailing star	rt time: /3	1.30	(oc)	9.04 10.60 9.04	Weil (gallons)	1
Bailing star	rt time: /3	1.30	(oc)	9.04 10.60 9.04	Weil (gallons)	1
Bailing star Bailing stor Comments:	rt time: /3 p time: 14:	30	(oc)	9.04 10.60 9.04 9.04 0.60	Seil (gallons)	1
Bailing star Bailing stor	rt time: /3 p time: 14:	30	(oc)	9.04 10.60 9.04	Seil (gallons)	1

Sampling Information Sheet

Cloud Cove	مناحدات الما					
	er: NONC					
Wind Space	: Zero					
Temperatu	re: <u>60°</u>					
Sampling point:			Project	: OAKI	and She	//
Locations OP	Kland		W.G. #1	40-88-	666	
Semple 108: hn						AH / PH
Describe sampling ;						· · · · · · · · · · · · · · · · · · ·
Well depth:	19.90	ft.	below MP Casing	diameter:	4	inches
Depth to water (bel	low MP) 7/3		_			AH / PH
Discharge rate = _						
At least		b	_			
Sampling method: _					,	
Pump intake or bail				•	valer.	
•						
Tubing (type:						(
and all ffeld measu						<u> </u>
Sample appearances		<u>~~</u>	Odor:_	NONP		
Note any sampling p	oroblens:	1111 1	- /	- ,		
					turn ut	//5
Samples collected:	2 VOA	VIBIS -	151EX 11	<u> </u>		
		EVACUATI	CN/STABILIZATION T	TEST DATA		
9ina	pH Units	Temperature Corrected Conductance	Temperature	Water Level	Cumulative Volume of Vater	
Time	onics	(umnos/cm)	(oC)	(Mearest 0_01 ft.)	Removed from Well (gallons)	Pumping Rate (gpm)
	Office	(umnos/cs)	`	0.01 ft.)		
11:41	on ts	(uanos/ca)	`			
	units	(uanos/ca)	`	0.01 ft.) 7.57	Weil (gailons)	
	Units	(uanos/ca)	`	0.01 ft.)	Weil (gailons)	
	WII CS	(uanos/ca)	`	0.01 ft.) 7.57	Weil (gailons)	
11:55			(oc)	0.01 ft.) 7.57 18:13	Sell (gailons)	(950)
//:4// //:55	rt time://	1:41	(oC)	1.57 18:13	Sell (gailons)	(950)
//:4// //:55		1:41	(oC)	1.57 18:13	Sell (gailons)	(950)
Sailing star	rt time: //	7:41	VI	1.57 18:13	Sell (gailons)	(950)
//:4// //:55	rt time: //	7:41	VI	1.57 18:13	Sell (gailons)	(950)
Sailing star	rt time: //	7:41	VI	1.57 18:13	Sell (gailons)	(950)
Sailing star Sailing stor	rt time:	7:4/	(oC)	1.57 18:13	Sell (gailons)	(959)
Sailing star	rt time: //	7:4/	(oC)	1.57 18:13	Sell (gailons)	(950)

Sampling Information Sheet

Sampling method:	Yeather Condition:						•
Temporature: 60° Sempling point: MA)-9 Project: DALLEAND Shell Location: MAK Linab CALIF Lin, 8: 40-88-1466 Respiration: MAK Linab CALIF Lin, 8: 40-88-1466 Respiration: MAK Linab CALIF Lin, 8: 40-88-1466 Respiration: MAK Linab CALIF Line Line Line Line Line Line Line Line	Cloud Covers	None		····			,
project: MALTAND STECK consisting point: MALTAND CALIF Location: MALTA	Wind Speed:	2010					
project: MAP Project: MAP Project: MAP MAP MARK Learn MAP Project: MAP MARK Learn CALIF U.G. \$1 AD SP JAB MAP Project MAP Proj	Temperature	60.					
Constitution of the control of the c				Project	: OAKLAL	on Shell	
Determine 108: MW-9-12390 Determine Search 12390 Time: 12:40 Determine sempling point: Well Good On 35 Street Determine sempling point: Well Good On 35 Street Determine Street 19: 19:73			ALIF	W.O. #:	40-82	3-1de6	
Search sampling points w// Consider Strong dispetants of the below MP Casing dispetants of the sampling points w// Casing dispetants of the sampling method: Sampling method:				amiled: 1 / 23/9	70 Time: 12	2:40	AN / PH
And I depth: 19.73 ft. below MP Casing dispeter: 4" inches							
Depth to water (below MP) 9.3	Describe sampling po	int:	1012-1-				
Depth to water (below MP) 9.3		1977		halas was dealers	4	/1	Inches
Samples appearance: Samples appearance: Samples S	Well depth:	1. 1J					
bore volumes have been evacuated before sampling. Sampling method:	Depth to water (below -	H HP)					-
Sampling method:	_						crs.
Trubing (type:							
Tubing (type:	Sampling method:	Tap	Submer	sible pump _	Bailer	Other:	
and all field measurements (Yesno). Tubing used only for:	,						
Sample appearance: Note any cleaning performed in field: Whose any cleaning performed in field: Whose any cleaning performed in field: EVACUATION/STABILIZATION TEST DATA Temparature Corrected Corductance Time Units Conductance Corductance C							
Sample appearance: Note any cleaning performed in field: Whose any cleaning performed in field: Whose any cleaning performed in field: EVACUATION/STABILIZATION TEST DATA Temparature Corrected Corductance Time Units Conductance Corductance C	and all field measur	ements (Yes _	no). Tubing	used only for:	MW-9		
Note any cleaning performed in field: 4" bailer Cleaned between wells Samples collected: Z VOA IIA (5 BTEX TPH) EVACUATION/STABILIZATION TEST DATA Temperature Corrected Corductance Temperature (Nearest Removed from Well (gallons) (gcm) /2:15 /2:15 /2:15 /2:35 /2:40 Bailing start time: 12:15 Bailing stop time: 12:40 VL 16.65					· · · · · · · · · · · · · · · · · · ·	. <u> </u>	
Note any cleaning performed in field: 4" bailer Cleaned between wells Samples collected: Z VOA IIA (5 BTEX TPH) EVACUATION/STABILIZATION TEST DATA Temperature Corrected Corductance Temperature (Nearest Removed from Well (gallons) (gcm) /2:15 /2:15 /2:15 /2:35 /2:40 Bailing start time: 12:15 Bailing stop time: 12:40 VL 16.65	Note any sampling or	oblems:					
Samples collected: Z VOA VIA S STEX TPH	Note any cleaning DE	rformed in field	4" poil	Ter clear	red 50	from h	0/15
Time	Second of the section	7 VOD	111414	STEX	TPH		
Temperature Corrected Corrected Conductance Cond	Justice Contraction	· · · · · · · · · · · · · · · · · · ·					
Time Units Corrected Temperature Water Level Volume of Vater Removed from Pumping Rate (12:15			EVACUATI	CON/STABILIZATION T	EST DATA		
Time Units Conductance Temparature (Nearest Removed from Nett (gattons) (ggm)		•	•	i.	Unter Lauri		
12:15 9.31 0			Conductance		(Nearest	Removed from	
12:25 15.0 4=7 Rechae 12:35 5.0 16.65 5am/le		Uni ts	(Lignos/cm)	(oc)		Mett (Surtour)	(gpm)
12:35					4.31	0	
12:35	12:25		•				GET RECIPAL
12':40 16.65 Sample						5.0	
Bailing start time: 12:15 vt 9.31 Bailing stop time: 12:40 vt 16.65					16.65	SAMIE	
Bailing stop time: 12:40 vt 16.65							
Bailing stop time: 12:40 vt 16.65		12	1 12-		931		
	Smiling start	: time: /C	:10				
Coments:	Beilin∡ stop	time: PL	,40	v	10.00		
Comments:							
	Comments:						
							
Transportation (thermal preservation):							<u> </u>
Form Completed by: CB PUTEET Sampled by: BO PATTOU	Transportation (ther	mail preservation):		~	0	

Sampling Information Sheet

Weather Condition:						
Cloud Cov	or: NONE	<u>. </u>				
Wind Spee	d: Zrro					
	60°					
Sampling point:			Project	: OAKI	and shall	<u>/</u>
Location:			¥.0. #:	40-88	-666	!
Sample 108: <u>MN-</u>	7/017390/	Date :				AM / PH
\$300 1003 <u>////-</u>		1 lucas	1cd 40	Free 50	outh of	mn-8
pescribe sampling	point:					
Well depth:	19.47	ft.	below MP Casing	diameter:	4	inches
Death to vater (be	LOW MP) 6,9	B st.	Date: 0/ 123 /	90 Time:	12:29	AH / PH
						▲
At least			ore volumes have b			
At teast	720				Other:	
Pump intake or bai					collect all samples	(ves no)
						1
and all field meas						
Sample appearance:				7000F		
Note any sampling	bropraus:	1110 1	1/2	- / / -	here wel	//-
Note any cleaning	performed in field	l: 7 BE	TA	<u> </u>	<u> </u>	<u>ا د ،</u>
Samples collected:	Z-VOA U	11416. 15)	-x 11-4			
		EVACUAT	ION/STABILIZATION T	EST DATA		
	Hq	Temperature Corrected Conductance	:-, Temperature	Water Level (Nearest	Cumulative Volume of Vater Removed from	Pumping Rate
Time	Uni ts	(URNOS/CB)	(oC)	0.01 ft.)	Well (gallons)	(Stow)
12:29		<u> </u>		6,98		
		·				
12:45				18:56	25	
						i
	1	1		<u> </u>		
	. 12	79		698		
	rt time: 12		W	6,98		
	op time: 12.		VL	6,98 18,56		
Sailing sto	op time: 12."	45	WL	6,98 18,56		
Sailing sto		45	VI	6.98 18.56		
Sailing sto	op time: 12."	45	VL	6,98 18,56		
Sailing sto	op time: 12,'	45	WL	6,98 18,56		
Sailing sto	op time: 12."	45	Wt	6,98 18,56 ov: Bao Da	tton:	

Sampling Information Sheet

Weather Condition:

Cloud Cove	r: //o//C	-				
	1 700					
	•: <u>60°</u>					
mpling paint:	mw-1				D Shell	
cation:	KLHUD C	ALIF	v.o. #:	40-99	·(dolo	
ple ios: Mu	U·1 12390	Date s	empled: <u>//23/</u>	20 Time:		AH / PH
macribe sampling p	oint:					
					A / /	
oll depth:		ft.	below MP Casing	diameter:	4.'	inches
pth to water (bel	OH MP)	ft.	Date:	70 Time:		AH / PH
scharge rate =	·		_ gpm x 0.00223 =			cfs.
t least		b	ore volumes have b	een evacuated bef	ore sampling.	
ampling method: _	Тар	Submer	sible pump _	Z Bailer	Other:	
ump intake or beil	er set at		ft.	below MP		
					collect all samples	(yesno)
nd all field measu	rements (Yes	no). Tubing	used only for:	171W-1		-
mple appearance:		<u></u>	Odor:_	STRONG		
	oroblems:					
ote any cleaning ;	performed in field	d:				
emples collected:	FREE	Product.	-01	NO SAI	$n p l \epsilon$	
	·				V	!
		EVACUATI	ON/STABILIZATION T	EST DATA		
	-	Temperature Corrected	;•	Water Level	Cumulative Volume of Water	
Time	pH Units	Conductance (Umnos/cm)	Temperature (oC)	(Nearest 0.01 ft.)	Removed from Well (gallons)	Pumping Rate (gpm)
	- Company of the second of the	Ĭ				
						
]			1	<u> </u>		
Bailing sta	rt time:		VL	,01	Free Produ	12 1
Sailing sto	p time:		VL			
44 -	- a /a	Laker		, do to and	product	
aments: <u>R/C</u>	SAMPIC	LIANIPA V			7.32	
	,					· · · · · · · · · · · · · · · · · · ·
ranaportation (th	ermal preservation	n):		0 -	ndon Putl	104
orm Completed by:			Sampled	by: And	North Public	

Sampling Information Sheet

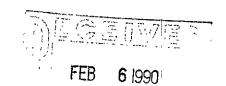
Weather Condition:

Cloud Cove	. None					
Wind Speed	: Zero					
Temperatur	60°					
Sumpling point:	mw-4		Project:	•		
Location: DA	KLIAND			<u>40-88-</u>		
Sample 104:	4/012390/1	3:05 Date se	mpled: 01/23/5	20 Time:	13:05	AH / PH
Describe sampling p	pint: nell	located	20 Fees	t south	of pump	Is/ands.
NCAT	sidenalk	of Spa	, PASIO A	rc		
Well depth:	23.06	ft. t	celow MP Casing d	ilameter:	4	inches
Depth to water (bel	low HP)	? <u>5</u>	Date: 0) 123 1 9	90 Time:	12:50	AH / PH
Discharge rate =			gpm x 0.00223 * _			cfs.
At least	WELL		pre-volumes have be	een evacuated befo	ore sampling.	
Sampling method:	Тар	Submers	sible pump	Bailer	Other:	
Pump intake or bail	ler set at		ft.	below MP		
Tubing (type:	PLASTIC_), (ne	ew or previously us	sed) was used to (collect all samples	(yesno)
and all ffeld measu						
Sample appearance:	Class	of Brown) Odor:_	moderate	-> strong	
Note any sampling (problems:					
Note any cleaning :				red be	then we	1/5
Samples collected:	2 von	VIALS PE	or FUEL			:
Samples collected:	2 Von		_	FINGERP		:
Samples collected:	<u>2 Von</u>	EVACUATIO	ON/STABILIZATION TO	FINGERP	Rint	:
	H4	EVACUATION Temperature Corrected Conductance	OM/STABILIZATION TE	FINGERP EST DATA Water Level (Hearest	Cumulative Volume of Water Removed from	Pumping Rate
Samples collected:		EVACUATION Temperature Corrected	OM/STABILIZATION TE	FINGERP EST DATA Water Level (Hearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate
12:50	H4	EVACUATION Temperature Corrected Conductance	OM/STABILIZATION TE	FINGERP EST DATA Water Level (Hearest	Cumulative Volume of Water Removed from	Pumping Rate
	H4	EVACUATION Temperature Corrected Conductance	OM/STABILIZATION TE	FINGERP EST DATA Water Level (Nearest 0.01 ft.) 9.25	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate
12:50	H4	EVACUATION Temperature Corrected Conductance	OM/STABILIZATION TE	FINGERP EST DATA Water Level (Hearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate
12:50	H4	EVACUATION Temperature Corrected Conductance	OM/STABILIZATION TE	FINGERP EST DATA Water Level (Nearest 0.01 ft.) 9.25	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate
12:50 13:05	pH Units	EVACUATION Temperature Corrected Concluctance (umnos/cm)	OM/STABILIZATION TE	Finger EST DATA Water Level (Nearest 0.01 ft.) 9.25	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate
12:50 /3:05	pH Units rt time: 12	EVACUATION Temperature Corrected Conductance (umnos/cm)	CM/STABILIZATION TE	Finbers Est Data Water Level (Nearest 0.01 ft.) 9.25	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate
12:50 /3:05	pH Units	EVACUATION Temperature Corrected Conductance (umnos/cm)	CM/STABILIZATION TE	Finbers EST DATA Water Level (Nearest 0.01 ft.) 9.25	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate
12:50 13:05 Bailing sta	pH Units rt time: 12 / p time: /3	EVACUATION Temperature Corrected Conductance (umnos/cm)	CM/STABILIZATION TE	Finbers Est Data Water Level (Nearest 0.01 ft.) 9.25	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate
12:50 /3:05	pH Units rt time: 12 / p time: /3	EVACUATION Temperature Corrected Conductance (umnos/cm)	CM/STABILIZATION TE	Finbers Est Data Water Level (Nearest 0.01 ft.) 9.25	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate
12:50 13:05 Bailing sta	pH Units rt time: 12 / p time: /3	EVACUATION Temperature Corrected Conductance (umnos/cm)	CM/STABILIZATION TE	Finbers Est Data Water Level (Nearest 0.01 ft.) 9.25	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate
12:50 13:05 Bailing sta Bailing sto	pH Units rt time: 12 p time: 13	EVACUATION Temperature Corrected Concluctance (umnos/cm)	CM/STABILIZATION TE	Finbers Est Data Water Level (Nearest 0.01 ft.) 9.25	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate
12:50 13:05 Bailing sta	pH Units rt time: 12 p time: 13 ecw AppA	EVACUATION Temperature Corrected Conductance (umnos/cm)	CM/STABILIZATION TE	Finger Est Data Water Level (Nearest 0.01 ft.) 9.25 /6.1/	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate

APPENDIX E

Laboratory Analytical Results Water Samples





Deita Environmental Consultants 3330 Data Drive Rancho Cordova, CA 95670 Attention: Hal Hansen

Project: #40-88-666, Shell, Oakland

Enclosed are the results from 8 water samples received at Sequoia Analytical on January 25,1990. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE OF COLLECTION	TEST METHOD
00113562 A	Water, MW-9	1/23/90	EPA 5030/8015/8020
0013555 A	Water, MW-2	1/23/90	EPA 5030/8015/8020
0013556 A	Water, MW-3	1/23/90	EPA 5030/8015/8020
0013557 A	Water, MW-4	1/23/90	EPA 5030/8015/8020
0013558 A	Water, MW-5	1/23/90	EPA 5030/8015/8020
0013559 A	Water, MW-6	1/23/90	EPA 5030/8015/8020
0013560 A	Water, MW-7	1/23/90	EPA 5030/8015/8020
0013561 A	Water, MW-8	1/23/90	EPA 5030/8015/8020

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Vickle Tague⁽⁾ Project Manager



SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063 (415) 364-9600 • FAX (415) 364-9233

Delta Environmental Consultants

3330 Data Drive

Rancho Cordova, CA 95670 Attention: Hal Hansen Client Project ID: Matrix Descript:

Analysis Method:

First Sample #:

#40-88-666, Shell, Oakland

Water

EPA 5030/8015/8020

001-3555 A

Sampled:

Reported:

Jan 23, 1990 Jan 25, 1990

Received: Analyzed:

Jan 29, 1990 Feb 2, 1990

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons μg/L (ppb)	Benzene μg/L (ppb)	Toluene μg/L (ppb)	Ethyl Benzene μg/L (ppb)	Xylenes μg/L (ppb)
0013555 A	WM-5	40,000	110	0.∂Q 9.6	140	3,300
0013556 A	MW-3	140	1.1	N.D.	N.D.	N.D.
0013557 A	MW-4	150	1.2	N.D.	N.D.	N.D.
0013558 A	MW-5	290	4.8	N.D.	N.D.	14
0013559 A	MW-6	33,000	460	100	9.3	1,600
0013560 A	MW-7	3,200	61	1.3	N.D.	1,600
0013561 A	MW-8	22,000	160	730	47	3,300
00113562 A	MW-9	88	N.D.	0.30	0.97	3.0

Detection Limits:	30	0.0 0	.3	0.3	0.3	0.3

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard. Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Vickie Tague Project Manager

Sample Identification/Field Chain of Custody Record

sipped by: $\frac{5600}{5600}$	After the transfer of the second of the seco	HUD (HUE		W.O. <u>;</u>	<u>* 40-88</u>	3-6/6 -30
omments:	MALARS		,		ion of: dous materials	s suspected? (yes/no)
Sampling Point	Location	Field ID #	Date	Sample Type	· No. of Containers	Analysis Required
1110-2	CAKTAND CHUR	- 11110-2 11:15	1- 23-90	WATER	17	FUECTICIENTA
HU-3-OKT	MALLABEYED ONE	Mabelled My 1 13:50) 2 0 1			Lembo
11W-4	-3	1110-4 13:05) 3		1.00
1111-5		mw-5 14:30				
1160-6		- 11110-6 11:55		-= 4	,	
71W-7	1	MW7 12:45	in P			C (42)
11W-8		MWE 11:32				; ; · · · · · · · · · ·
11W-9	,	1110-9 12:40	- V = 2	. 🖈	4	4 . 120
mpler(s) (signature)	Brenden Total	4550	- P P			
Field ID	Relinquished by: (signature)	Received by:		Date	T	Comments
11 SAUPLES	· Mida fita	Sife of it	<u> </u>	1415	17(1)	
-(15W-3		1 1 11 11		2	r,	
aled for shipment by: (signatur	rel The Day	Date/Time	1-24-90 10:	Shipmen	t method:	-ya KHCCOV)
ceived for Lab by: (signature)		Date/Time		Commen		
			RESULTS TO :	1/1/ / 3330 D	HOUSEN	DELTA ENINE

Receiving Laboratory: Please return original form after signing for receipt of samples.

15670

Sample Identification/Field Chain of Custody Record

DELTAENVIRONMENTAL CONSULTANTS, INC.

Project: Shipped by: Shipped to: Comments:	OD SHELL CHACK MINION CHASS	Huss CALIF		Attent	ion of:	3-(// /c
Sampling Point	Location	Field ID #	Date process	Sample Type	No. of Containers	Analysis Required
11110-2	CHRCHUD CHCIE	11110-2 11:15	1- 23-90	WATEL	2	FUELFACEIFI
11110-3		114.3 14:05				1
//W·4	,	1111-4 13:05				
11115	·	1110-5 14:30.				
11113-6	,	mui-le 11:55	/			
1110-7		11W7 12:45				\\
		11110-8 11:32				
1110-8 1110-9	4	1110-4 12:40	7	₩	4	Ą.
Sampler(s) (signature)	Brance John 1					
- Field ID	Relinquished by: (signature)	Received by:	(signature)	Date/	Time	Comments
JUSTANOLES (Much Tital		<u> </u>			
		<u> </u>				
Sealed for shipment by: (signature	e) Some to let	Date/Time	1-24-90 11:	$\frac{-}{2C}$ Shipmen	_ t method: <u>_</u>	CHERUNIA.
Received for Lab by: (signature)		Date/Time	·····	Commen		
	,		Resours To:	3330 D	17.7.15EU	December
· · · · · · · · · · · · · · · · · · ·				7		WELLA (A
	Receiving Laboratory: Pl	ease return original form at	ter signing for rece	int of samples		55670