Delta
Environmental
Consultants, Inc.

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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

Hal Hansen
Hydrogeologist/Project Manager

HH:law
Enclosure

cc/enc: Ms. Lisa McCann, California Regional Water Quality Control Board,
San Francisco Bay Region
Ms. Diane Lundquist, Shell Oil Company

PHASE II HYDROGEOLOGIC ASSESSMENT REPORT

3420 SAN PABLO AVENUE

OAKLAND, CALIFORNIA

DELTA PROJECT NO. 40-88-666

WIC NO. 204-5508-5306

Delta
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Consultants, Inc.

PHASE II HYDROGEOLOGIC ASSESSMENT REPORT

3420 SAN PABLO AVENUE

OAKLAND, CALIFORNIA

DELTA PROJECT NO. 40-88-666

WIC NO. 204-5508-5306

Prepared by:

Delta Environmental Consultants, Inc.
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June 26, 1990

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DELTA PROJECT NO. 40-88-666
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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.

- 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.

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.

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	1S-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

[a]Locations 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 Number	Sample Depth (ft)	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	EDB[a]	EDC[b]	TPH[c]	Total Lead
B-1-1[d]	5-5.5	08/08/88	1.90	42.00	43.00	120.00	NA[d]	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:
[a]Ethylene dibromide.
[b]1,2-dichloroethane.
[c]Total petroleum hydrocarbons as gasoline.
[d]Soil samples collected by Ensco Environmental Services, Inc.
[e]Not analyzed.
[f]Not detected.
[g]Soil samples collected by Delta Environmental Consultants, Inc.

TABLE 2-Continued

Soil Chemical Analysis
Concentrations in parts per million (ppm)

Sample Number	Sample Depth (ft)	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	EDB[a]	EDC[b]	TPH[c]	Total Lead
MW-1-1[g]	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[g]	5.5-6	01/19/90	ND	ND	ND	ND	NA	NA	ND	NA
MW-7-1[g]	5.5-6	01/19/90	0.078	ND	0.21	ND	NA	NA	14	NA
MW-8-1[g]	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:
[a]Ethylene dibromide.
[b]1,2-dichloroethane.
[c]Total petroleum hydrocarbons as gasoline.
[d]Soil samples collected by Ensco Environmental Services, Inc.
[e]Not analyzed.
[f]Not detected.
[g]Soil samples collected by Delta Environmental Consultants, Inc.

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 Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	EDB[a]	EDC[b]	TPH[c]
MW-1	04/17/89	1,400	2,300	6,600	1,100	ND[d]	10.0	12,000
	01/23/90	NA[e]	NA	NA	NA	NA	NA	NA
MW-2	04/17/89	12,000	1,800	12,000	2,200	<100	36.0	35,000
	01/23/90	110	9.6	140	3,300	NA	NA	40,000
MW-3	04/17/89	3.0	2.0	9.0	1.0	<1.0	<1.0	100
	01/23/90	1.1	<0.3	<0.3	<0.3	NA	NA	140
MW-4	04/17/89	1.2	<1.0	3.0	<1.0	<0.1	1.5	500
	01/23/90	1.2	<0.3	<0.3	<0.3	NA	NA	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

[a]Ethylene dibromide.
[b]1,2-dichloroethene.
[c]Total petroleum hydrocarbons.
[d]Not detected.
[e]Not analyzed.

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.

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.

TABLE 4

Ground Water Elevations

Monitoring Well	Date	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	---
	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	---
	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	---
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

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.

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.

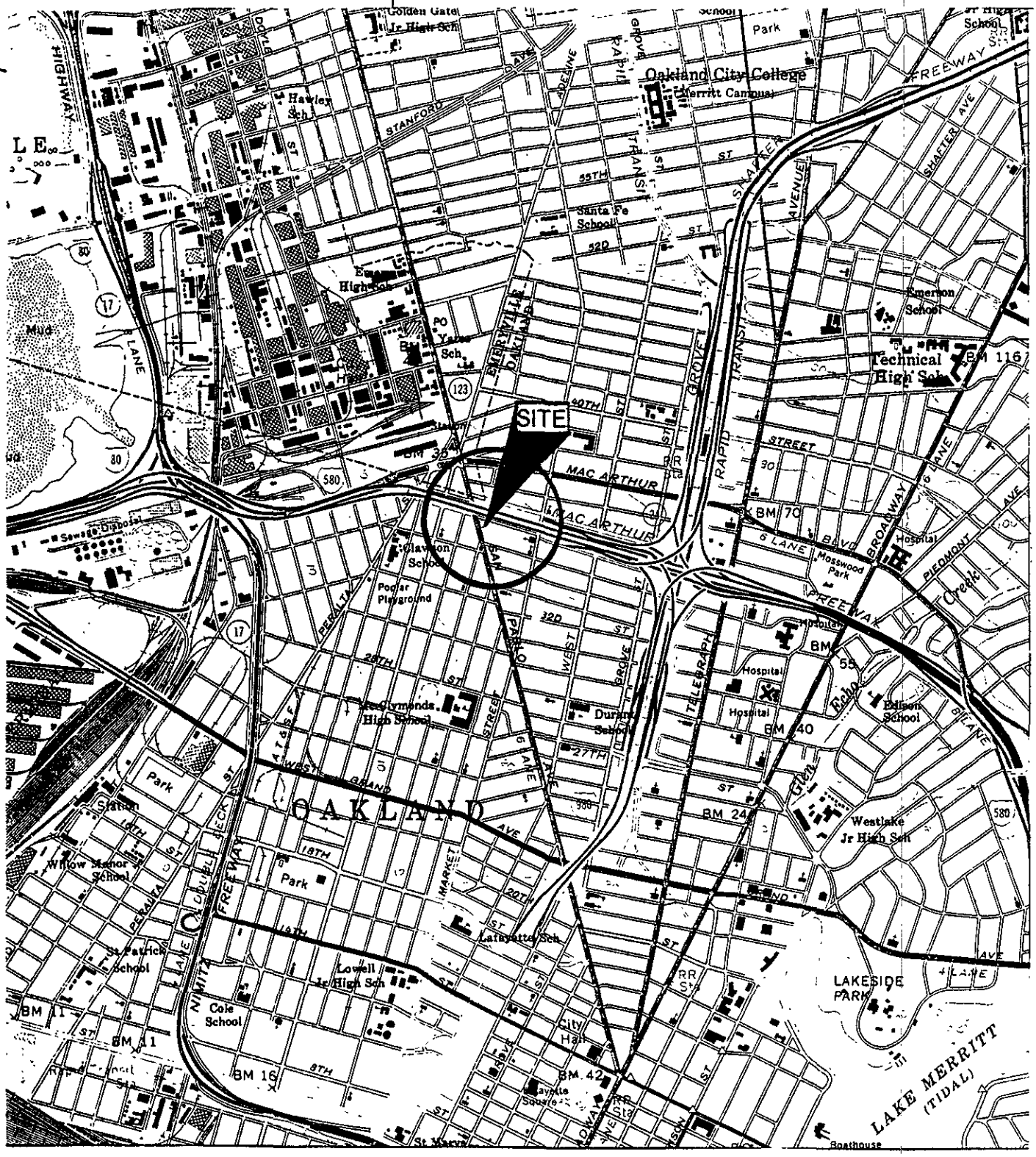
This report was prepared by: Hal Hansen Date 6-22-90
Hal Hansen
Hydrogeologist/Project Manager

This report was reviewed by: Erin Dougherty Date 6-22-90
Erin Dougherty
Geologist

The work performed in this report was done under the supervision of a California Registered Geologist: Dale A. van Dam Date 6/25/90
Dale A. van Dam, R.G.
California Registered
Geologist #4632

REGISTERED GEOLOGIST
DALE A. VAN DAM
NO. 4632
STATE OF CALIFORNIA

/law



GENERAL NOTES:

BASE MAP FROM U.S.G.S.
OAKLAND WEST, CA.
7.5 MINUTE TOPOGRAPHIC
SCALE 1 : 24,000'

QUADRANGLE LOCATION

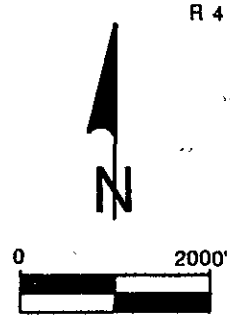


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FIGURE 1
SITE LOCATION MAP
3420 SAN PABLO AVENUE
OAKLAND, CA.

	DRAWN BY: 1-6-89
JOB NO. 40-88-666	CHK BY:

120866

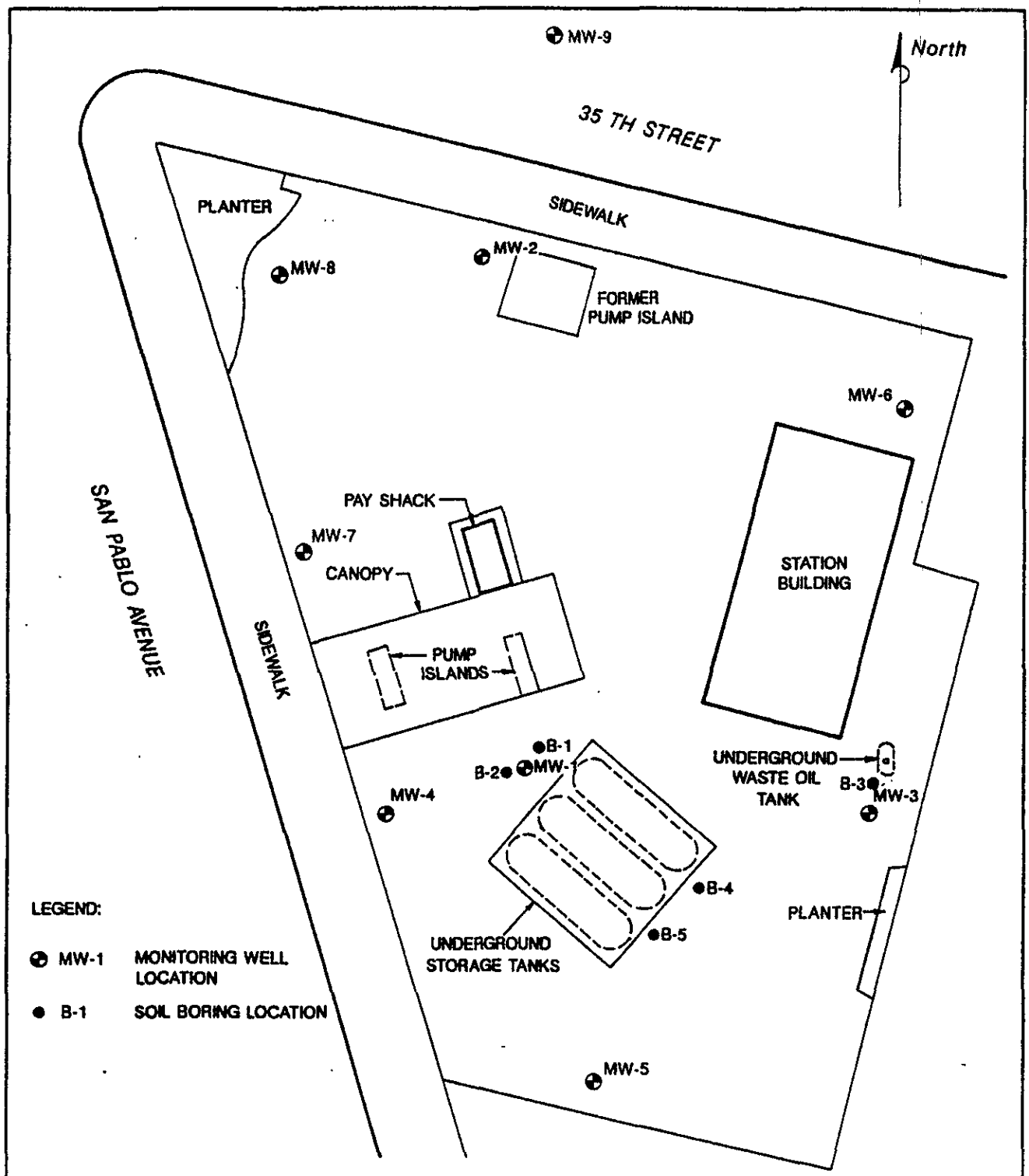


FIGURE 2

SITE MAP

3420 SAN PABLO AVENUE

OAKLAND, CA.

PROJECT NO.	PREPARED BY
40-88-666	HEH 2/7/90
AUTOCAD NO.	REVIEWED BY
—	

Delta Environmental Consultants, Inc.

APPOXIMATE WELL LOCATIONS

Domestic Well Inventory

Well Property Owner	Well Use
1. PG&E	Industrial
2. PG&E	Industrial
3. Arco	Monitoring
4. Sherwin Williams Co.	Industrial
5. Presto-Lite Co.	Industrial
6. AC Transit	Industrial
7. City of Emeryville	Municipal
8. Del Monte Corp.	Monitoring
9. PG&E	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. PG&E	Industrial
27. Chevron	Monitoring
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'

CAL.F

QUADRANGLE LOCATION

N

0 1.650'

SCALE
(APPROXIMATE)

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	CHK BY

120866

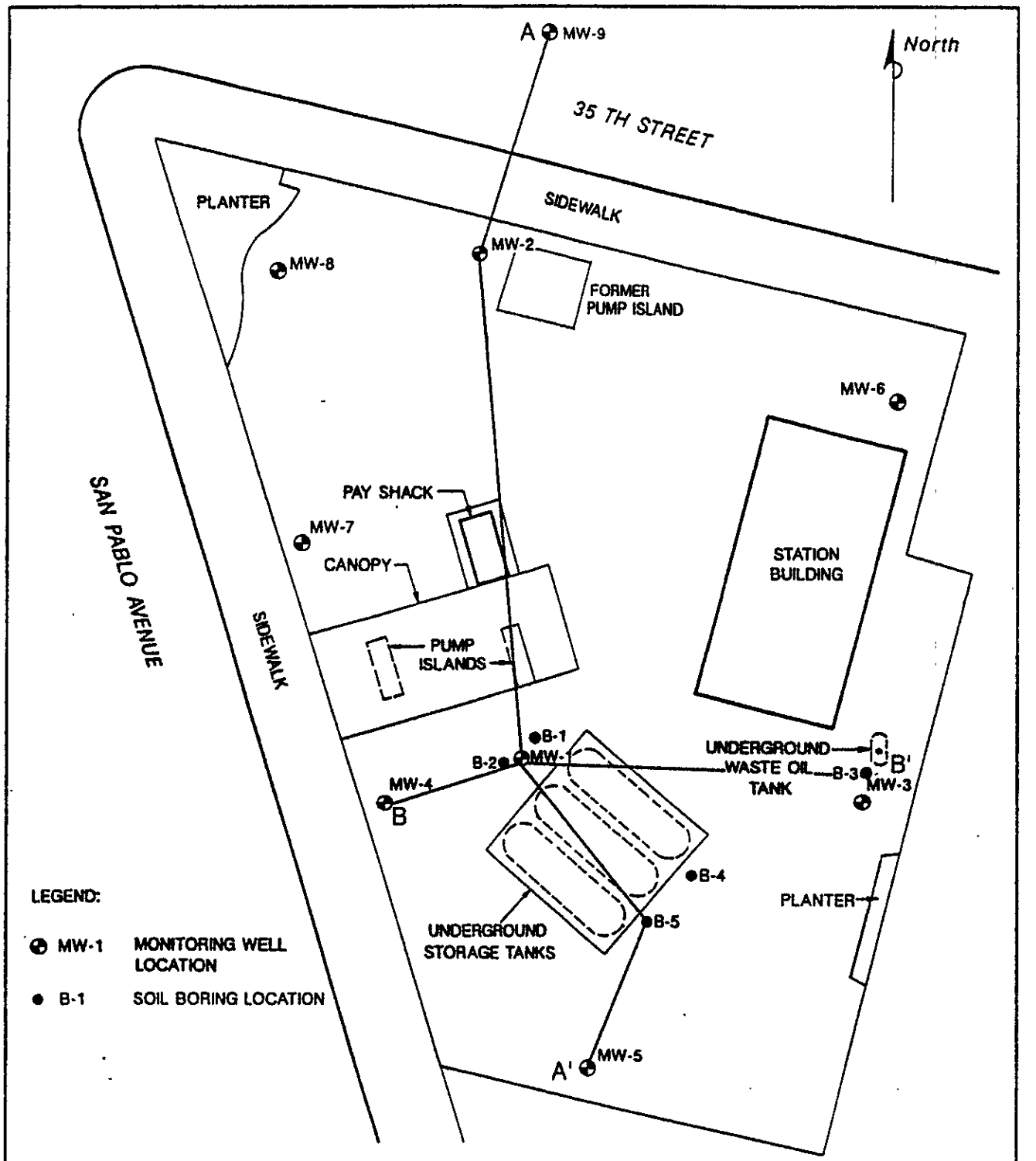


FIGURE 4

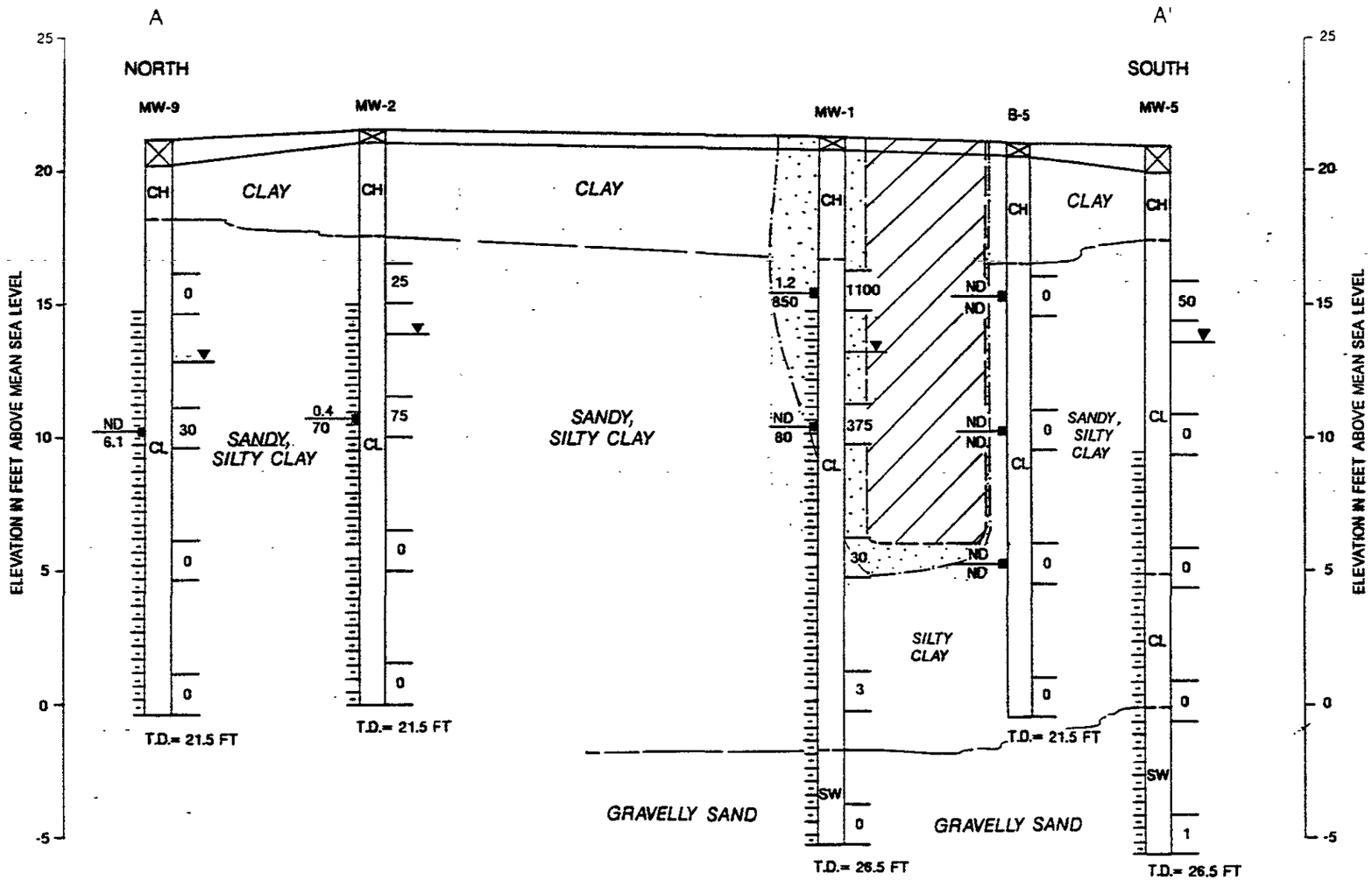
GEOLOGICAL CROSS SECTION LOCATION MAP

3420 SAN PABLO AVENUE

OAKLAND, CA.

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

Delta Environmental Consultants, Inc.



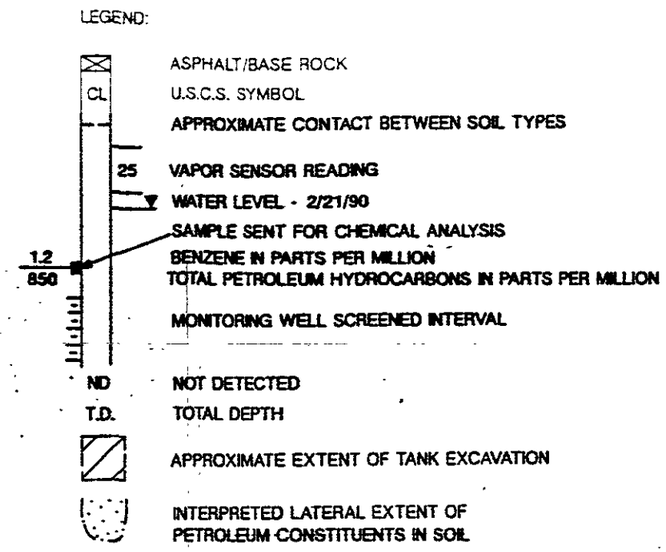


FIGURE 5.

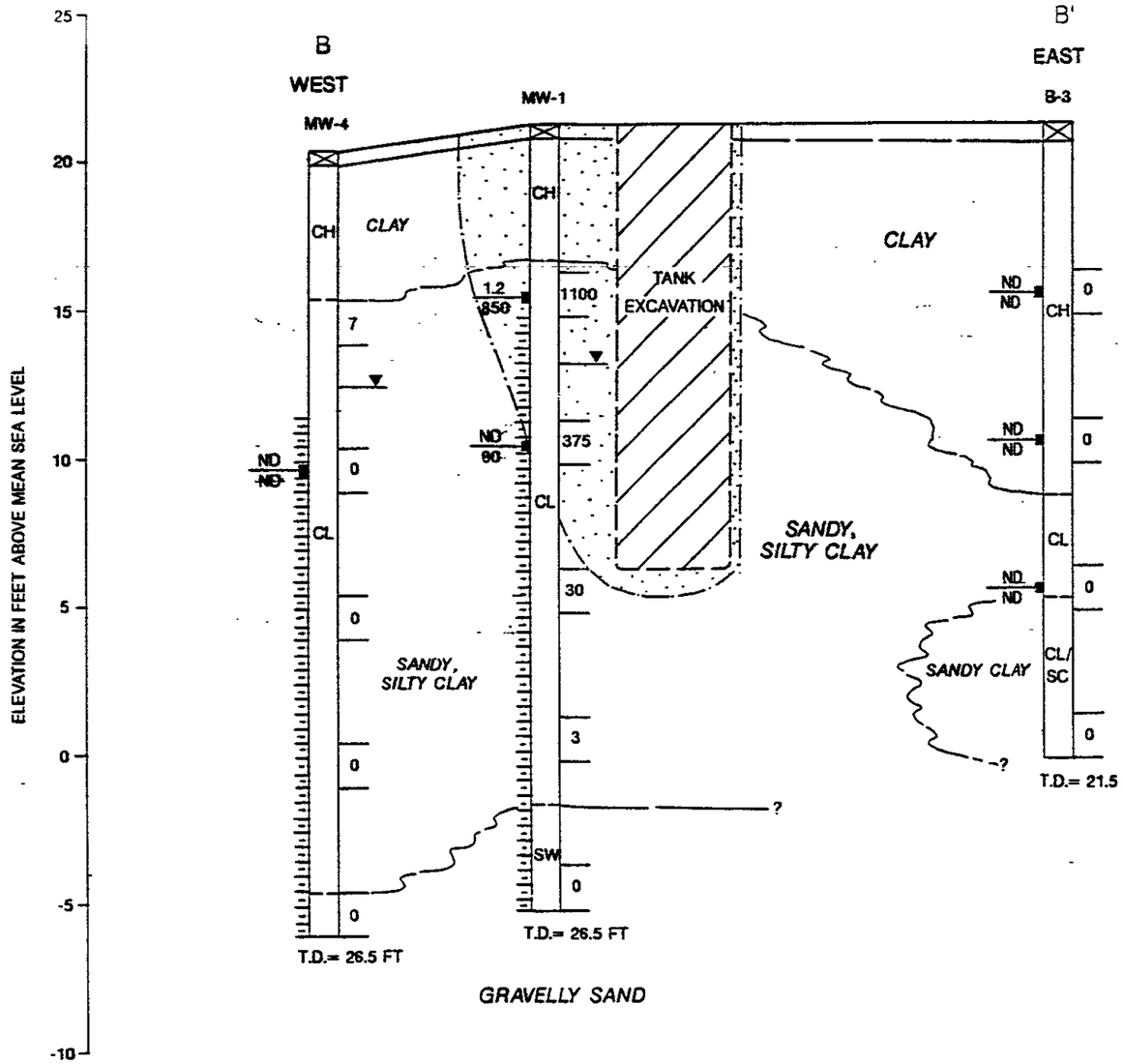
CROSS SECTION A - A'

3420 SAN PABLO AVENUE

OAKLAND, CA.

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

Delta Environmental Consultants, Inc.



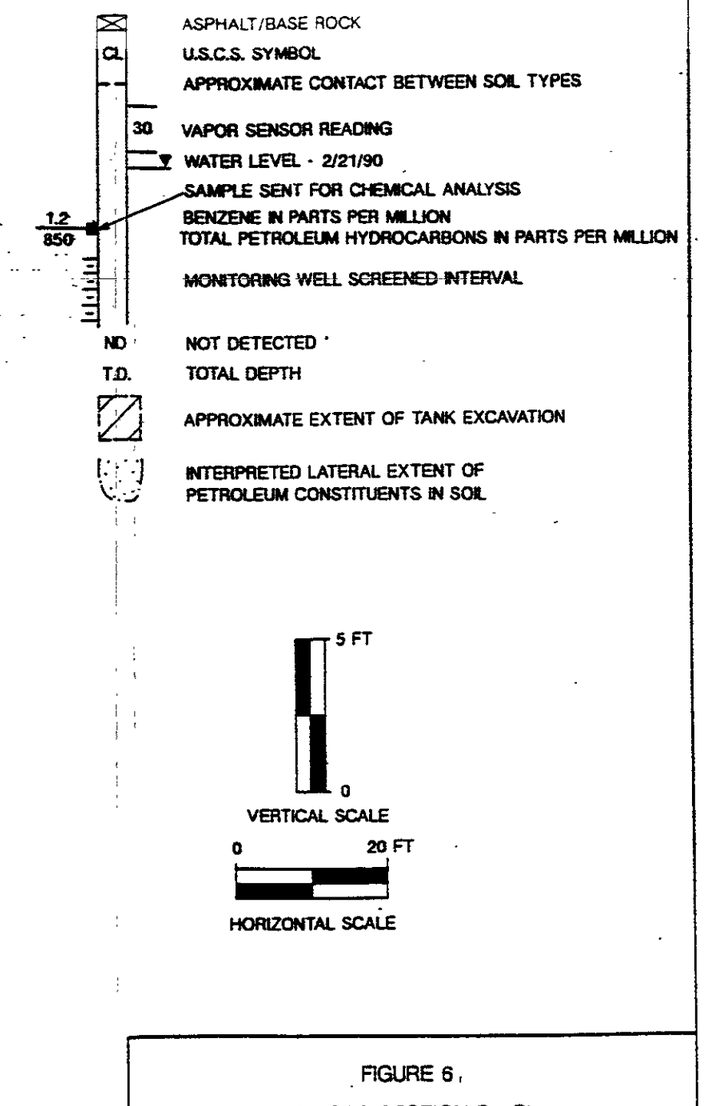


FIGURE 6

CROSS SECTION B - B'

3420 SAN PABLO AVENUE

OAKLAND, CA.

PROJECT NO.	PREPARED BY
40-88-666	HEH 5/7/90
AUTOCAD NO.	REVISED BY
—	

Delta Environmental Consultants, Inc.

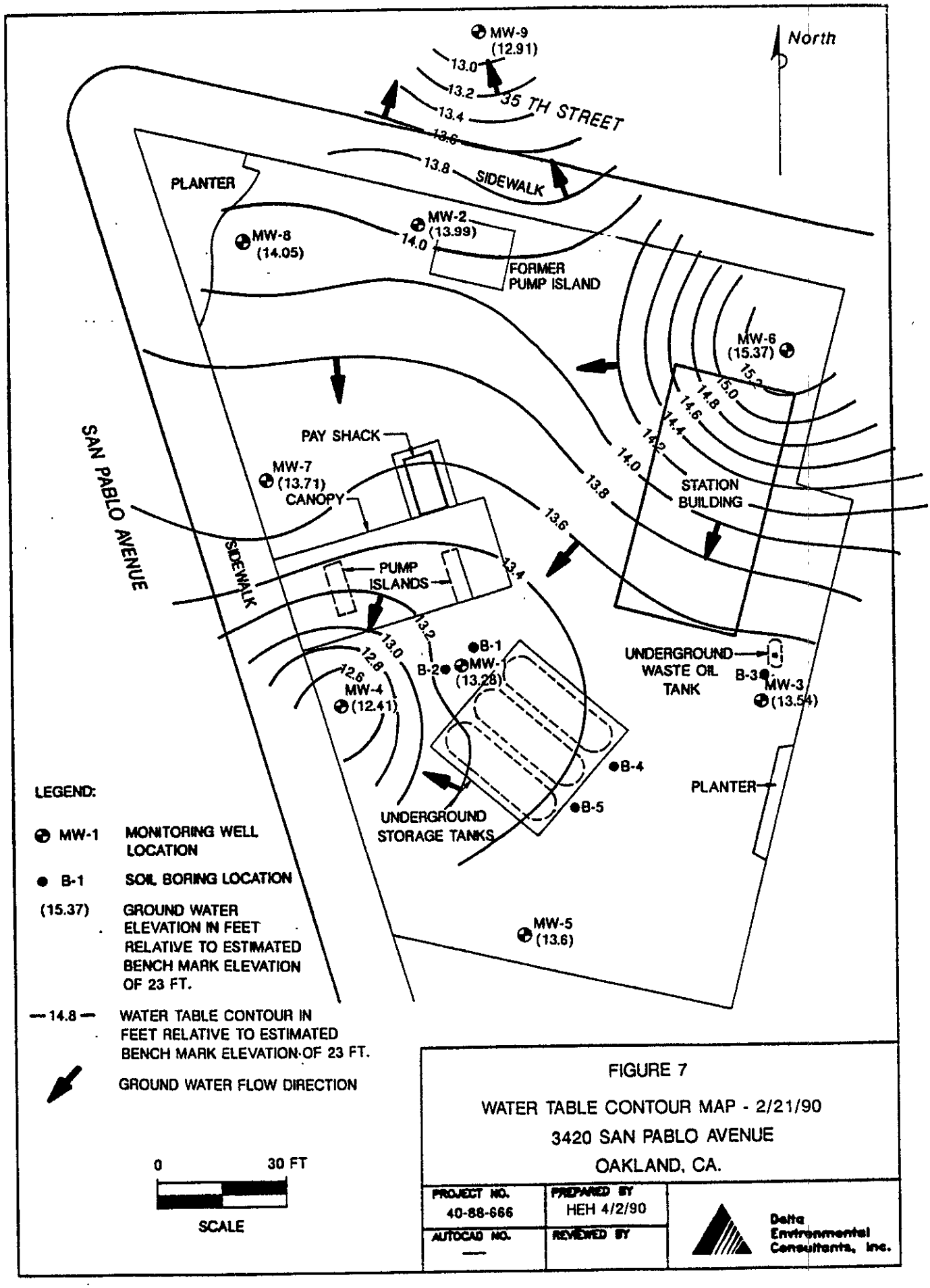


FIGURE 7

WATER TABLE CONTOUR MAP - 2/21/90

3420 SAN PABLO AVENUE

OAKLAND, CA.

PROJECT NO.	PREPARED BY
40-88-666	HEH 4/2/90
AUTOCAD NO.	REVIEWED BY
—	

Delta Environmental Consultants, Inc.

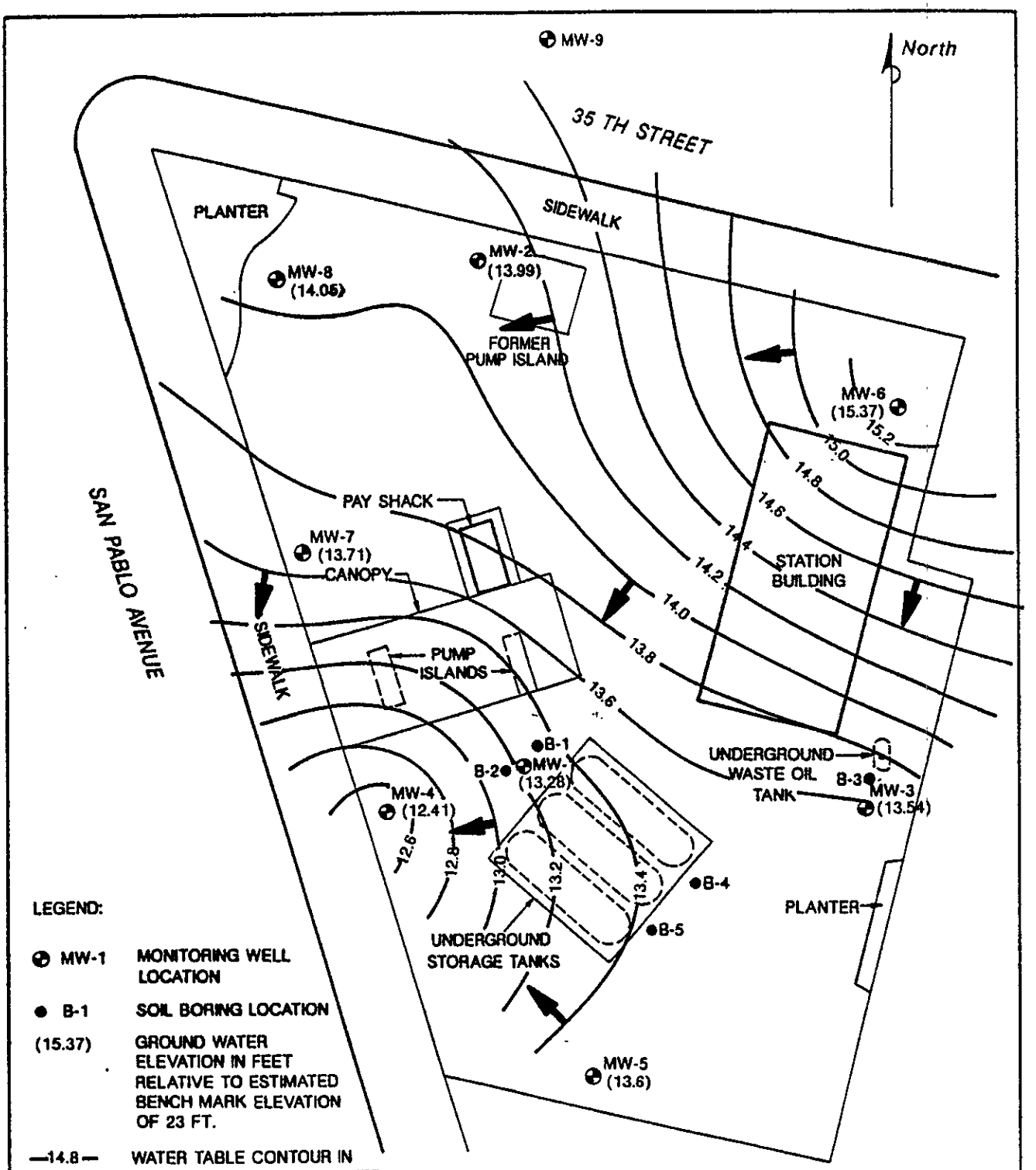


FIGURE 8
WATER TABLE CONTOUR MAP - 2/21/90
EXCLUDING MW-9
3420 SAN PABLO AVENUE
OAKLAND, CA.

PROJECT NO.	PREPARED BY
40-88-666	HEH 4/2/90
AUTOCAD NO.	REVIEWED BY
—	

Delta Environmental Consultants, Inc.

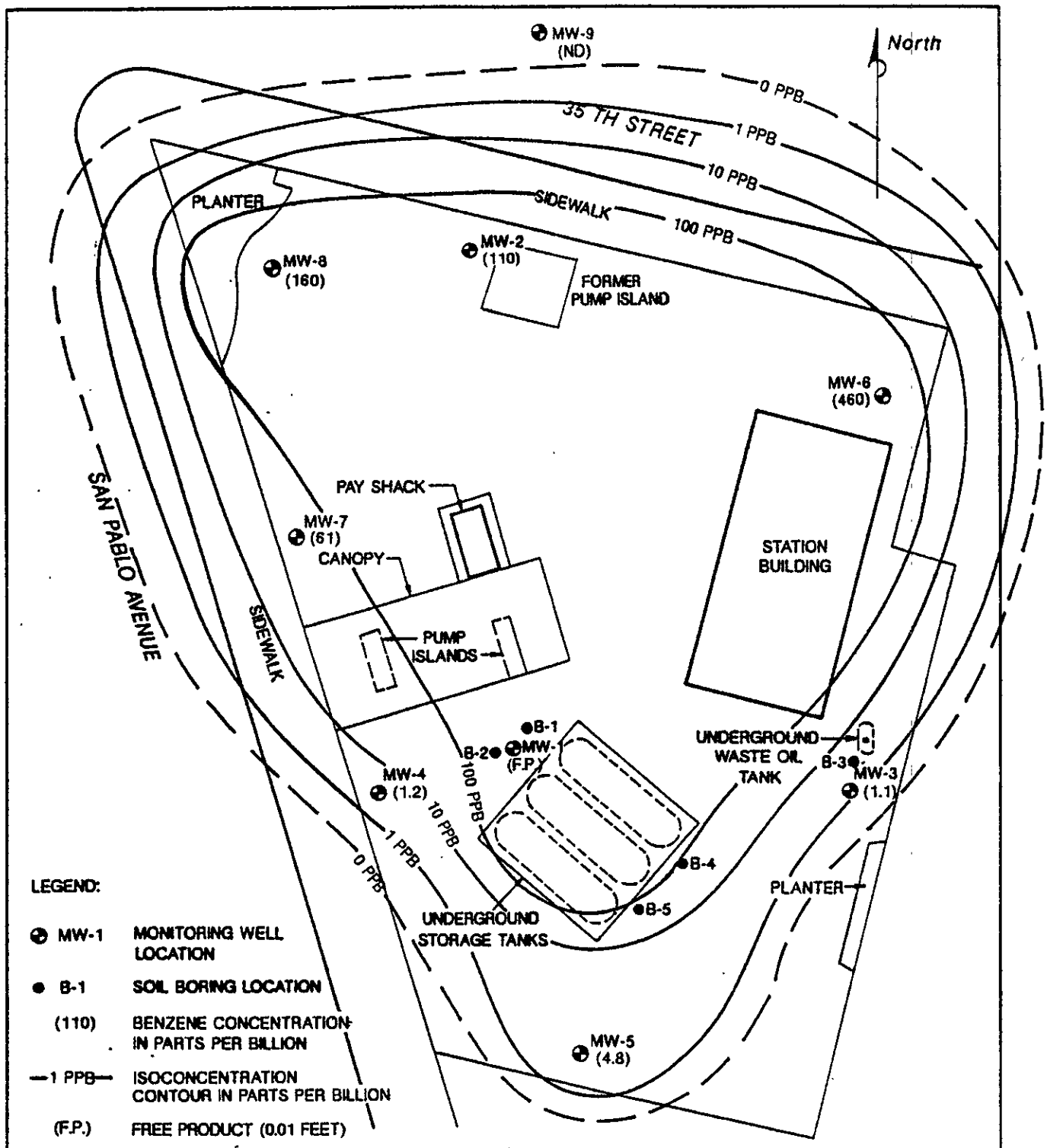


FIGURE 9

BENZENE ISOCONCENTRATION MAP

3420 SAN PABLO AVENUE

OAKLAND, CA.

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

Delta Environmental Consultants, Inc.

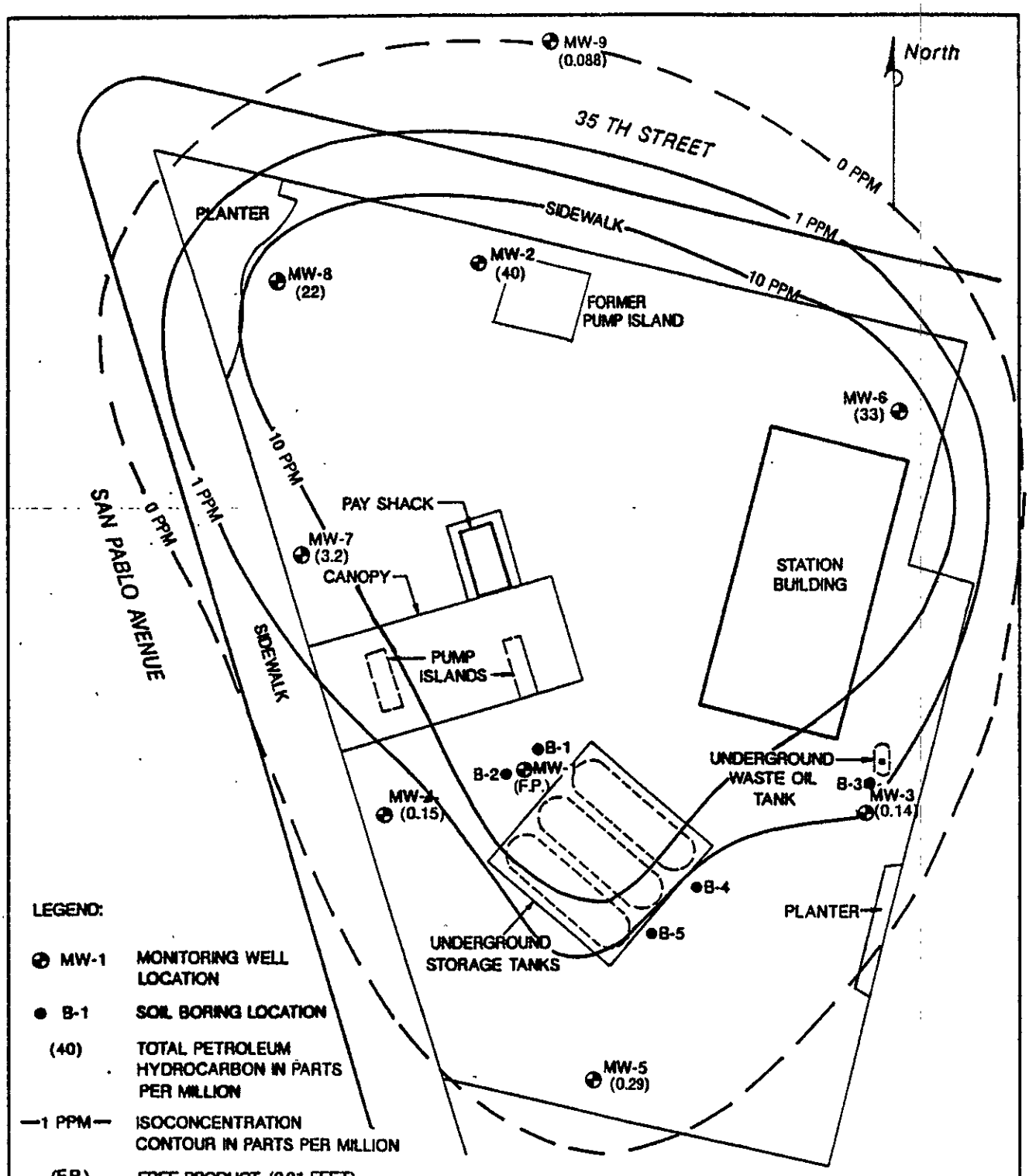


FIGURE 10

TPH ISOCONCENTRATION MAP

3420 SAN PABLO AVENUE

OAKLAND, CA.

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

Delta Environmental Consultants, Inc.

APPENDIX A

Soil Boring Logs

PROJECT NAME / LOCATION	PROJECT NUMBER: 40-88-666	BORING NUMBER: MW-5	SHEET 1 OF 2
Oakland Shell 3420 San Pablo Avenue Oakland, CA	CONTRACTOR: West Hazmat Drilling		DRILLING METHOD: H.S.A.
	DRILLER: Randy Reidhead		DRILLING RIG: CME-75
	START: 12:15/01-19-90		COMPLETED: 2:40/01-19-90
LAND OWNER: Shell Oil Company	SURFACE ELEVATION: 20.91		LOGGED BY: Hal Hansen

SAMPLE	TYPE	SAMPLE NUMBER	BLOW COUNTS	SAMPLE INTERVAL (ft)	SAMPLE RECOV (in)	DEPTH SCALE 1"= 4'	DESCRIPTIONS OF MATERIALS AND CONDITIONS	CONTAMINANT OBSERVATION / INSTRUMENT: OVM UNITS: ppm	GENERAL OBSERVATION NOTES
						1	Asphalt road base		
						2	CLAY; very dark gray, highly plastic, slightly moist (CH)		
						3			
						4			
CA		MW-5-1	9/12/38	5.0-6.5	18	5	SANDY CLAY; yellowish brown, moderately plastic, slightly moist (CL)	50	Slight odor
						6			
						7			
						8			
						9			
CA		MW-5-2	12/16/9	10.0-11.5	18	10	Saturated	0	No odor
						11			
						12			
						13			
						14			
CA		MW-5-3	5/7/11	15.0-16.5	18	15		0	No odor
						16	SILTY CLAY; dark yellowish brown, moderately plastic, saturated (CL)		
						17			
						18			
						19			
CA		MW-5-4	4/4/7	20.0-21.5	18	20		0	No odor
						21			
						22			
						23			

WATER LEVEL DATA			
DATE	02-02		
TIME	2:40		
GWL	7.89		
CASING DEPTH	25'		

GEOLOGIST

Hal Hansen

SIGNATURE

Hal Hansen

TYPED NAME

PROJECT NAME / LOCATION	PROJECT NUMBER: 40-88-666	BORING NUMBER: MW-5	SHEET 2 OF 2
Oakland Shell 3420 San Pablo Avenue Oakland, CA	CONTRACTOR: West Hazmat Drilling		DRILLING METHOD: H.S.A.
	DRILLER: Randy Reidhead		DRILLING RIG: CME-75
	START: 12:15/01-19-90		COMPLETED: 2:40/01-19-90
LAND OWNER: Shell Oil Company	SURFACE ELEVATION: 20.91		LOGGED BY: Hal Hansen

SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	SAMPLE INT (ft)	SAMPLE RECOV (in)	DEPTH SCALE 1"= 4'	DESCRIPTIONS OF MATERIALS AND CONDITIONS	CONTAMINANT OBSERVATION / INSTRUMENT: OVM UNITS: ppm	GENERAL OBSERVATION NOTES
CA	MW-5-5	26/47/50 for 4"	25.0-26.5	12	25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47	GRAVELLY SAND; brown, course sand, saturated, minor plastic fines (SW) Total Depth at 26.5 feet	1	No odor

WATER LEVEL DATA			
DATE	02-02		
TIME	2:40		
GWL	7.89		
CASING DEPTH	25'		

GEOLOGIST

Hal Hansen

SIGNATURE

Hal Hansen

TYPED NAME

PROJECT NAME / LOCATION	PROJECT NUMBER: 40-88-666	BORING NUMBER: MW-6	SHEET 1 OF 1
Oakland Shell 3420 San Pablo Avenue Oakland, CA	CONTRACTOR: West Hazmat Drilling		DRILLING METHOD: H.S.A.
	DRILLER: Randy Reidhead		DRILLING RIG: CME-75
	START: 9:00/01-19-90		COMPLETED: 1:00/01-19-90
LAND OWNER: Shell Oil Company	SURFACE ELEVATION: 22.32		LOGGED BY: Hal Hansen

SAMPLE	SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	SAMPLE INT (ft)	SAMPLE REC (in)	DEPTH SCALE 1"= 4'	DESCRIPTIONS OF MATERIALS AND CONDITIONS	CONTAMINANT OBSERVATION INSTRUMENT: OVM UNITS: ppm	GENERAL OBSERVATION NOTES
						1	Asphalt road base		
						2	CLAY; very dark gray, highly plastic, slightly moist (CH)		
						3			
						4			
CA	MW-6-1	10/12/38	5.0-6.5	18		5	SANDY CLAY; greenish gray, moderately plastic, slightly moist (CL)	0	No odor
						6			
						7			
						8			
						9			
CA	MW-6-2	9/13/20	10.0-11.5	18		10	Color change to yellowish brown	14	Slight odor
						11			
						12			
						13	Saturated		
						14			
CA	MW-6-3	5/8/11	15.0-16.5	18		15	SILTY CLAY; yellowish brown, moderately plastic, saturated (CL)	0	No odor
						16			
						17			
						18			
						19			
CA	MW-6-4	4/7/11	20.0-21.5	18		20	Total Depth at 21.5 feet	0	No odor
						21			
						22			
						23			

WATER LEVEL DATA			
DATE	02-02		
TIME	11:41		
GWL	7.86		
CASING DEPTH	20'		

GEOLOGIST
Hal Hansen
SIGNATURE
Hal Hansen
TYPED NAME

PROJECT NAME / LOCATION	PROJECT NUMBER: 40-88-666	BORING NUMBER: MW-7	SHEET 1 OF 1
Oakland Shell 3420 San Pablo Avenue Oakland, CA	CONTRACTOR: West Hazmat Drilling	DRILLING METHOD: H.S.A.	
	DRILLER: Randy Reidhead	DRILLING RIG: CME-75	
	START: 11:00/01-19-90	COMPLETED: 12:00/01-19-90	
LAND OWNER: Shell Oil Company	SURFACE ELEVATION: 20.36	LOGGED BY: Hal Hansen	

SAMPLE TYPE	SAMPLER NUMBER	BLOW COUNTS	SAMPLE INT (ft)	SAMPLE REC (in)	DEPTH SCALE 1"= 4'	DESCRIPTIONS OF MATERIALS AND CONDITIONS	CONTAMINANT OBSERVATION INSTRUMENT: OVM UNITS: ppm	GENERAL OBSERVATION NOTES
					1	Asphalt road base		
					2	CLAY; very dark gray, highly plastic, slightly moist (CH)		
					3			
					4			
CA	MW-7-1	16/22/30	5.0-6.5	18	5	SANDY CLAY; greenish gray, moderately plastic, slightly moist (CL)	95	Moderate odor
					6			
					7			
					8			
					9			
CA	MW-7-2	9/15/25	10.0-11.5	18	10	Color change to yellowish brown	85	Moderate odor
					11	Saturated		
					12			
					13			
					14			
CA	MW-7-3	6/8/10	15.0-16.5	18	15		5	Slight odor
					16	SILTY CLAY; yellowish brown, moderately plastic, saturated (CL)		
					17			
					18			
					19			
CA	MW-7-4	6/8/14	20.0-21.5	18	20		0	No odor
					21			
					22	Total Depth at 21.5 feet		
					23			

WATER LEVEL DATA			
DATE	02-02		
TIME	11:52		
GWL	8.91		
CASING DEPTH	20'		

GEOLOGIST
Hal Hansen
SIGNATURE
Hal Hansen
TYPED NAME

PROJECT NAME / LOCATION	PROJECT NUMBER: 40-88-666	BORING NUMBER: MW-8	SHEET 1 OF 1
Oakland Shell 3420 San Pablo Avenue Oakland, CA	CONTRACTOR: West Hazmat Drilling	DRILLING METHOD: H.S.A.	
	DRILLER: Randy Reidhead	DRILLING RIG: CME-75	
	START: 2:30/01-18-90	COMPLETED: 3:45/01-18-90	
LAND OWNER: Shell Oil Company	SURFACE ELEVATION: 20.95	LOGGED BY: Hal Hansen	

SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	SAMPLE INT (ft)	SAMPLE RECOV (in)	DEPTH SCALE 1"= 4'	DESCRIPTIONS OF MATERIALS AND CONDITIONS	CONTAMINANT OBSERVATION INSTRUMENT: OVM UNITS: ppm	GENERAL OBSERVATION NOTES
					1	Asphalt road base		
					2	CLAY; very dark gray, highly plastic, slightly moist (CH)		
					3			
					4			
CA	MW-8-1	16/27/28	5.0-6.5	18	5		3	Slight odor
					6	SANDY CLAY; greenish gray, moderately plastic, slightly moist (CL)		
					7			
					8			
					9			
CA	MW-8-2	11/13/19	10.0-11.5	18	10	Saturated	100	Moderate odor
					11			
					12			
					13			
					14			
CA	MW-8-3	4/6/7	15.0-16.5	18	15		0	No odor
					16			
					17	SILTY CLAY; dark yellowish brown, slightly plastic, saturated (CL)		
					18			
					19			
CA	MW-8-4	9/11/16	20.0-21.5	18	20		0	No odor
					21			
					22	Total Depth at 21.5 feet		
					23			

WATER LEVEL DATA			
DATE	02-02		
TIME	11:49		
GWL	7.32		
CASING DEPTH	20'		

GEOLOGIST
Hal Hansen
SIGNATURE
Hal Hansen
TYPED NAME

PROJECT NAME / LOCATION	PROJECT NUMBER: 40-88-666	BORING NUMBER: MW-9	SHEET 1 OF 1
Oakland Shell 3420 San Pablo Avenue Oakland, CA	CONTRACTOR: West Hazmat Drilling		DRILLING METHOD: H.S.A.
	DRILLER: Randy Reidhead		DRILLING RIG: CME-75
	START: 12:30/01-19-90		COMPLETED: 2:00/01-19-90
LAND OWNER: Shell Oil Company	SURFACE ELEVATION: 21.19		LOGGED BY: Hal Hansen

SAMPLE TYPE	SAMPLE NUMBER	BLOW COUNTS	SAMPLE INT (ft)	SAMPLE RECOV (in)	DEPTH SCALE 1"= 4'	DESCRIPTIONS OF MATERIALS AND CONDITIONS	CONTAMINANT OBSERVATION INSTRUMENT: OVM UNITS: ppm	GENERAL OBSERVATION NOTES
					1	Asphalt road base		
					2	CLAY; very dark gray, highly plastic, slighly moist (CH)		
					3			
					4			
CA	MW-9-1	9/23/27	5.0-6.5	10	5	SANDY CLAY; yellowish brown, moderately plastic, slightly moist (CL)	0	No odor
					6			
					7			
					8			
					9			
CA	MW-9-2	16/21/31	10.0-11.5	18	10		30	Slight odor
					11			
					12			
					13			
					14			
CA	MW-9-3	5/9/12	15.0-16.5	18	15	SILTY CLAY; dark yellowish brown, slightly plastic saturated (CL)	0	No odor
					16			
					17			
					18			
					19			
CA	MW-9-4		20.0-21.5	18	20		0	No odor
					21			
					22	Total Depth at 21.5 feet		
					23			

WATER LEVEL DATA			
DATE	02-02		
TIME	11:43		
GWL	9.02		
CASING DEPTH	20'		

GEOLOGIST
Hal Hansen
SIGNATURE
Hal Hansen
TYPED NAME

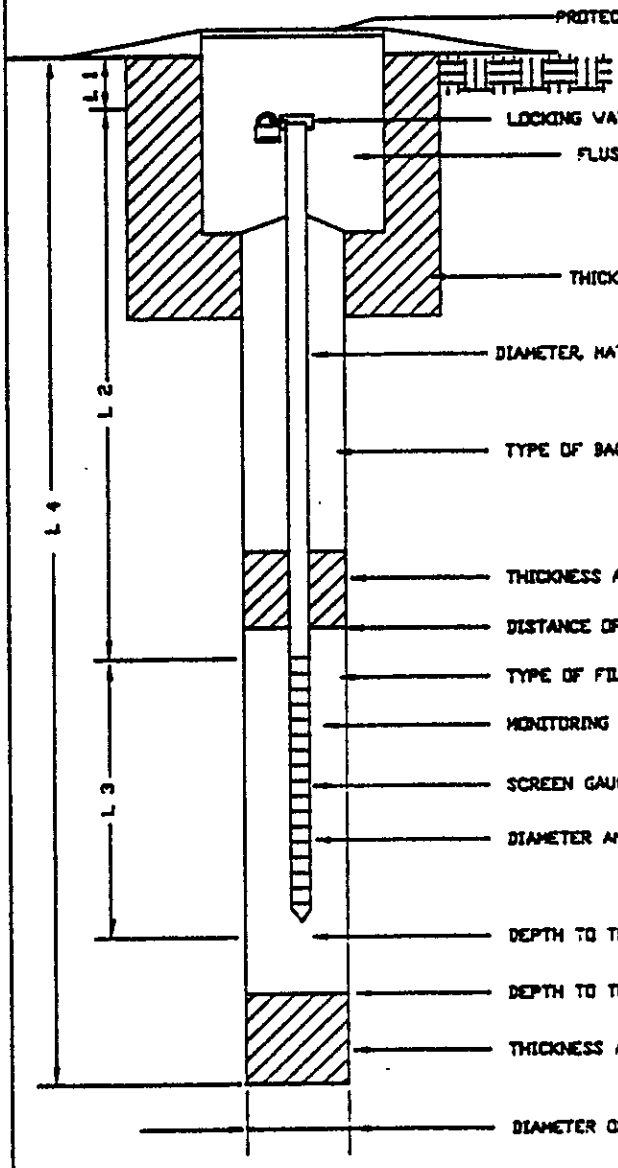
APPENDIX B

Monitoring Well Construction Details

INSTALLATION OF FLUSH GRADE MONITORING WELL

PROJECT: Oakland Shell
3420 San Pablo Ave
DELTA NO. 40-88-666

MONITORING WELL NO. MW-5
ELEVATIONS: TOP OF RISER 20.91
GROUND LEVEL 21.29



FLUSH GRADE WELL CONSTRUCTION DIAMETER AND MATERIAL	12 inch steel
TOTAL LENGTH	9 inches
LENGTH ABOVE GROUND	1/4 inch
THICKNESS AND TYPE OF SEAL	1-foot concrete
DIAMETER, MATERIAL AND JOINT TYPE OF RISER PIPE	4 inch PVC, flush thread
TYPE OF BACKFILL AROUND RISER	sand cement
THICKNESS AND TYPE OF SEAL	1 foot bentonite
DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN	1 foot
TYPE OF FILTER AROUND SCREEN	#3 clemintine
MONITORING WELL MATERIAL	sch 40, PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE)	0.01 inch
DIAMETER AND LENGTH OF SCREEN	4 inch 20 feet
DEPTH TO THE BOTTOM OF MONITORING WELL	25 feet
DEPTH TO THE BOTTOM OF FILTER SAND	25 feet
THICKNESS AND TYPE OF SEAL	N/A
DIAMETER OF BOREHOLE	10 inches

L 1 = 0.25 FT.
L 2 = 4.75 FT.
L 3 = 20.0 FT.
L 4 = 25.0 FT.

INSTALLATION COMPLETED:
DATE: 1-19-90
TIME: 240

MONITORING WELL WATER LEVEL MEASUREMENTS

DATE	TIME	WATER LEVEL *
2-2-90	11:59	7.89

* MEASURE POINT: Top of casing

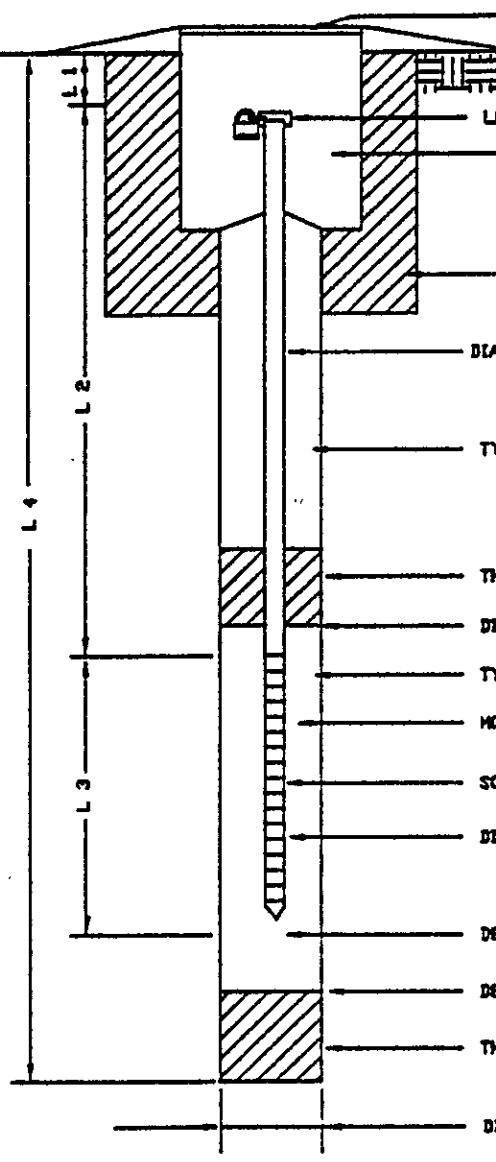
Delta Environmental Consultants, Inc.

1022 B/3-89

INSTALLATION OF FLUSH GRADE MONITORING WELL

PROJECT: Oakland Shell
3420 San Pablo Ave
DELTA NO. 40-88-666

MONITORING WELL NO. MW-6
ELEVATIONS: TOP OF RISER 22.32
GROUND LEVEL 22.63



FLUSH GRADE WELL CONSTRUCTION DIAMETER AND MATERIAL	12 inch steel
TOTAL LENGTH	9 inches
LENGTH ABOVE GROUND	1/4 inch
THICKNESS AND TYPE OF SEAL	1 foot concrete
DIAMETER, MATERIAL AND JOINT TYPE OF RISER PIPE	4 inch, PVC, flush thread
TYPE OF BACKFILL AROUND RISER	sand cement
THICKNESS AND TYPE OF SEAL	1 foot bentonite
DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN	1 foot
TYPE OF FILTER AROUND SCREEN	#3 clemintine
MONITORING WELL MATERIAL	sch 40 PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE)	0.01 inch
DIAMETER AND LENGTH OF SCREEN	4 inch 15 feet
DEPTH TO THE BOTTOM OF MONITORING WELL	20 feet
DEPTH TO THE BOTTOM OF FILTER SAND	20 feet
THICKNESS AND TYPE OF SEAL	N/A
DIAMETER OF BOREHOLE	10 inches

L 1 = 0.25 FT.
L 2 = 4.75 FT.
L 3 = 15.0 FT.
L 4 = 20.0 FT.

INSTALLATION COMPLETED:
DATE: 1-19-90
TIME: 10:00

MONITORING WELL WATER LEVEL MEASUREMENTS

DATE	TIME	WATER LEVEL *
2-2-90	11:41	7.86

* MEASURE POINT: Top of casing

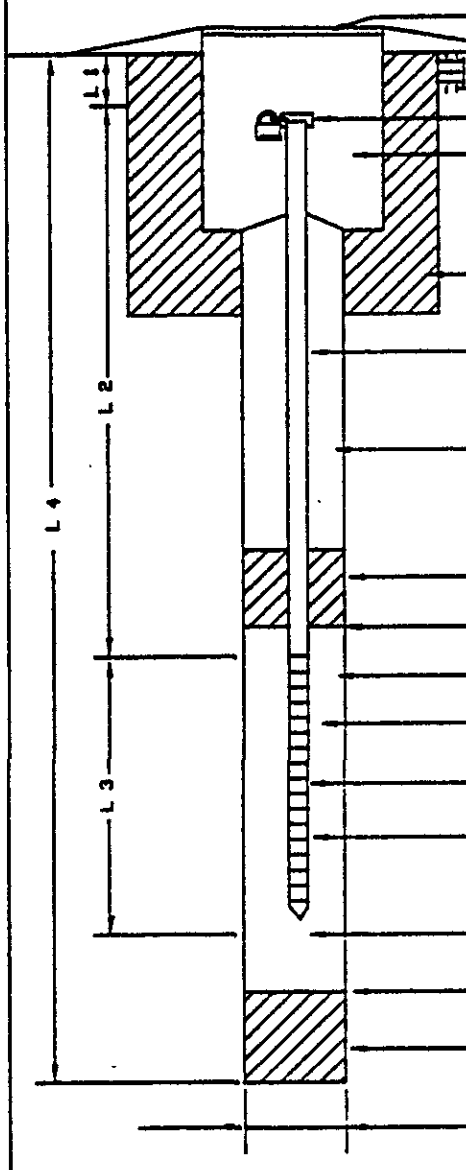
Delta Environmental Consultants, Inc.

1022 B/3-89

INSTALLATION OF FLUSH GRADE MONITORING WELL

PROJECT: Oakland Shell
3420 San Pablo Ave
DELTA NO.: 40-88-666

MONITORING WELL NO.: MW-7
ELEVATIONS: TOP OF RISER 20.36
GROUND LEVEL 20.76



FLUSH GRADE WELL CONSTRUCTION DIAMETER AND MATERIAL	12 inch steel
TOTAL LENGTH	9 inches
LENGTH ABOVE GROUND	1/4 inch
THICKNESS AND TYPE OF SEAL	1 foot concrete
DIAMETER, MATERIAL AND JOINT TYPE OF RISER PIPE	4 inches PVC, flush thread
TYPE OF BACKFILL AROUND RISER	sand cement
THICKNESS AND TYPE OF SEAL	1 foot bentonite
DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN	1 foot
TYPE OF FILTER AROUND SCREEN	#3 clemintine
MONITORING WELL MATERIAL	sch 40 PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE)	0.01 inch
DIAMETER AND LENGTH OF SCREEN	4 inch 15 feet
DEPTH TO THE BOTTOM OF MONITORING WELL	20 feet
DEPTH TO THE BOTTOM OF FILTER SAND	20 feet
THICKNESS AND TYPE OF SEAL	N/A
DIAMETER OF BOREHOLE	10 inches

L 1 = 0.25 FT.
L 2 = 4.75 FT.
L 3 = 15.0 FT.
L 4 = 20.0 FT.

INSTALLATION COMPLETED:
DATE: 1-19-90
TIME: 12:00

MONITORING WELL WATER LEVEL MEASUREMENTS

DATE	TIME	WATER LEVEL *
2-2-90	11:52	8.91

* MEASURE POINT: top of casing

Delta Environmental Consultants, Inc.

1022 B/3-89

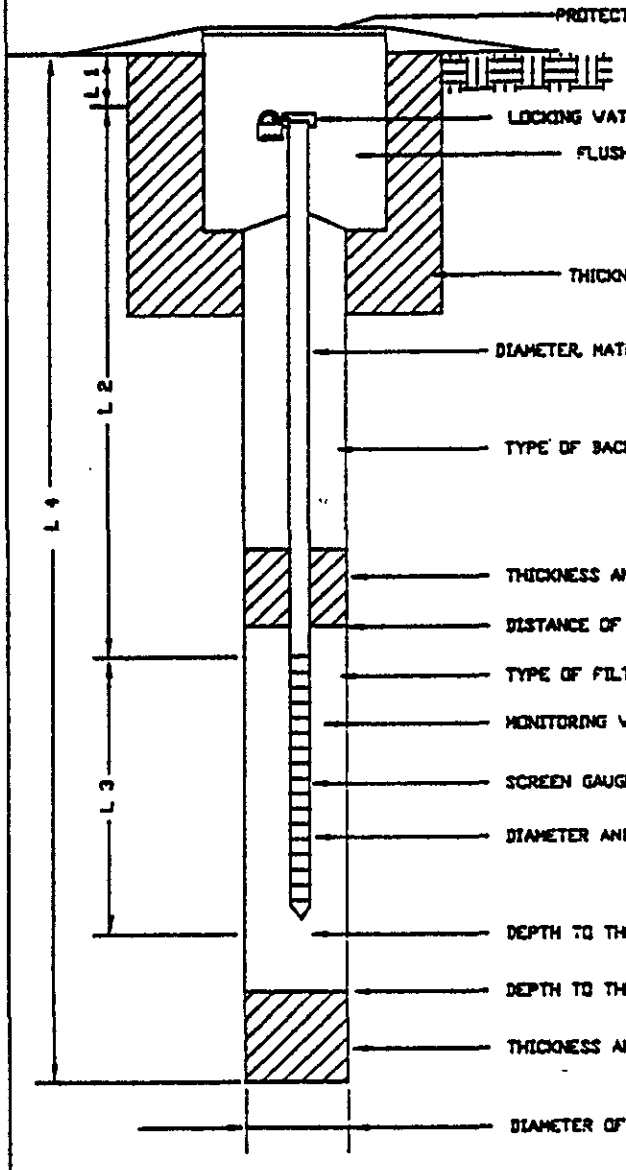
INSTALLATION OF FLUSH GRADE MONITORING WELL

PROJECT: Oakland Shell
3420 San Pablo Ave

DELTA NO.: 40-88-666

MONITORING WELL NO.: MW-8

ELEVATIONS: TOP OF RISER 20.95
GROUND LEVEL 21.14



FLUSH GRADE WELL CONSTRUCTION DIAMETER AND MATERIAL	12 inch steel
TOTAL LENGTH	9 inches
LENGTH ABOVE GROUND	1/4 inch
THICKNESS AND TYPE OF SEAL	1 foot concrete
DIAMETER, MATERIAL AND JOINT TYPE OF RISER PIPE	4 inches PVC, flush thread
TYPE OF BACKFILL AROUND RISER	sand cement
THICKNESS AND TYPE OF SEAL	1 foot bentonite
DISTANCE OF FILTER SAND ABOVE TOP OF SCREEN	1 foot
TYPE OF FILTER AROUND SCREEN	#3 clemintine
MONITORING WELL MATERIAL	sch 40 PVC
SCREEN GAUGE OR SIZE OF OPENINGS (SLOT SIZE)	0.01 inch
DIAMETER AND LENGTH OF SCREEN	4 inch 15 feet
DEPTH TO THE BOTTOM OF MONITORING WELL	20 feet
DEPTH TO THE BOTTOM OF FILTER SAND	20 feet
THICKNESS AND TYPE OF SEAL	N/A
DIAMETER OF BOREHOLE	10 inches

L 1 = 0.25 FT.
L 2 = 4.75 FT.
L 3 = 15.0 FT.
L 4 = 20.0 FT.

INSTALLATION COMPLETED:
DATE: 1-18-90
TIME: 3:45

MONITORING WELL WATER LEVEL MEASUREMENTS

DATE	TIME	WATER LEVEL *
2-2-90	11:49	7.32

* MEASURE POINT: top of casing

Delta Environmental Consultants, Inc.

1022 B/3-89

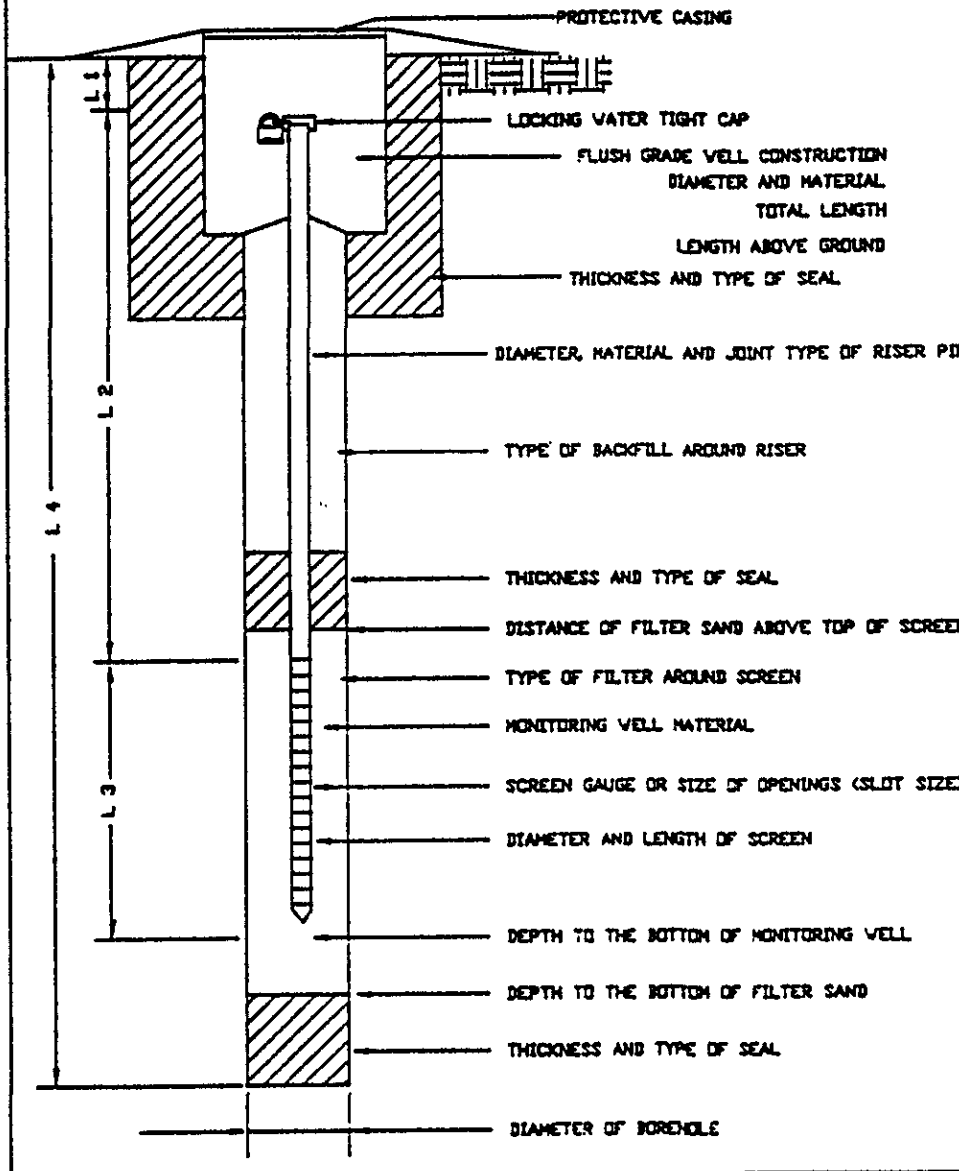
INSTALLATION OF FLUSH GRADE MONITORING WELL

PROJECT: Oakland Shell
3420 San Pablo Ave

DELTA NO.: 40-88-666

MONITORING WELL NO.: MW-9

ELEVATIONS: TOP OF RISER 21.19
GROUND LEVEL 21.46



12-inches, steel	
9 inches	
1/4 inch	
1 foot concrete	
4 inches PVC, flush thread	
sand cement	
1 foot bentonite	
1 foot	
#3 clemintine	
sch 40, PVC	
0.01 inch	
4 inch - 15 feet	
20 feet	
20 feet	
N/A	
10 inches	

L 1 = 0.25 FT.
L 2 = 4.75 FT.
L 3 = 15.0 FT.
L 4 = 20.0 FT.

INSTALLATION COMPLETED:
DATE: 1-18-90
TIME: 2:00

MONITORING WELL WATER LEVEL MEASUREMENTS

DATE	TIME	WATER LEVEL *
2-2-90	11:43	9.02

* MEASURE POINT: top of casing

Delta Environmental Consultants, Inc.

1022 B/3-89

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	Soil, 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

VM Tague

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Delta Environmental Consultants	Client Project ID:	#40-88-66601, Shell, Oakland	Sampled: Jan 18-19, 1990
3330 Data Drive	Matrix Descript:	Soil	Received: Jan 23, 1990
Rancho Cordova, CA 95670	Analysis Method:	EPA 5030/8015/8020	Analyzed: Jan 25-30, 1990
Attention: Hal Hansen	First Sample #:	001-2688	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.	0.14	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.
Detection Limits:		**1.0**	**0.05**	**0.1**	**0.1**	**0.1**

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

DELTA
ENVIRONMENTAL CONSULTANTS, INC.

Project: Oakland Shell
Shipped by: Greyhound
Shipped to: Sequoia Lab
Comments:

W.O. # 40-88-666 01

Attention of:
Hazardous materials suspected? (yes/no)

Sampling Point	Location	Field ID #	Date	Sample Type	No. of Containers	Analysis Required
3420 San Pablo	Oakland	MW-9-2 10'	1-18-90	soil	1	TPH + BTXE w/ 8020
		MW-8-1 5'	1-18-90	soil	1	TPH + BTXE w/ 8020
		MW-7-1 5'	1-19-90	soil	1	TPH + BTXE w/ 8020
		MW-6-1 5'	1-19-90	soil	1	TPH + BTXE w/ 8020
		MW-5-1 5'	1-19-90	soil	1	TPH + BTXE w/ 8020

Sampler(s) (signature) Hal Hansen

Field ID	Relinquished by: (signature)	Received by: (signature)	Date/Time	Comments
	Hal Hansen	Brenda Olin	1-22-90 2:30	1/23 8:30

Sealed for shipment by: (signature) Hal Hansen Date/Time 1-22-90 2:30 Shipment method: greyhound

Received for Lab by: (signature) Date/Time Comments

Receiving Laboratory: Please return original form after signing for receipt 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 Ave (Location)

Oakland, CA

40-88-666.01 (Delta No.)

Delta Project Manager: Hal Hanson

Date of Field Activity: 01-23-90

Delta On-Site Coordinator: Bo Patten

Personnel at Site and Affiliation:

Bo Patten - Delta

Brandon Poteet - Delta

Description of Field Activities:

- collect water samples from all monitoring wells
- collect soil samples from soil stockpile
- survey monitoring wells 5, 6, 7, 8, 9

Brief Summary of Results:

- monitoring well 1 was not sampled because it contained product

If you have any questions, please call me at 612/636-2427.

Sincerely,

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Name: James W Patten

Title: _____

cc: _____

_____

SITE SAMPLING / VISIT CHECKLIST

SITE: Oakland Shell
Oakland, CA

DELTA PROJECT NO: _____

DELTA COMPUTER NO: _____

Date: 01-23-90

Time Arrived at Site: _____
Time Departed from Site: _____

Wells Sampled: MW's 1, 2, 3, 4, 5, 6, 7, 8, 9

Order in Which Wells Were Sampled: MW-2, 8, 6, 9, 7, 4, 3, 5

Date and Time Samples Shipped: 01-24-90 / 900

Carrier Samples Were Shipped By: Greyhound

Parameters to be Sampled For: BTEX, TPH(Gas)

Water Level Data Sheets Attached: Yes ✓ No ___

Sampling Data Sheets Attached: Yes ✓ No ___
Number of Sheets: _____

Chain of Custody Attached: Yes ✓ No ___

Any Problems or Comments: MW-1 was not sample because it contained product. .01'

Delta

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Sampling Information Sheet

Weather Condition:

Cloud Cover: NONE

Wind Speed: ZERO

Temperature: 60

Sampling point: MW-2 Project:

Location: OAKLAND W.O. #: 40-88-666.01

Sample ID#: mw-2/01239/11:15 Date sampled: 01/23/96 Time: 11:15 AM / PM

Describe sampling point: well located on site between mw-8 + mw-6 parrellel to 35th St.

Well depth: 19.20 ft. below MP Casing diameter: inches

Depth to water (below MP) 8.30 ft. Date: 01/23/96 Time: 10:50 AM / PM

Discharge rate = gpm x 0.00223 = cfs.

At least 3 well ~~bore~~ volumes have been evacuated before sampling.

Sampling method: ____ Tap ____ Submersible pump X Bailer ____ Other:

Pump intake or bailer set at ft. below MP

Tubing (type:), (new or previously used) was used to collect all samples (___yes ___no)

and all ffield measurements (___Yes ___no). Tubing used only for:

Sample appearance: Silty brown Odor: NONE

Note any sampling problems:

Note any cleaning performed in field: 4" purge bailer was cleaned between wells

Samples collected: 2- VOA's BTEX & TPH

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (usmos/cm)	Temperature (oC)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)
10:50				8.30	0	
					21.35	
11:15				17.64		

Bailing start time: 10:58 WL 8.30

Bailing stop time: 11:15 WL 17.64

Comments:

Transportation (thermal preservation):

Form Completed by: Sampled by: Brandon Pabst

1011/3-89

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Sampling Information Sheet

Weather Condition:

Cloud Cover: NONE

Wind Speed: Zero

Temperature: 60°

Sampling point: MW-5 Project: OAKland Shell

Location: OAKLAND CALIF W.O. #: 40-88-666

Sample ID#: MW-5/012390/ Date sampled: 01/23/90 Time: 14:30 AM / PM

Describe sampling point: well located at south end of property near phone booth

Well depth: 24.82 ft. below MP Casing diameter: 4" inches

Depth to water (below MP) 7.89 ft. Date: 01/23/90 Time: 14:15 AM / PM

Discharge rate = _____ gpm x 0.00223 = _____ cfs.

At least 3 WELL bore volumes have been evacuated before sampling.

Sampling method: _____ Tap _____ Submersible pump 2" Bailer _____ Other: _____

Pump intake or bailer set at _____ ft. below MP

Tubing (type: _____), (new or previously used) was used to collect all samples (___yes ___no)

and all field measurements (___Yes ___no). Tubing used only for: _____

Sample appearance: CLOUDY Odor: NONE

Note any sampling problems: _____

Note any cleaning performed in field: 4" bailer cleaned between wells

Samples collected: 2 VOA VIALS FOR FUEL FINGERPRINT

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (oC)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)
14:15				7.89	0	
14:30				18.84	33.16	

Bailing start time: 14:15 WL 7.89

Bailing stop time: 14:30 WL 18:84

Comments: _____

Transportation (thermal preservation): _____

Form Completed by: _____ Sampled by: _____

1011/3-89

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Sampling Information Sheet

Weather Condition:

Cloud Cover: None

Wind Speed: Zero

Temperature: 60°

Sampling point: MW-8 Project: Oakland Shell

Location: Oakland W.O. #: 40-88-666

Sample ID#: MW-8/012396/11:32 Date sampled: 01/23/96 Time: 11:32 AM / PM

Describe sampling point: well located in Northwest corner of property

Well depth: 19.99 ft. below MP Casing diameter: 4 inches

Depth to water (below MP) 7.19 ft. Date: 01/23/96 Time: 11:21 AM / PM

Discharge rate = _____ gpm x 0.00223 = _____ cfs.

At least 3 well volumes have been evacuated before sampling.

Sampling method: _____ Tap _____ Submersible pump X Bailer _____ Other: _____

Pump intake or bailer set at _____ ft. below MP

Tubing (type: _____), (new or previously used) was used to collect all samples (___yes ___no)

and all field measurements (___Yes ___no). Tubing used only for: _____

Sample appearance: silty brown Odor: None

Note any sampling problems: _____

Note any cleaning performed in field: 4" bailer cleaned between wells

Samples collected: 2- VOA vials - BTEX, TPH

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (oC)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)
11:21				7.19		
11:32				18.98	25 gal	

Bailing start time: 11:21 WL 7.19

Bailing stop time: 11:32 WL 18.98

Comments: _____

Transportation (thermal preservation): _____

Form Completed by: _____ Sampled by: Brandon Pabst

1011/3-89

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Sampling Information Sheet

Weather Condition:

Cloud Cover: NONE

Wind Speed: ZERO

Temperature: 60°

Sampling point: MW-3 Project: OAKLAND SHELL

Location: OAKLAND CALIF W.O. #: 40-883-Cd.6

Sample ID#: MW-3 Date sampled: 1/23/90 Time: 14.05 AM / PM

Describe sampling point: well located near south east corner of station building

Well depth: 26.73 ft. below MP Casing diameter: 4" inches

Depth to water (below MP) 9.04 ft. Date: 1/23/90 Time: 13:30 AM / PM

Discharge rate = _____ gpm x 0.00223 = _____ cfs.

At least 3 WELL bore volumes have been evacuated before sampling.

Sampling method: _____ Tap _____ Submersible pump 2" Bailer _____ Other: _____

Pump intake or bailer set at _____ ft. below MP

Tubing (type: PLASTIC), (new or previously used) was used to collect all samples (___yes ___no) and all ffield measurements (___Yes ___no). Tubing used only for: MW-1

Sample appearance: CLOUDY BROWN Odor: STRONG

Note any sampling problems: _____

Note any cleaning performed in field: 4" purge bailer cleaned between wells

Samples collected: 2 VOA VIALS FOR FUEL FINGERPRINT

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (oC)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)
13:30				9.04	0	
14.05				10.60	35.0	

Bailing start time: 13:30 WL 9.04

Bailing stop time: 14:05 WL 10.60

Comments: _____

Transportation (thermal preservation): _____

Form Completed by: CB POTEET Sampled by: CB POTEET

1011/3-89

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Sampling Information Sheet

Weather Condition:

Cloud Cover: NONE

Wind Speed: ZERO

Temperature: 60°

Sampling point: MW-6 Project: Oakland Shell

Location: Oakland W.O. #: 40-88-666

Sample ID#: MW-6/012390/11:55 Date sampled: 01/23/90 Time: 11:55 AM / PM

Describe sampling point: well located in northeast corner of property

Well depth: 19.90 ft. below MP Casing diameter: 4 inches

Depth to water (below MP) 7.57 ft. Date: 01/23/90 Time: 11:41 AM / PM

Discharge rate = _____ gpm x 0.00223 = _____ cfs.

At least 3 bore volumes have been evacuated before sampling.

Sampling method: _____ Tap _____ Submersible pump X Bailer _____ Other: _____

Pump intake or bailer set at _____ ft. below MP

Tubing (type: _____), (new or previously used) was used to collect all samples (___yes ___no)

and all ffield measurements (___Yes ___no). Tubing used only for: _____

Sample appearance: silty brown Odor: NONE

Note any sampling problems: _____

Note any cleaning performed in field: 4" bailer cleaned between wells

Samples collected: 2- VOA VIALS - BTEX TPH

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (oC)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)
11:41				7.57		
11:55						
				18.13	24	

Bailing start time: 11:41 WL 7.57

Bailing stop time: 11:55 WL 18.13

Comments: _____

Transportation (thermal preservation): _____

Form Completed by: _____ Sampled by: P. Patton

1011/3-89

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Sampling Information Sheet

Weather Condition:

Cloud Cover: None

Wind Speed: Zero

Temperature: 60°

Sampling point: MW-9 Project: OAKLAND SHELL

Location: OAKLAND CALIF W.O. #: 40-88-1066

Sample ID#: MW-9-12390 Date sampled: 1/23/90 Time: 12:40 AM / PM

Describe sampling point: well located on 35th Street

Well depth: 19.73 ft. below MP Casing diameter: 4" inches

Depth to water (below MP) 9.31 ft. Date: 1/23/90 Time: 12:15 AM / PM

Discharge rate = _____ gpm x 0.00223 = _____ cfs.

At least 3 WELL bore volumes have been evacuated before sampling.

Sampling method: _____ Tap _____ Submersible pump 2" Bailer _____ Other: _____

Pump intake or bailer set at _____ ft. below MP

Tubing (type: PLASTIC), (new or previously used) was used to collect all samples (___yes ___no)

and all field measurements (___Yes ___no). Tubing used only for: MW-9

Sample appearance: _____ Odor: _____

Note any sampling problems: _____

Note any cleaning performed in field: 4" bailer cleaned between wells

Samples collected: 2 VOA VIALS BTEX TPH

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (oC)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)
12:15				9.31	0	
12:25					15.0	LET RECHARGE
12:35					5.0	
12:40				16.65	SAMPLE	

Bailing start time: 12:15 WL 9.31

Bailing stop time: 12:40 WL 16.65

Comments: _____

Transportation (thermal preservation): _____

Form Completed by: C B POTEET Sampled by: BO PATTON

1011/3-89

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Sampling Information Sheet

Weather Condition:

Cloud Cover: NONE

Wind Speed: ZERO

Temperature: 60°

Sampling point: MW-7 Project: Oakland Shell

Location: Oakland W.O. #: 40-88-666

Sample ID#: mw-7/012390/ Date sampled: 01/23/90 Time: 12:45 AM / PM

Describe sampling point: well located 40 feet south of mw-8

Well depth: 19.47 ft. below MP Casing diameter: 4 inches

Depth to water (below MP) 6.98 ft. Date: 01/23/90 Time: 12:29 AM / PM

Discharge rate = _____ gpm x 0.00223 = _____ cfs.

At least 3 bore volumes have been evacuated before sampling.

Sampling method: _____ Tap _____ Submersible pump X Bailer _____ Other: _____

Pump intake or bailer set at _____ ft. below MP

Tubing (type: _____), (new or previously used) was used to collect all samples (___yes ___no)

and all field measurements (___Yes ___no). Tubing used only for: _____

Sample appearance: clear-slightly cloudy Odor: NONE

Note any sampling problems: _____

Note any cleaning performed in field: 4" bailer cleaned between wells

Samples collected: 2-VOA vials: BTEX, TPH

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (oC)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)
12:29				6.98		
12:45				18.56	25	

Bailing start time: 12:29 WL 6.98

Bailing stop time: 12:45 WL 18.56

Comments: _____

Transportation (thermal preservation): _____

Form Completed by: _____ Sampled by: Bob Dalton

1011/3-89

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Sampling Information Sheet

Weather Condition:

Cloud Cover: NONE

Wind Speed: ZERO

Temperature: 60°

Sampling point: MW-1 Project: OAKLAND SHELL

Location: OAKLAND CALIF W.O. #: 10-99-1666

Sample ID#: MW-1 12390 Date sampled: 1/23/90 Time: _____ AM / PM

Describe sampling point: _____

Well depth: _____ ft. below MP Casing diameter: 4" inches

Depth to water (below MP) _____ ft. Date: 1/23/90 Time: _____ AM / PM

Discharge rate = _____ gpm x 0.00223 = _____ cfs.

At least _____ bore volumes have been evacuated before sampling.

Sampling method: _____ Tap _____ Submersible pump Z' Bailer _____ Other: _____

Pump intake or bailer set at _____ ft. below MP

Tubing (type: PLASTIC), (new or previously used) was used to collect all samples (___yes ___no)

and all field measurements (___Yes ___no). Tubing used only for: MW-1

Sample appearance: _____ Odor: STRONG

Note any sampling problems: _____

Note any cleaning performed in field: _____

Samples collected: FREE PRODUCT .01 NO SAMPLE

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (oC)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)
					0	

Bailing start time: _____ WL .01 FREE PRODUCT

Bailing stop time: _____ WL _____

Comments: NO SAMPLE taken well contained product

Transportation (thermal preservation): _____

Form Completed by: _____ Sampled by: Brandon Patel

1091/3-89

DELTA ENVIRONMENTAL CONSULTANTS, INC.

Sampling Information Sheet

Weather Condition:

Cloud Cover: NONE

Wind Speed: ZERO

Temperature: 60°

Sampling point: MW-4 Project: OAKLAND SHELL

Location: OAKLAND W.O. #: 40-888-6666

Sample ID#: MW-4/012390/13:05 Date sampled: 01/23/90 Time: 13:05 AM / PM

Describe sampling point: well located 20 feet south of pump islands. NEAR sidewalk of San Pablo Ave

Well depth: 23.06 ft. below MP Casing diameter: 4 inches

Depth to water (below MP) 9.25 ft. Date: 01/23/90 Time: 12:50 AM / PM

Discharge rate = _____ gpm x 0.00223 = _____ cfs.

At least 3 WELL ~~bore~~ volumes have been evacuated before sampling.

Sampling method: _____ Tap _____ Submersible pump _____ Bailer _____ Other: _____

Pump intake or bailer set at _____ ft. below MP

Tubing (type: PLASTIC), (new or previously used) was used to collect all samples (___yes ___no)

and all ffield measurements (___Yes ___no). Tubing used only for: _____

Sample appearance: CLOUDY BROWN Odor: moderate → strong

Note any sampling problems: _____

Note any cleaning performed in field: 4" bailer cleaned between wells

Samples collected: 2 VOA VIALS FOR FUEL FINGERPRINT

EVACUATION/STABILIZATION TEST DATA

Time	pH Units	Temperature Corrected Conductance (umhos/cm)	Temperature (oC)	Water Level (Nearest 0.01 ft.)	Cumulative Volume of Water Removed from Well (gallons)	Pumping Rate (gpm)
12:50				9.25	0	
13:05						
				16.11	27	

Bailing start time: 12:50 WL 9.25

Bailing stop time: 13:05 WL 16.11

Comments: SHEEN APPARENT

Transportation (thermal preservation): _____

Form Completed by: BO PATTON Sampled by: CB POTTER

1011/3-89

APPENDIX E

Laboratory Analytical Results
Water 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: #40-88-666, 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

VM Tague

Vickie Tague
Project Manager

SEQUOIA ANALYTICAL

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

Delta Environmental Consultants	Client Project ID:	#40-88-666, Shell, Oakland	Sampled:	Jan 23, 1990
3330 Data Drive	Matrix Descript:	Water	Received:	Jan 25, 1990
Rancho Cordova, CA 95670	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Jan 29, 1990
Attention: Hal Hansen	First Sample #:	001-3555 A	Reported:	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	MW-2	40,000	110	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**	**0.3**	**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

DELTA
ENVIRONMENTAL CONSULTANTS, INC.

Project: OAKLAND SHELL OAKLAND CHUE
Shipped by: (FEDEX)
Shipped to: SEQUOIA LABS
Comments:

W.O. # 40-88-166

Attention of:
Hazardous materials suspected? (yes/no)

Sampling Point	Location	Field ID #	Date	Sample Type	No. of Containers	Analysis Required
MW-2	OAKLAND CHUE	MW-2 11:15	1-23-90	WATER	2	TPH-G (8015)
~~MW-3~~ OK	VIAL LABELED ONE 15 3 - USE IT	(labelled MW-1 13:50) MW-3 14:05				
MW-4		MW-4 13:05				
MW-5		MW-5 14:30				
MW-6		MW-6 11:55				
MW-7		MW-7 12:45				
MW-8		MW-8 11:32				
MW-9		MW-9 12:40				

Sampler(s) (signature) C. Braden Tofte

Field ID	Relinquished by: (signature)	Received by: (signature)	Date/Time	Comments
ALL SAMPLES	C. Braden Tofte	[illegible]	14:15 1-23-90	

Sealed for shipment by: (signature) C. Braden Tofte Date/Time 1-24-90 10:00 Shipment method: (FEDEX)

Received for Lab by: (signature) _____ Date/Time _____ Comments _____

RESULTS TO: Phil Howsen Delta Environmental
3330 Data Drive
Rancho Cordova CA
95670

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

DELTA
ENVIRONMENTAL CONSULTANTS, INC.

Sample Identification/Field Chain of Custody Record

Project: OAKLAND SHELL OAKLAND CALIF

W.O. # 40-88-666

Shipped by: [illegible]

Shipped to: SEQUOIA LABS

Attention of:

Comments:

Hazardous materials suspected? (yes/no)

Sampling Point	Location	Field ID #	Date	Sample Type	No. of Containers	Analysis Required
MW-2	OAKLAND CALIF	MW-2 11:15	1-23-90	WATER	2	FUEL FINGERPRINT
MW-3	↓	MW-3 14:05	↓	↓	↓	↓
MW-4	↓	MW-4 13:05	↓	↓	↓	↓
MW-5	↓	MW-5 14:30	↓	↓	↓	↓
MW-6	↓	MW-6 11:55	↓	↓	↓	↓
MW-7	↓	MW-7 12:45	↓	↓	↓	↓
MW-8	↓	MW-8 11:32	↓	↓	↓	↓
MW-9	↓	MW-9 12:40	↓	↓	↓	↓

Sampler(s) (signature) [signature]

Field ID	Relinquished by: (signature)	Received by: (signature)	Date/Time		Comments
all samples	[signature]				

Sealed for shipment by: (signature) [signature] Date/Time 1-24-90 10:00 Shipment method: GROUND

Received for Lab by: (signature) Date/Time Comments

RESULTS TO: HAL HANSEN DELTA ENV. CONSULTANTS

3330 DELTA DRIVE

RANCHO CORDOVA CA

95670

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