Texaco Refining
and Marketing Inc

108 Cutting Boulevard
Richmond CA 94804

April 15, 1991

Mr. Rafat Shahid
Alameda County Environmental
Health Department
80 Swan Way, Room 200
Oakland, CA 94621

Dear Mr. Shahid:

Enclosed is a copy of our Quarterly Status Report dated December 3, 1990 for our former Texaco Service Station located at 2225 Telegraph Avenue in Oakland, California. We are sending you this copy in case you have not previously received the Status Report. This report covers the period from July through September, 1990.

Please call me at (415) 236-1770 if you have any questions.

Very truly yours,

R.R. Zielinski
Environmental Supervisor

Enclosures

cc: Mr. Tom Callaghan
California Regional Water
Quality Control Board
San Francisco Bay Area Region
2101 Webster Street, Ste. 500
Oakland, CA 94612

pr:6/7

KEG

2225TA.RS

A Report Prepared for

Texaco Refining and Marketing Inc.
10 Universal City Plaza
Universal City, California 91608

No new data!

QUARTERLY TECHNICAL REPORT
THIRD QUARTER OF 1990
FORMER TEXACO STATION
2225 TELEGRAPH AVENUE
OAKLAND, CALIFORNIA

HLA Job No. 2251,125.03
December 3, 1990
1990 Report No. 3

by

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INTRODUCTION

This quarterly technical report (QTR) presents the results of site investigation and remediation activities conducted by Harding Lawson Associates (HLA) at a service station site formerly owned by Texaco Refining and Marketing Inc. The station, at 2225 Telegraph Avenue, Oakland, California (see Plate 1), is currently owned and operated by Exxon Company U.S.A. This QTR summarizes HLA's work at the site, ongoing since May 1988, and presents results of the recent quarter's work.

SITE DESCRIPTION

The site is on the southwest corner of the intersection of Telegraph and West Grand Avenues (Plate 2). The surrounding area contains commercial/retail businesses, including a Chevron service station immediately across Telegraph Avenue and a Beacon service station northeast of the site. Adjacent to the site on the south is the First Baptist Church of Oakland. There is an apartment building, currently occupied, immediately west of the site.

Surface elevation at the site is approximately 20 feet above mean sea level. The land surface slopes gently southeast, toward Lake Merritt and the Oakland/Alameda Inner Harbor, an area of tidal flats that has been filled. This area has been extensively developed, and surface runoff is mainly controlled by the municipal storm sewer system.

As shown on Plate 3, structures at the service station include a building, three fuel pump islands, one underground waste oil tank, and three underground fuel storage tanks. Leaded and unleaded gasoline are dispensed from these tanks; automotive repair services are also provided.

HYDROGEOLOGIC SETTING

The East Bay Plain has been divided into seven groundwater subareas, defined by the California Department of Water Resources (DWR) on the basis of areal differences (i.e., faults and other geologic conditions). This site lies within the Oakland Upland and Alluvial Plain subarea. Most groundwater used in the East Bay Plain is for irrigation or industrial, rather than domestic, purposes. The majority of domestic water is supplied by the East Bay Municipal Utility District (EBMUD) from surface sources.

The groundwater reservoir is made up of the Alameda and Temescal Formations, along with the Merritt Sand; these have an aggregate thickness of more than 1,100 feet. According to maps for the area, surface materials at the site are from the Temescal Formation, an alluvial fan deposit. Approximately 1,000 feet west of the site is an outcrop of the Merritt Sand. Direction of regional groundwater flow is south-southwest, toward San Francisco Bay.

Subsurface materials at the site, down to the maximum depth explored of 20 feet, generally consist of stiff, silty clay (CL),

underlain by a dense layer of silty sand that ranges from 3 to 8 feet in thickness. According to slug test results, the hydraulic conductivity of the shallow, saturated sand aquifer beneath the site ranges from 1.2 to 5.9 feet per day (Table 1).

Groundwater is currently encountered at approximately 13 feet below grade; well monitoring and survey data are presented in Table 2. **The estimated direction of groundwater flow is to the southwest**, with a gradient of 0.005 foot per foot, as shown on the Groundwater Surface Map, Plate 4.

SUMMARY OF PREVIOUS WORK

Previous Reports

Since May 1988, HLA has investigated soil and groundwater conditions at this site. To date, the investigation and remedial planning have comprised four sequential phases; results and proposed work were presented in the following reports:

1.	Sensitive Receptor Study	May 24, 1988
2.	Subsurface Investigation	July 20, 1988
3.	Environmental Assessment	June 22, 1989
4.	Groundwater Remediation Plan	November 30, 1989

Field Investigation

Boring locations are shown on Plate 3. Because of restricted subsurface access on Telegraph and West Grand Avenues, no off-site exploration was conducted north or east of the site. These restrictions were imposed by the City of Oakland and the

Bay Area Rapid Transit District (BART), whose tunnel is in this area (see Plate 2).

During previous quarters at the site, the following activities have been completed:

- Conducted a soil-gas survey on site and in city streets near the site. Probe locations are shown on Plate 3 and soil-gas survey results are presented in Table 3.
- Drilled and sampled seven shallow soil borings (B-1 through B-7); locations are shown on Plate 3.
- Drilled, constructed, developed, and sampled six on-site monitoring wells (MW-6A through MW-6F) and three off-site wells (MW-6G through MW-6I); locations are shown on Plate 5.
- Ordered chemical analyses on soil and water samples to determine concentrations of petroleum hydrocarbons; results of analyses are presented in Tables 4 and 5, respectively.
- Conducted slug tests in MW-6D, MW-6E, and MW-6H to estimate hydraulic conductivity and transmissivity values for the shallow aquifer; slug test results are presented in Table 1.

Site Remediation

The following tasks have been completed during the remedial process:

- Drilled and installed three recovery wells, RW-1, RW-2, and RW-3 (locations shown on Plate 3). RW-1 was constructed at the same location as Soil Boring B-3. Two-inch-diameter wells (Monitoring Wells MW-6D and MW-6C) were drilled out and deepened to 25 feet to facilitate installation of four-inch-diameter recovery wells (RW-2 and RW-3).
- Fabricated skid-mounted groundwater treatment system.

SUMMARY OF PREVIOUS FINDINGS

Vadose-zone Soil Condition

No significant concentrations of petroleum hydrocarbons have been found in vadose-zone soils. The fuel constituents benzene, toluene, ethylbenzene, and xylenes (BTEX) and total petroleum hydrocarbons (TPH) have been detected in concentrations exceeding 100 parts per million (ppm) exclusively in soils at 12 to 13.5 feet below the ground surface (Table 4); this depth is within the zone of fluctuation of the groundwater table.

Groundwater Condition

Free product sheen has been observed on the surface of water purged from RW-1. As shown on Plate 5, hydrocarbons dissolved in the groundwater are generally limited to the vicinity of the tanks and pump islands, extending southwest.

Water from five on-site wells near the tanks and pump islands contains detectable levels of TPH as gasoline. As of April 1990, the lateral limits of the plume are delineated by MW-6G, MW-6F, and MW-6I; samples from these wells show no detectable hydrocarbons (detection limit for TPH = 50 parts per billion [ppb]). Upgradient plume definition is incomplete because of the restricted subsurface access, mentioned above, which is imposed by the City of Oakland and BART.

WORK PERFORMED DURING THE THIRD QUARTER OF 1990

1. Purged all recovery wells to remove sand and silt. Free product sheen was observed on the surface of water purged from RW-1.

2. Completed fabrication of groundwater treatment system.

3. Awarded bid for installation of groundwater collection system.

4. Obtained City of Oakland permits for installation of groundwater collection and treatment system.

5. Excavated trenches and installed electrical conduits, double-contained groundwater extraction lines, and sewer discharge lines.

6. Transported groundwater treatment system to site and installed it on a concrete pad.

WORK PLANNED FOR THE FOURTH QUARTER OF 1990

1. Obtain final City of Oakland construction inspection.

2. Start-up the extraction and treatment system, with discharge of treated water to an above-ground tank. The system will be monitored according to the schedule presented in Table 6.

3. Upon receiving approval from East Bay Utility District under Wastewater Discharge Permit No. 001-00007, the contents of the tank will be discharged to the sanitary sewer and the treatment system will be directly connected to the sewer discharge line.

4. Sample water for chemical analyses and measure water levels in monitoring wells to evaluate the effectiveness of the groundwater extraction system.

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Table 1. Slug Test Results
2225 Telegraph Avenue
Oakland, California

Well Number	Most Permeable Stratum Adjacent to Well Screen			
	Lithology	Classification	Thickness (feet)	Estimated Hydraulic Conductivity (feet/day)
MW-6D	sand	confined	2	5.9
MW-6E	sand, fine-grained	confined	2.5	1.2
MW-6H	sand, medium-grained	unconfined	6	4.8

Table 2. Well Monitoring and Survey Data
2225 Telegraph Avenue
Oakland, California

Well No.	Date	Top of Casing Elevation[1] (feet)	Depth to Groundwater (feet)	Groundwater Surface Elevation[2] (feet)	Incremental Water Elevation Change[3] (feet)	Total Water Elevation Change Since 12/15/88[4] (feet)
MW-6A	12/15/88	98.99	13.77	85.22	--	--
	10/03/89		13.40	85.59	-0.37	-0.37
	05/11/90		12.87	86.12	-0.53	-0.90
MW-6B	12/15/88	98.81	13.01	85.80	--	--
	10/03/89		12.94	85.87	-0.07	-0.07
	04/30/90		12.53	86.28	-0.41	-0.48
MW-6C	12/15/88	99.89	14.41	85.48	--	--
	10/03/89		14.10	85.79	-0.31	-0.31
	04/30/90		13.81	86.08	-0.29	-0.60
MW-6D	12/15/88	98.78	13.53	85.25	--	--
	10/03/89		13.44	85.34	-0.09	-0.09
	04/30/90		13.19	85.59	-0.25	-0.34
MW-6E	12/15/88	98.99	13.84	85.15	--	--
	10/03/89		13.70	85.29	-0.14	-0.14
	04/30/90		13.43	85.56	-0.27	-0.41
MW-6F	12/15/88	99.91	14.73	85.18	--	--
	10/03/89		14.48	85.43	-0.25	-0.25
	04/30/90		14.14	85.77	-0.34	-0.69
MW-6G	12/15/88	99.16	12.39	86.77	--	--
	10/03/89		12.22	86.94	-0.17	-0.17
	04/30/90		11.73	87.43	-0.49	-0.66
MW-6H	12/15/88	97.93	12.39	85.54	--	--
	10/03/89		12.36	85.57	-0.03	-0.03
	04/30/90		12.10	85.83	-0.29	-0.29
MW-6I	12/15/88	97.60	12.82	84.78	--	--
	10/03/89		12.83	84.77	+0.01	+0.01
	04/30/90		12.66	84.94	-0.17	-0.16

Notes:

1 Elevation relative to HLA temporary benchmark located at the western end of the dispenser island nearest West Grand Avenue, with an arbitrary elevation of 100.0 feet (see Plate 3).

2 Groundwater surface elevation = top of casing elevation - depth to water.

3 Incremental groundwater elevation change = groundwater elevation - previous groundwater elevation.

4 Total groundwater elevation change = groundwater elevation - groundwater elevation on 12/15/88

Table 3. Results of Soil-gas Survey
2225 Telegraph Avenue
Oakland, California

Conducted on September 19, 1988
Concentrations in micrograms per liter (μg/L)

Sample	Depth (feet)	Benzene	Ethyl-benzene	Toluene	Xylenes	Total Petroleum Hydrocarbons
Air	N/A	<0.7	<0.8	<0.8	<0.8	<0.7
SG-01	--	--	--	--	--	--
SG-02	5.0	<0.7	<0.8	<0.8	<0.8	<0.7
SG-03	12.0	10	4	<0.8	2,800	6,100
SG-04	13.0	<0.7	<0.8	<0.8	140	780
WS-05*	12.0	<75	<76	<77	<77	<75
SG-06	13.0	<0.7	<0.8	<0.8	<0.8	<0.7
SG-07	--	--	--	--	--	--
Air	N/A	<0.7	<0.8	<0.8	<0.8	<0.7

-- - Not able to obtain sample
N/A - Not applicable
Air - Ambient air sample
* - WS-05 was a sample of groundwater

Table 4. Results of Soil Chemical Analyses
2225 Telegraph Avenue
Oakland, California

Concentrations in milligrams per kilogram (mg/kg)

Sample Number	Depth (feet)	Benzene [1]	Ethyl-benzene [2]	Toluene [3]	Xylenes [3]	TPH as Gasoline [4]
B-1	8.0	0.05	ND	ND	ND	ND
B-1	13.0	ND (5)	10 (10)	16 (10)	41 (10)	2,000 (1,000)
B-2	7.0	ND	ND	ND	ND	ND
B-2	13.5	ND	ND	ND	ND	ND
B-3	7.0	0.06	ND	ND	ND	ND
B-3	13.5	40 (25)	84 (50)	390 (50)	370 (50)	11,000 (5,000)
B-4	13.5	ND	ND	ND	ND	ND
B-5	5.5	ND	ND	ND	ND	ND
B-5	9.5	ND	ND	ND	ND	ND
B-5	12.5	ND	ND	ND	ND	ND
B-6	6.0	ND	ND	ND	ND	ND
B-6	9.5	ND	ND	ND	ND	ND
B-6	12.0	40 (5)	40 (20)	110 (10)	450 (10)	3,000 (1,000)
B-7	6.0	0.64	0.4	0.9	3.4	24
B-7	9.5	0.5	ND	0.7	1.0	ND
B-7	12.0	20 (5)	20 (20)	72 (10)	190 (10)	1,400 (1,000)
MW-6E	13.0	ND	ND	ND	ND	ND
MW-6F	13.0	ND	ND	ND	ND	ND
MW-6G	13.5	ND	ND	ND	ND	5.2
MW-6H	13.5	11 (0.5)	8.8 (2)	3.2 (1)	19 (1)	1,000 (495)
MW-6I	13.5	ND	ND	ND	ND	ND

ND = Not detected.

1 Detection limit 0.05 mg/kg except as noted in parentheses.
2 Detection limit 0.2 mg/kg except as noted in parentheses.
3 Detection limit 0.1 mg/kg except as noted in parentheses.
4 Detection limit 10 mg/kg except as noted in parentheses.

Table 5. Results of Groundwater Chemical Analyses
2225 Telegraph Avenue
Oakland, California

Concentrations in micrograms per liter (µg/L)

EPA TEST METHOD 602

Well Number	Date Sampled	Benzene[1]	Ethylbenzene[2]	Toluene[3]	Xylenes[3]	TPH[4] (as gasoline)
MW-6A	06/24/88	ND	ND	ND	ND	-
	10/20/88	1	ND	ND	ND	
	09/07/89	2	ND	ND	ND	ND
	05/11/90	150	ND (0.25)	6.2	13	ND (500)
MW-6B	06/24/88	ND	ND	ND	5	-
	10/20/88	4	ND	3	ND	-
	09/07/89	70 (2.5)	60 (3)	8 (3)	160 (4)	2,700 (25)
	04/30/90	45 (5)	20 (5)	6 (5)	22 (5)	168 (50)
MW-6C	06/24/88	7,400	170	7	2,300	-
	10/20/88	9,500 (50)	170 (2)	65 (100)	850 (1)	-
	09/07/89	7,900 (25)	350 (25)	430 (25)	1,100 (38)	18,000 (2,500)
	04/30/90	6,100 (250)	1,000 (250)	1,500 (250)	2,700 (250)	30,000 (25,000)
MW-6D	07/11/88	220 (5)	ND (20)	27 (10)	ND (10)	-
	10/20/88	710 (5)	22 (20)	74 (10)	110 (10)	-
	09/07/89	600 (12.5)	58 (13)	26 (13)	31 (19)	2,200 (1,250)
	04/30/90	800 (50)	310 (50)	150 (50)	280 (50)	3,600 (500)
MW-6E	10/20/88	1	ND	ND	3	
	09/07/89	3	ND	ND	ND	220
	04/30/90	57 (5)	ND (5)	ND (5)	53 (5)	250 (50)
MW-6F	10/25/88	ND	ND	ND	2	
	09/07/89	ND	ND	ND	ND	ND
	04/30/90	ND	ND	ND	ND	ND
MW-6G	12/07/88	ND	ND	ND	ND	-
	09/07/89	ND	ND	ND	ND	ND
	04/30/90	ND	ND	ND	ND	ND
MW-6H	12/07/88	1,200 (25)	110 (20)	320 (10)	220 (10)	-
	09/07/89	480 (10)	16 (10)	ND (10)	ND (15)	660 (500)
	04/30/90	700 (50)	31 (5)	39 (5)	50 (5)	630 (500)
MW-6I	12/07/88	ND	ND	ND	ND	-
	09/07/89	ND	ND	ND	ND	ND
	04/30/90	ND	ND	ND	ND	ND

ND = Not detected.

Detection limits given in parentheses, where applicable. If not:

1. Detection limit = 0.5
2. Detection limit = 2
3. Detection limit = 1
4. Detection limit = 50

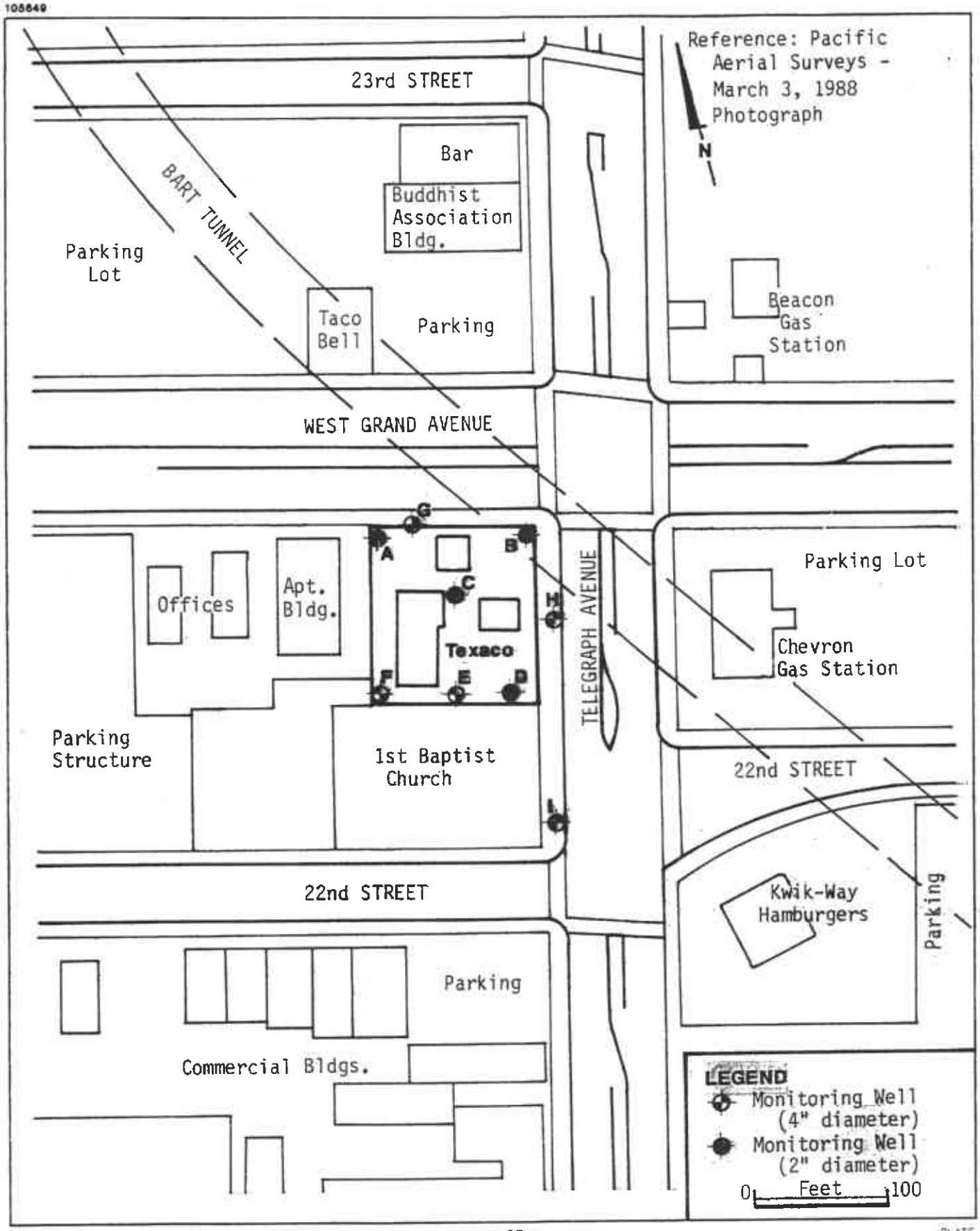
Table 6. Schedule for Sampling, Measurement, and Analysis
Groundwater Treatment System
2225 Telegraph Avenue
Oakland, California

	Sampling Station		
Measurement/Analysis	Influent	Effluent	Intermediate
Type of Sample	G	G	G
Flow Rate*	D/W/M	D/W/M	--
pH	D/W/M	D/W/M	--
Temperature	D/W/M	D/W/M	--
Electrical Conductivity	D/W/M	D/W/M	--
EPA 8020 for: Benzene, Toluene, Total xylenes, Ethylbenzene	D/W/M	D/W/M	W/M
EPA 8015 for: total petroleum hydrocarbons (as gasoline)	D/W/M	D/W/M	W/M
SMWWA 2450D for: Total Suspended Solids	D/W/M	D/W/M	--
SMWWA 5220A for: Chemical Oxygen Demand Filtered	D/W/M	D/W/M	--
EPA 524.2 for: Volatile organics; Drinking water quality	--	S	--
EPA 200 Series for: Priority Pollutant Metals	--	S	--

NOTES
Discharging under East Bay Municipal Utilities District Wastewater Permit Account No. 001-00007

G = Grab sample.
W/M = weekly for first 3 weeks, monthly thereafter.
D/W/M = 2 hours after system startup; every 24 hours thereafter for 4 days; weekly thereafter for 3 weeks, and monthly thereafter.
S = 2 hours after system start up
SMWWA = Standard Method Water and Wastewater Analyses, 17th edition.
* == A flow totalizer will record cumulative effluent discharge volume.

105849

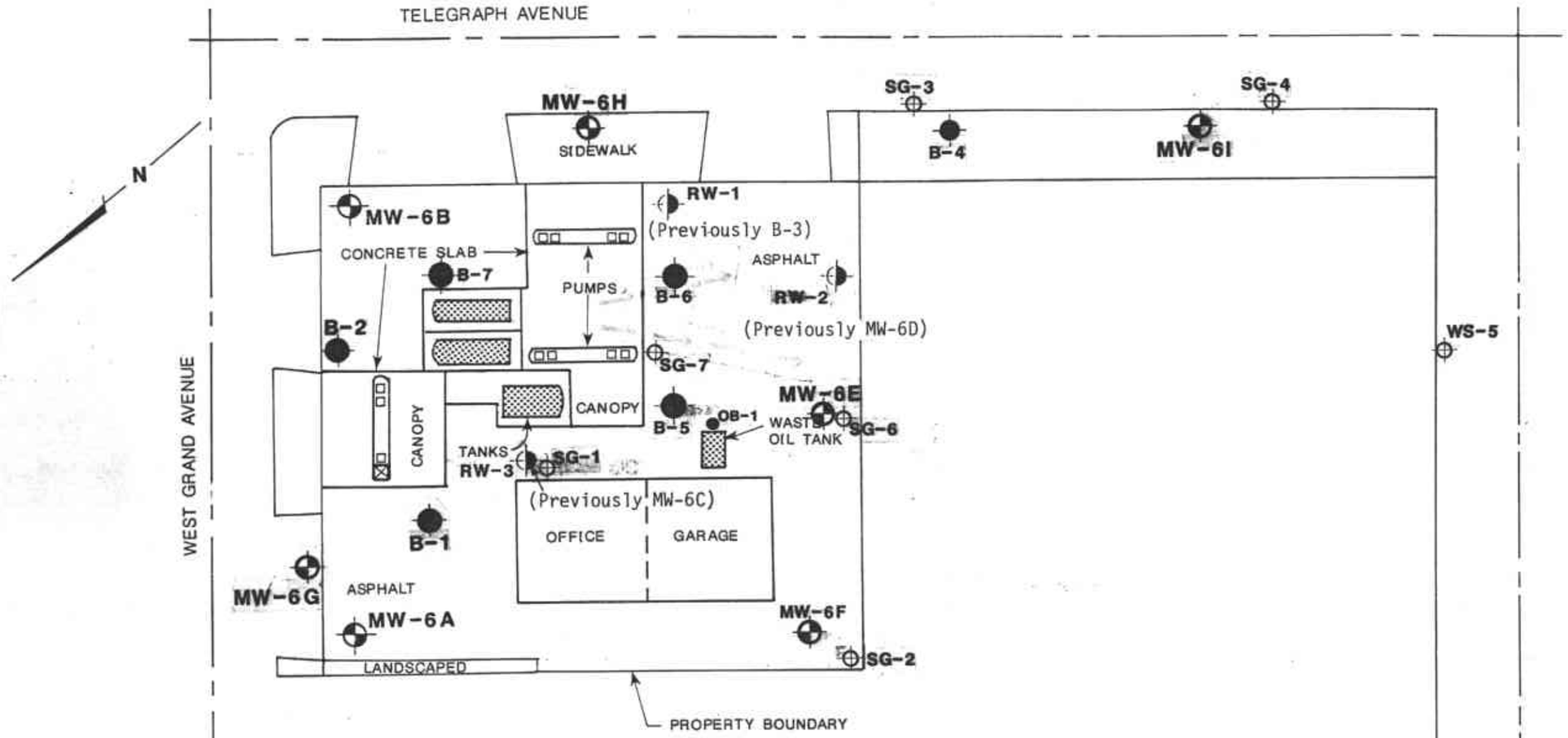


Harding Lawson Associates
Engineers and Geoscientists

Area Map
Former Texaco Service Station
2225 Telegraph Avenue
Oakland, California

PLATE **2**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
YC	2251,080.03		12/88		



EXPLANATION

MW-6A — Monitoring Well Location and Number

OB-1 — Observation Well Location and Number

B-2 — Boring Locations

SG-1 — Soil-Gas Probe Location

RW-1 — Recovery Well

Bench Mark (HLA Datum El. = 100 feet)

30 60

SCALE IN FEET

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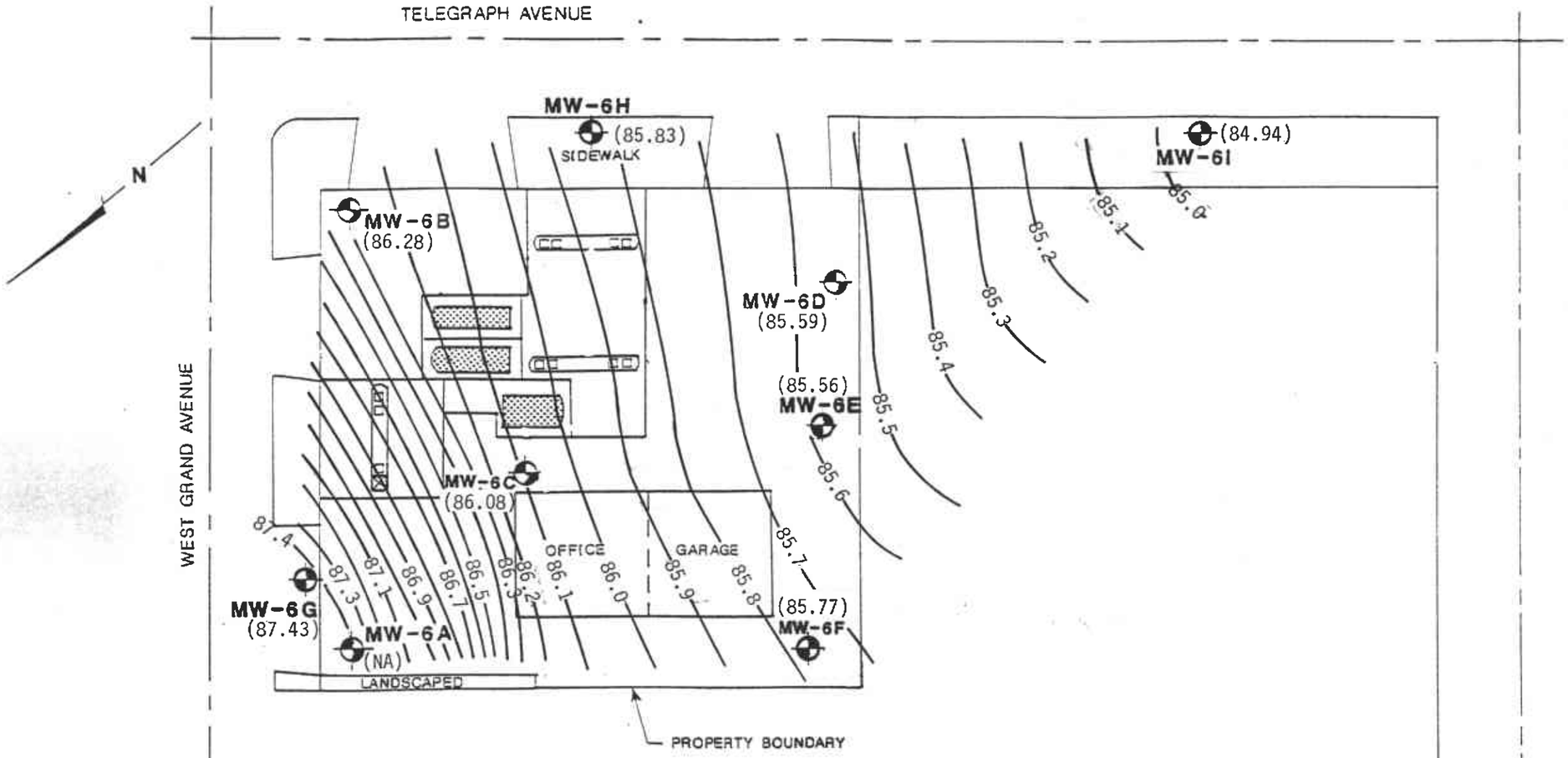
Site Plan
Former Texaco Service Station
2225 Telegraph Avenue
Oakland, California

PLATE 3

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
YC	2251,111.03		2/89		



EXPLANATION

MW-6A ⊕ Monitoring Well Location and Groundwater Surface Elevation on 4/30/90

⊠ Bench Mark (HLA Datum El. = 100 feet)

—86.3— Contour of Equal Groundwater Elevation

NA Not Accessible

30 60

SCALE IN FEET

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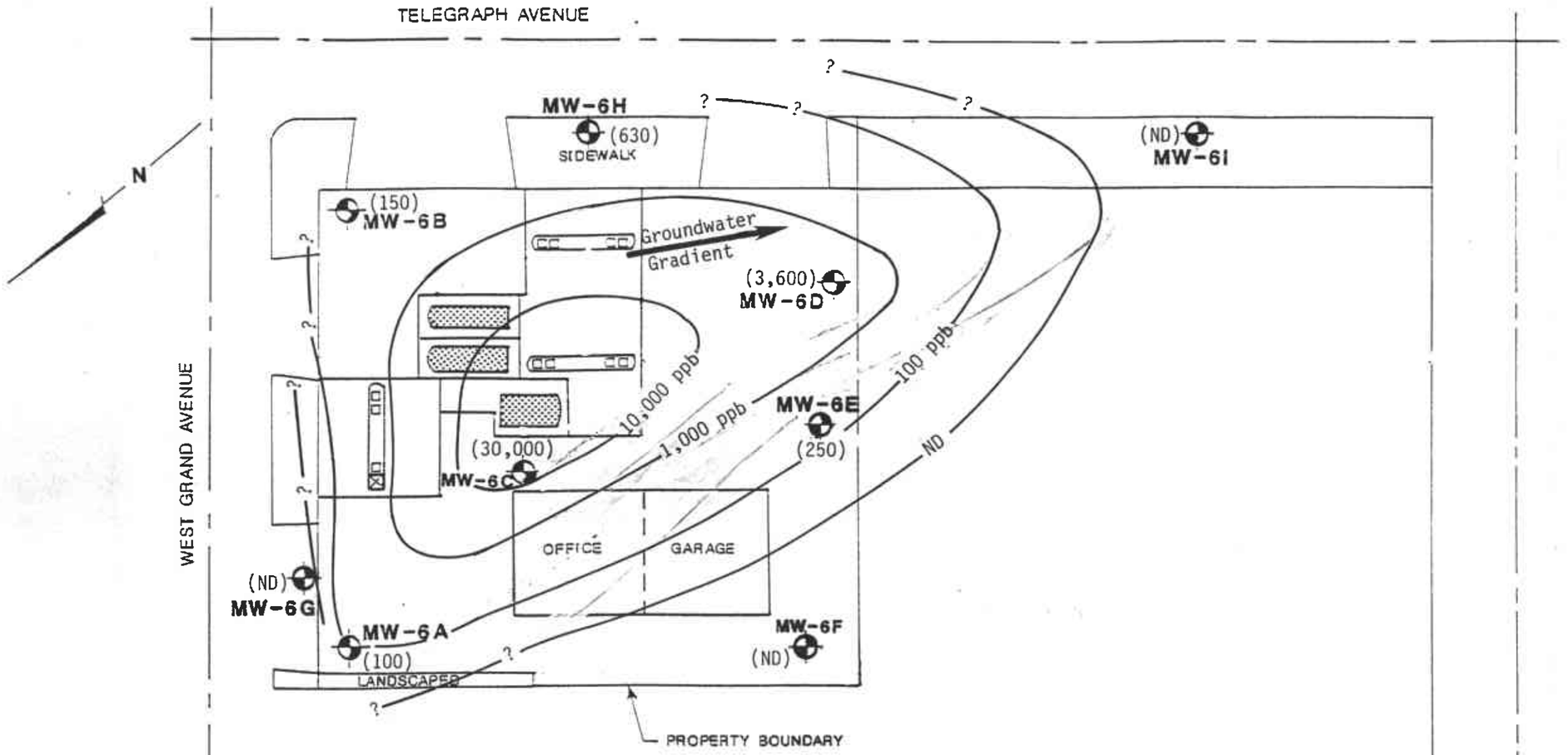
Engineers and Geoscientists

Groundwater Surface Map (4/90)
Former Texaco Service Station
2225 Telegraph Avenue
Oakland, California

PLATE **4**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
YC	2251,123.03		7/90		



EXPLANATION

MW-6A — Monitoring Well Location and Number

(630) Total Petroleum Hydrocarbons (TPH) as Gasoline Concentration on April 30, 1990 (concentration in ppb).

—— Contour of Constant TPH Concentration

⊠ Bench Mark (HLA Datum El. = 100 feet)

ND Not Detectable (<50 ppb)

* Well sampled on May 10, 1990

30 60

SCALE IN FEET

Harding Lawson Associates
Engineers and Geoscientists

Distribution of Hydocarbons in Groundwater (4/90)
Former Texaco Service Station
2225 Telegraph Avenue
Oakland, California

5

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
YC	2251,123.03		7/90		

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MAS/RS/pkp 031786M/R41

QUALITY CONTROL REVIEWER

Stephen J. Osborne
Principal Engineer