



TEXACO REFINING AND MARKETING INC.  
100 CUTTING BOULEVARD  
RICHMOND, CA 94804

April 6, 1990


Ms. Dyan Whyte  
San Francisco Regional Water  
Quality Control Board  
1111 Jackson Street, Room 6000  
Oakland, CA 94607

Dear Ms. Whyte:

Enclosed is a copy of our Quarterly Technical Report dated  
March 21, 1990 for our former Texaco Service Station located  
at 500 Grand Avenue in Oakland, California.

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

Very truly yours,

  
R.R. Zielinski  
Field Environmental  
Supervisor

RRZ:pap

Enclosure

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

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A Report Prepared for

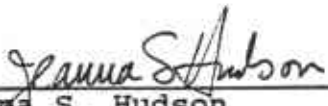
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~~2000~~ Cutting Boulevard  
Richmond, California 94804

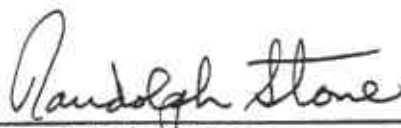
236-1770

QUARTERLY TECHNICAL REPORT  
FOURTH QUARTER OF 1989  
FORMER TEXACO STATION NO. 6248800235  
500 GRAND AVENUE  
OAKLAND, CALIFORNIA

HLA Job No. 2251,081.03

by

  
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March 31, 1990

## INTRODUCTION

Harding Lawson Associates (HLA) submits this Quarterly Technical Report (QTR) of site investigation activities at former Texaco service station No. 6248800235, located at 500 Grand Avenue in Oakland, California (Plate 1). This report summarizes the previous work at the site and accomplishments of the fourth quarter 1989. Planned activities for the first quarter 1990 are presented.

## SUMMARY OF PREVIOUS WORK

Texaco Refining and Marketing Inc. retained HLA to conduct a sensitive receptor survey at the subject location in May 1988. In June 1988 Texaco Refining and Marketing Inc. requested that HLA proceed with a subsurface investigation to evaluate whether hydrocarbons had affected shallow soil or groundwater. Since 1988, HLA has completed the following tasks in the site investigation:

- Conducted a soil-gas survey at 18 locations on or near the site (survey performed by Tracer Research Corporation)
- Drilled and developed four 2-inch-diameter groundwater monitoring wells (MW-8A, MW-8B, MW-8C, and MW-8D) and three 4-inch-diameter monitoring wells (MW-8E, MW-8F and MW-8G). Locations are shown on Plate 2.
- Obtained groundwater samples from each well and analyzed them for benzene, toluene, ethylbenzene, and total xylenes (BTEX), and total petroleum hydrocarbons (TPH) as gasoline and as diesel fuel.

- Drilled and sampled six soil borings to identify and delineate hydrocarbon content of the vadose zone (Plate 2)
- Analyzed soil samples for BTEX and TPH as gasoline
- Gauged water levels and estimated the direction of groundwater flow
- Performed slug tests on MW-8C and MW-8E to estimate hydraulic conductivity
- Submitted an Environmental Assessment Report to Texaco during the third quarter 1989.

The results of the soil-gas survey indicated volatile organic compounds in the soil gas near the underground storage tanks and dispenser islands. Analyses on water samples from the four observation wells showed the presence of dissolved petroleum hydrocarbons in groundwater adjacent to the underground tanks.

Table 1 presents the results of groundwater analyses performed since 1988. Notable concentrations of benzene, 5,600 parts per billion [ppb]), were found in water from MW-8E; initially, water from MW-8C contained 5.3 ppb benzene. Subsequent analyses of groundwater from wells MW-8A, MW-8B, and MW-8C indicate either nondetectable hydrocarbon concentrations or concentrations below drinking water action levels (DWALs).

Results from both off-site wells (MW-8F and MW-8G) have shown non-detectable concentrations of petroleum hydrocarbons. Because of insufficient water, MW-8D was not sampled nor was its water level measured; the well was subsequently abandoned in accordance with requirements set forth by Alameda County Flood Control District, Zone 7.

Local groundwater flow is to the south and southeast, toward Lake Merritt (Plate 3). Water-level data from monitoring wells across the site show that the water table fluctuates one to three feet. Data regarding the water level in MW-8A indicated fluctuations as great as 8 feet; those data were not used in contouring the phreatic surface. Slug test data from MW-8C and MW-8E indicate relatively low permeabilities (Table 2) and unconfined aquifer conditions. Groundwater would be expected to move through these soils relatively slowly.

Analyses on soil samples and drill cuttings indicate that the subsurface at the site is composed of clay and minor interbedded clayey sand. Chemical analyses of soils indicate the presence of gasoline hydrocarbons in the vadose zone (from 1 to 7 feet below grade) in B-1, B-3, B-4, and MW-8D (Table 3).

#### ACCOMPLISHMENTS DURING FOURTH QUARTER 1989

During the fourth quarter 1989, HLA continued to monitor groundwater levels and hydrocarbon concentrations in the six monitoring wells at the site. Water from Observation Wells 3 and 4 was sampled and analyzed. Each well was purged while monitoring temperature, conductivity, and pH of the water. The samples were collected using a stainless steel bailer, then decanted into 40-ml volatile organic analysis vials containing HCl as a preservative. The samples were transported, under chain-of-custody, to ChemWest Analytical Laboratories, Inc., in Sacramento,

California, where they were analyzed for BTEX, TPH as gasoline, and TPH as diesel fuel (Table 1 and Plate 4).

Four additional soil borings (B-6, B-7, B-8, and B-9) were drilled on-site to provide additional data regarding hydrocarbons in the vadose zone. The borings, ranging in depth from 3.5 feet to 5.5 feet, were drilled using an 8-inch-diameter, hollow-stem auger. Soil samples were collected by driving a 2.5-inch-diameter, Sprague and Henwood (S&H), split-barrel sampler into the bottom of the boring. The sampler was lined with 6-inch-long stainless steel sampling tubes.

One or two samples per boring were collected and logged in accordance with the Unified Soil Classification System. Each sample was screened for volatile organic compounds, using a photoionization detector (PID); those selected for chemical analysis were sealed, labeled, and stored in an ice chest. The samples were transported under chain-of-custody to Chem-West Analytical Laboratories, Inc., in Sacramento, California, where they were analyzed for BTEX, TPH as diesel fuel, and TPH as gasoline.

Results of the additional soil and water analyses are included in Tables 1 and 3. Water from the tank backfill contains notable hydrocarbon concentrations, (Plate 4). Results of analyses on soil from the four borings indicate that hydrocarbons are present in the vadose zone at the locations at Borings B-7 and B-9 (Plate 5).

In November 1989, HLA submitted a work plan for a supplemental soil and groundwater investigation at the site, which con-

sists of drilling three additional soil borings and installing three monitoring wells on Grand Avenue. The supplemental investigation will allow HLA to refine the site evaluation data and select the most appropriate methods of groundwater and soil remediation. The work plan was submitted to Texaco and approved; it was also approved by the Alameda County Department of Environmental Health, Hazardous Materials Program. Permitting procedures were initiated upon verbal approval of the work plan.

As an interim remedial measure, 5,000 gallons of water were pumped from the tank backfill and disposed of during December.

#### ANTICIPATED ACTIVITIES FOR THE FIRST QUARTER 1990

HLA will implement the work plan for supplemental site investigation as soon as permits are obtained from the City of Oakland and Alameda County. In addition to that investigation, we will measure groundwater levels in all wells monthly, and conduct quarterly sampling and chemical analyses of the groundwater.

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Table 1. Results of Groundwater Analyses  
Concentrations in  $\mu\text{g/l}$  (ppb)

Well	Depth (feet)	Date Sampled	Benzene	Toluene	Ethyl-benzene	Xylenes	TPH as Gasoline	TPH as Diesel
MW-8A	32	06/14/88	<0.5*	1.5	<2	6.6		
		10/28/88	<0.5	<1	<2	<1		
		09/28/89	<0.5	<0.5	<0.5	<3	<50	
		11/29/89	<0.5	1.0	<0.5	<0.5	<50	1,200
MW-8B	20	06/14/88	<0.5	<1	<2	<1		
		10/21/88	<0.5	<1	<2	3.1		
		09/28/89	<0.5	<0.5	<0.5	<3	<50	
		11/29/89	<0.5	<0.5	<0.5	<0.5	<50	<50
MW-8C	24.5	06/14/88	5.3	3.5	2.6	13.0		
		10/21/88	<0.5	<1	<2	<1		
		09/28/89	<0.5	<0.5	<0.5	<3.0	<50	
		11/29/89	<0.5	<0.5	<0.5	<0.5	<50	<50
MW-8E	20	10/25/88	1,400	510	2.9	420		
		09/28/89	5,600	3,100	<500	<3,000	22,000	
		11/29/89	4,900	2,600	<250	1,490	15,000	6,800
MW-8F	16.5	04/14/89	<0.5	<1	<2	<1		
		09/28/89	<0.5	<0.5	<0.5	<3	<50	
		11/29/89	<0.5	<0.5	<0.5	<0.5	<50	<50
MW-8G	16.5	04/14/89	<0.5	<1	<2	<1		
		09/28/89	<0.5	<0.5	<0.5	<3	<50	
		11/29/89	<0.5	<0.5	<0.5	<0.5	<50	<50
jp3 OB-3	11.5	11/06/89	420	8	6	64	4,000	
OB-4	10.0	11/06/89	500	11	10	24	4,000	
DWAL			1.0	680	100	1,750		

DWAL = Drinking water action levels, State of California Department of Health Services (April, 1989).

\* <0.5 indicates that concentrations are below the reporting limit of 0.5  $\mu\text{g/l}$ .

Table 2. Slug Test Results

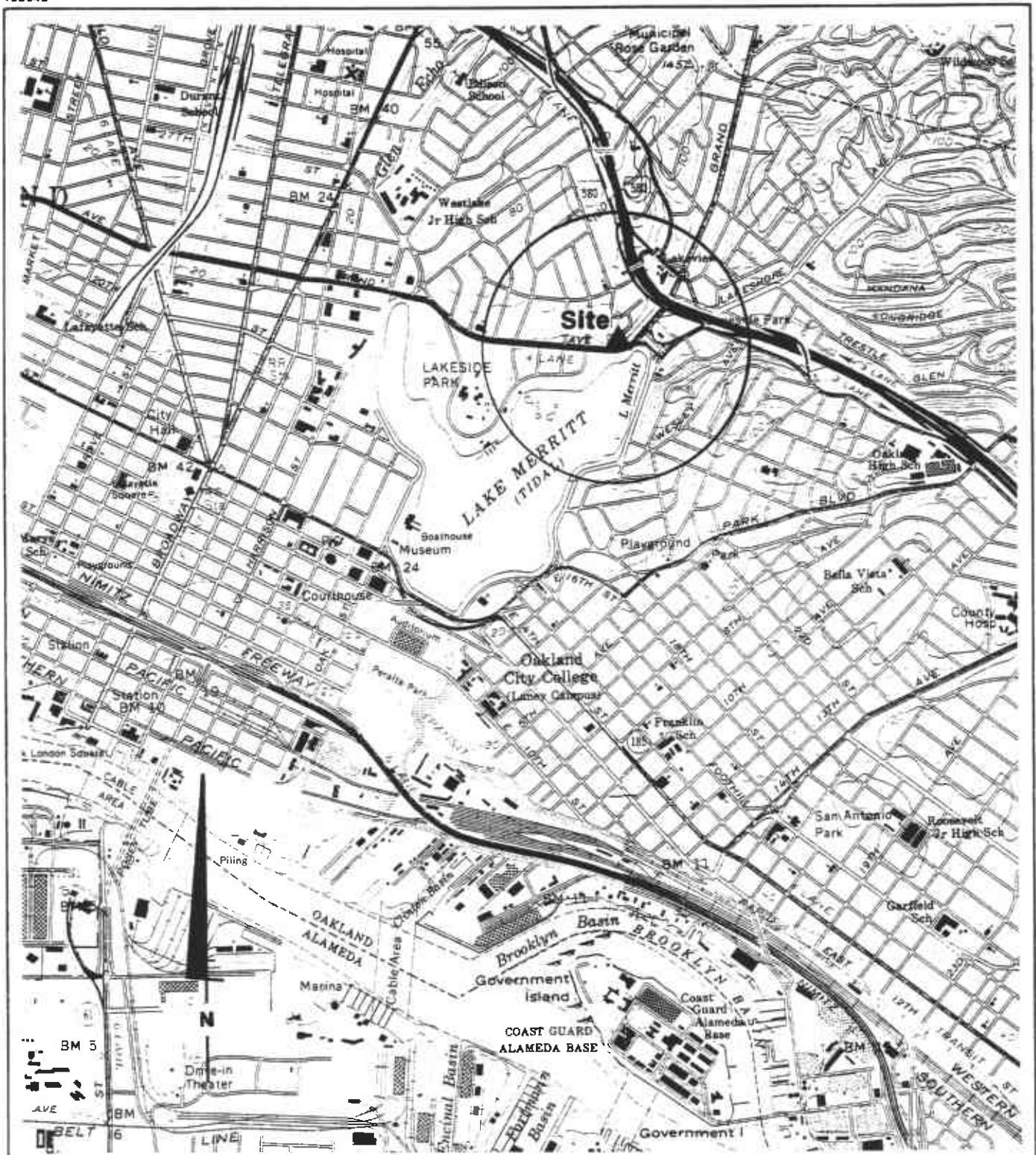
<u>Well Number</u>	<u>Lithology of Tested Soils</u>	<u>Thickness of Tested Soils (feet)</u>	<u>Estimated Hydraulic Conductivity of Tested Soils (feet/day)</u>
MW-8C	Silty clay	13	0.03
MW-8E	Sandy clay, clayey sand	11.5	0.02

Table 3. Results of Soil Sample Analyses  
(concentrations in mg/kg [ppm])

<u>Boring/ Well Number</u>	<u>Sample Depth (feet)</u>	<u>Benzene</u>	<u>Toluene</u>	<u>Ethyl-benzene</u>	<u>Xylenes</u>	<u>TPH (gasoline)</u>	<u>TPH (diesel)</u>
B-1	6.5	<0.05*	<0.1	<0.2	<0.1	12	
B-3	4.0	<1	<2	<4	5	520	
B-4	3.5	<0.5	1	3.5	13	510	
B-5	5.5	<0.05	<0.1	<0.2	<0.1	<10	
B-5	10.5	<0.05	<0.1	<0.2	<0.1	<10	
B-5	16	<0.05	<0.1	<0.2	<0.1	<10	
B-6	2.0	<0.05	0.08	<0.05	<0.05	1.0	<100**
B-6	4.5	<0.05	0.09	<0.05	<0.05	<1.0	<10
B-7	3.0	<0.5	6.7	5.1	50	580	<100**
B-8	2.0	0.05	<0.05	<0.05	0.34	3.4	<10
B-9	2.5	0.05	0.32	0.81	6.4	100	460
MW-8D	1.3	<0.05	0.40	<0.20	0.50	10	
MW-8E	5.5	0.82	6.5	5.5	26	750	
MW-8F	11	<0.5	<0.1	<0.2	<0.1	<10	
MW-8G	6	<0.5	<0.1	<0.2	<0.1	<10	

\* <0.05 indicates that concentrations are below the reporting limit of 0.05 mg/kg.

\*\* Laboratory increased reporting limits because of matrix interference



Ref: USGS, 7.5 Minute  
 Topographic Map, Oakland  
 West, California, Photo  
 revised 1980.



**Harding Lawson Associates**  
 Engineers and Geoscientists

**Regional Map**  
 Former Texaco Service Station  
 500 Grand Avenue  
 Oakland, California

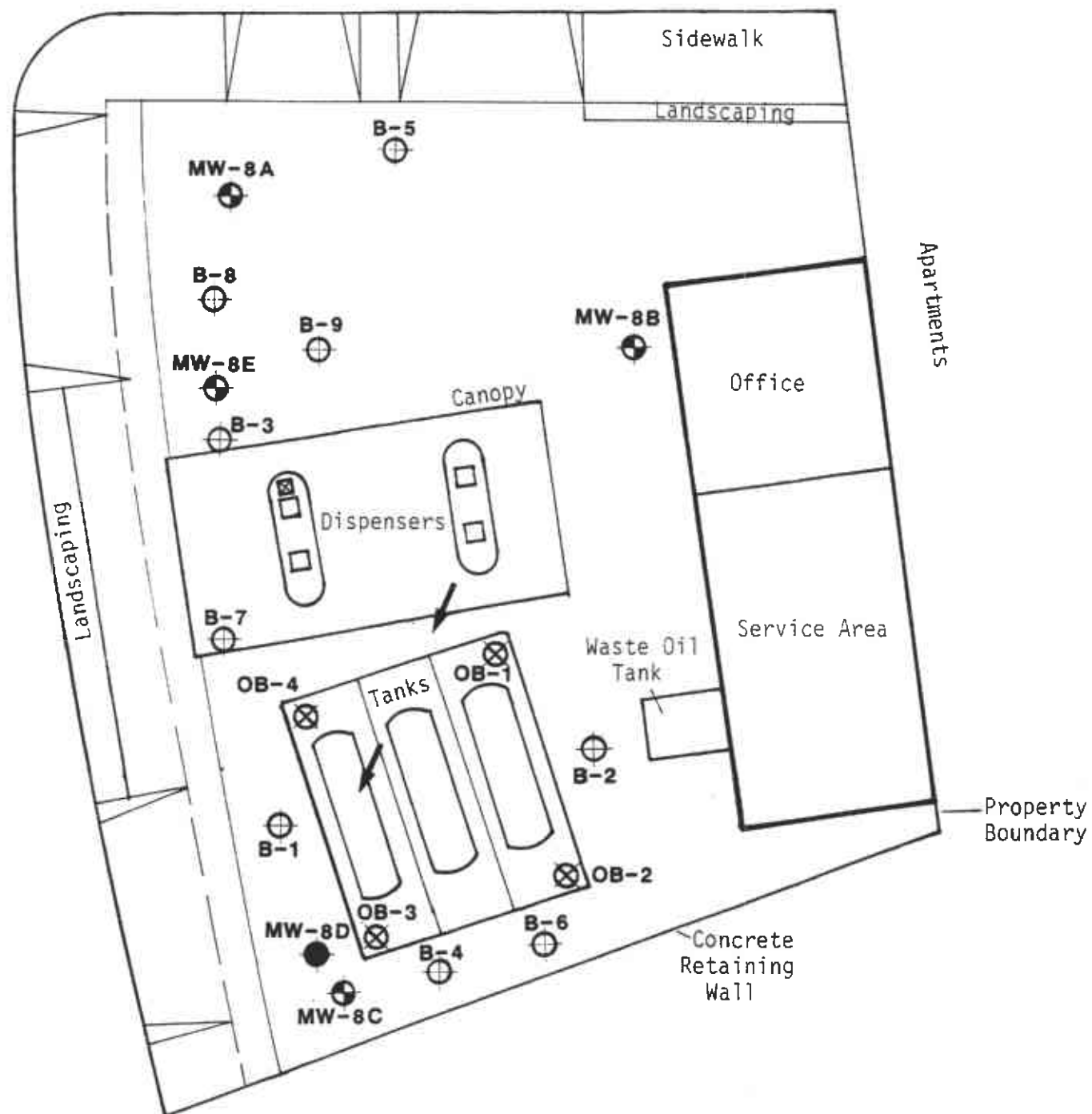
PLATE  
**1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
YC	2251,081.03	AK	5/89		



EUCLID AVENUE

GRAND AVENUE



**LEGEND**

- Monitoring well
- Observation well
- Soil boring
- Abandoned monitoring well
- Ground-water flow direction
- Bench mark (HLA datum e.l.=100 feet)



**Harding Lawson Associates**  
Engineering and  
Environmental Services

DRAWN      JOB NUMBER  
YC      2251,081.03

**Site Plan**  
Former Texaco Station  
500 Grand Avenue  
Oakland, California

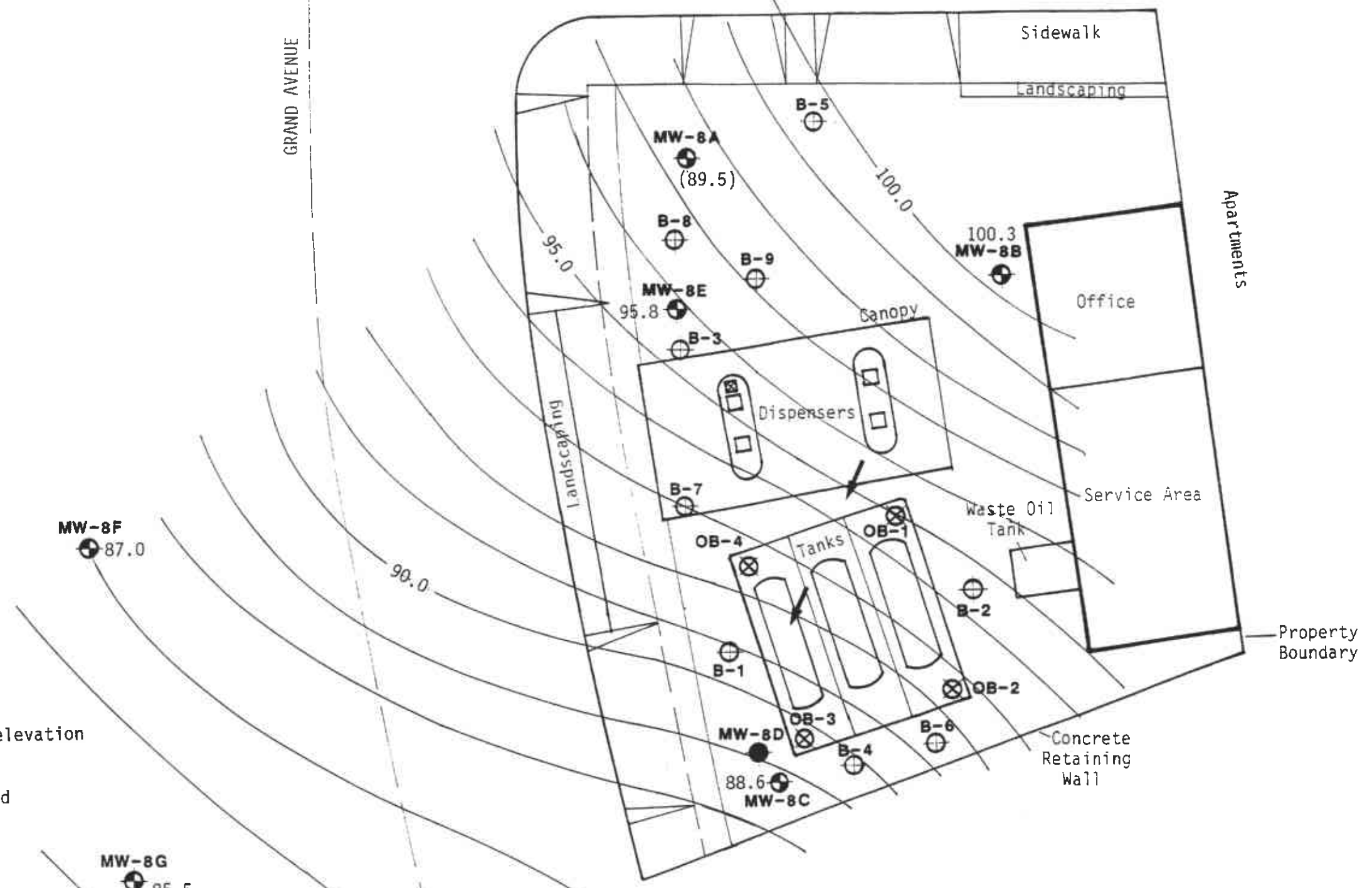
APPROVED      DATE  
JSH      12/89

PLATE  
**2**  
REVISED DATE



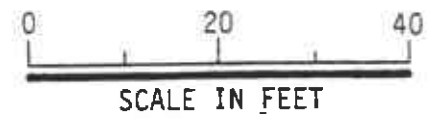
EUCLID AVENUE

GRAND AVENUE



**LEGEND**

- Monitoring well
- 100.0 Relative ground-water elevation as of 12/26/89
- (89.5) Data point not contoured
- Observation well
- Soil boring
- Abandoned monitoring well
- Ground-water flow direction
- Bench mark (HLA datum el. ≈ 100 feet)



**Harding Lawson Associates**  
 Engineering and Environmental Services

**Phreatic Surface - December 1989**  
 Former Texaco Station  
 500 Grand Avenue  
 Oakland, California

PLATE  
**3**

DRAWN YC  
 JOB NUMBER 2251,081.03

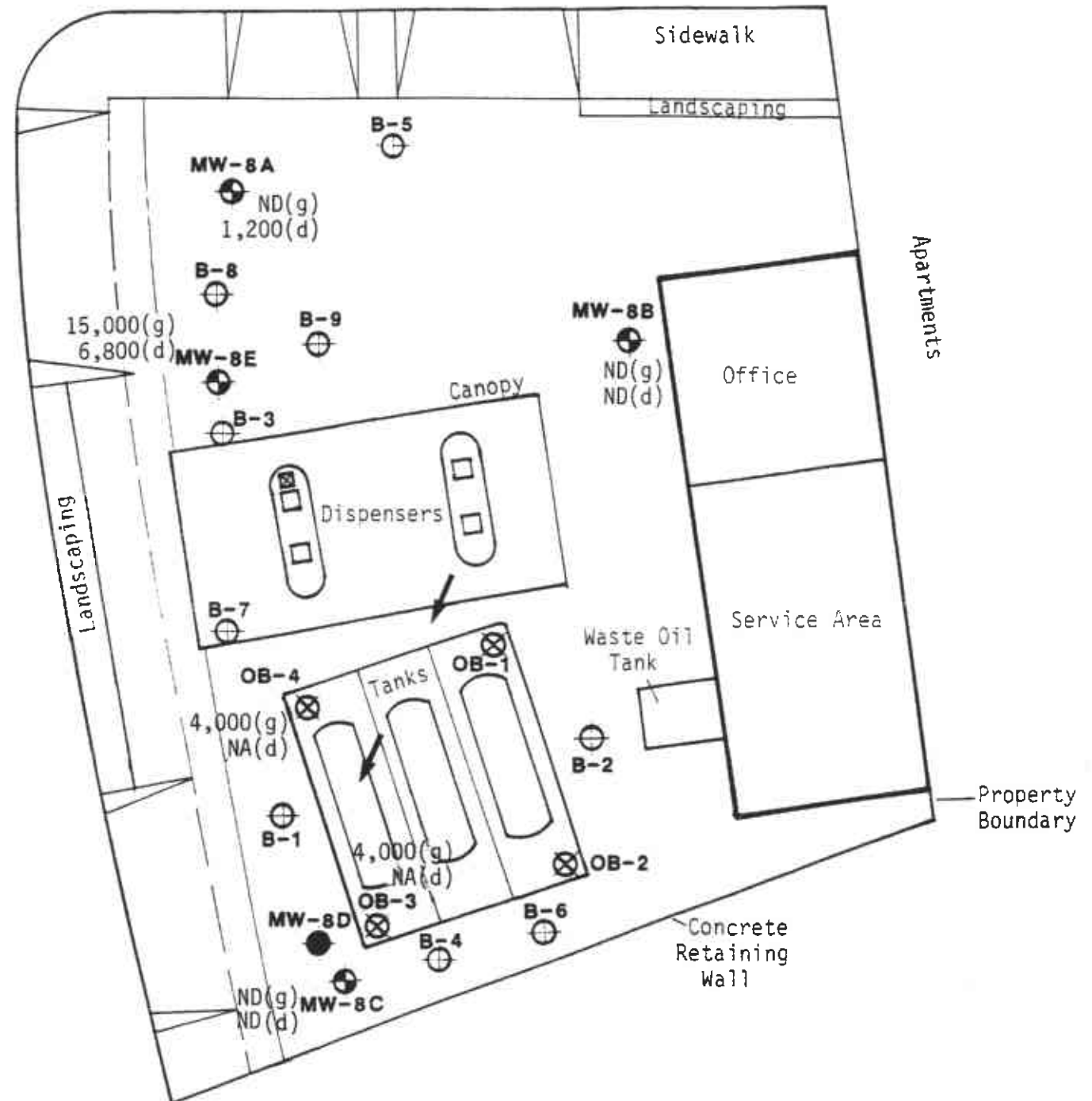
APPROVED  
 JSH

DATE 12/89  
 REVISED DATE



EUCLID AVENUE

GRAND AVENUE

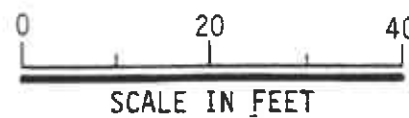


MW-8F  
ND(g)  
ND(d)

MW-8G  
ND(g)  
ND(d)

**LEGEND**

- Monitoring well
- 4000(g) TPH concentration as gasoline (g)
- 40(d) and diesel (d) in parts per billion
- ND Not detected
- NA Not analyzed
- Observation well
- Soil boring
- Abandoned monitoring well
- Ground-water flow direction
- Bench mark (HLA datum el.=100 feet)



**Harding Lawson Associates**  
Engineering and  
Environmental Services

**Hydrocarbon Concentrations in Ground Water**  
Former Texaco Station (11/29/89)  
500 Grand Avenue  
Oakland, California

PLATE

**4**

DRAWN YC  
JOB NUMBER 2251,081.03

APPROVED JSH

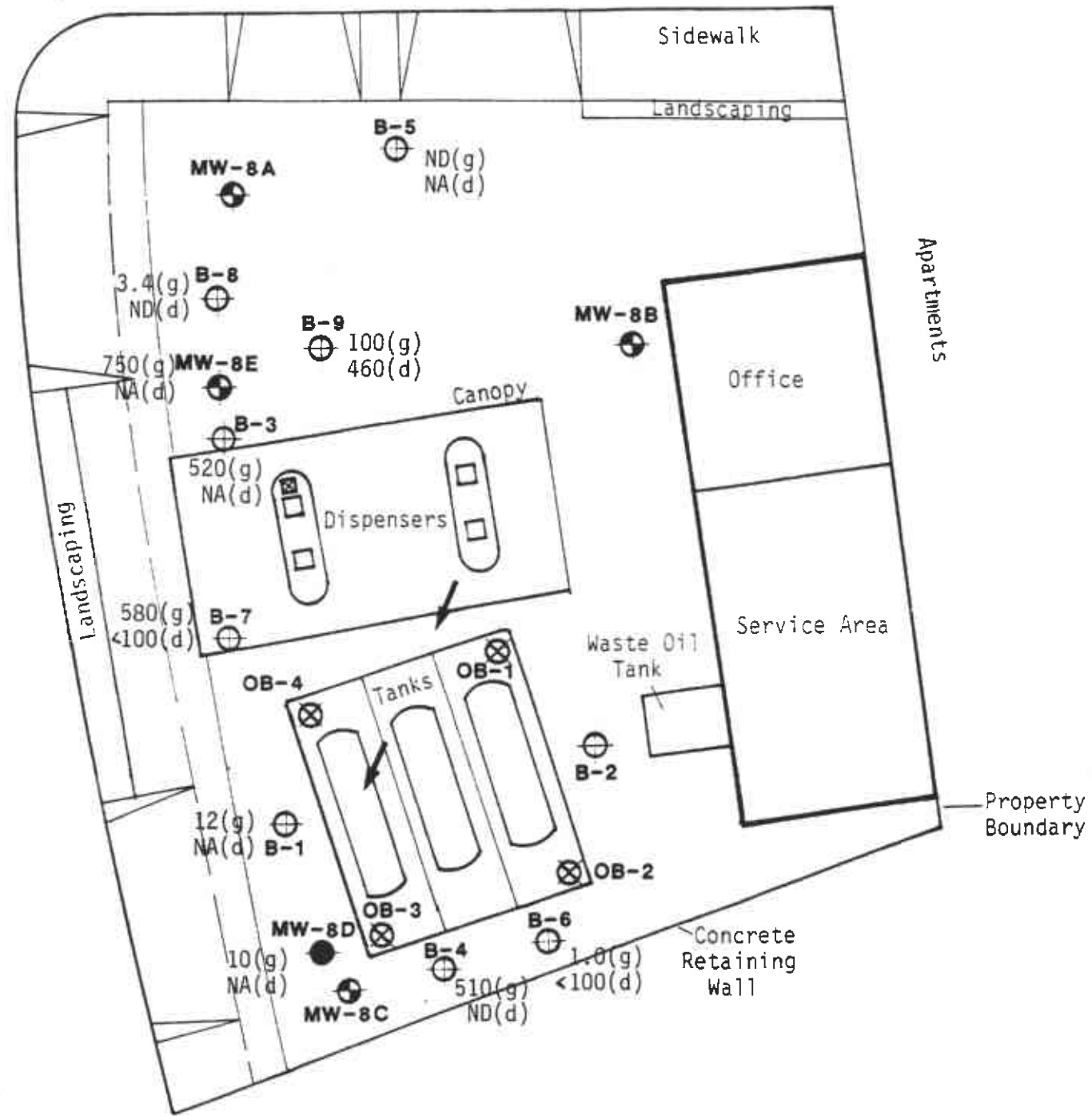
DATE 12/89

REVISED DATE



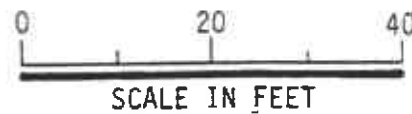
EUCLID AVENUE

GRAND AVENUE



**LEGEND**

- Monitoring well
- 750(g) TPH concentration as gasoline (g)
- 200(d) and diesel (d) in parts per million
- ND Not detected
- NA Not analyzed
- Observation well
- Soil boring
- Abandoned monitoring well
- Ground-water flow direction
- Bench mark (HLA datum el.=100 feet)



**Harding Lawson Associates**  
 Engineering and  
 Environmental Services

**Hydrocarbon Concentrations in the Vadose Zone**  
 former Texaco Station  
 500 Grand Avenue  
 Oakland, California

PLATE  
**5**

DRAWN YC  
 JOB NUMBER 2251,081.03

APPROVED  
 JSH

DATE 12/89

REVISED DATE



DISTRIBUTION

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Richmond, California 94804

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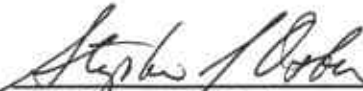
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Universal City, California 91608

Attention: Mr. Robert Robles

JSH/RS/pkp 031241M/R35

QUALITY CONTROL REVIEWER

  
\_\_\_\_\_  
Stephen J. Osborne  
Civil Engineer