

Report Prepared for

Shell Oil Company
P.O. Box 4023
Concord, California 94524

QUARTERLY TECHNICAL REPORT
FOURTH QUARTER OF 1990
SHELL SERVICE STATION
5755 BROADWAY
OAKLAND, CALIFORNIA

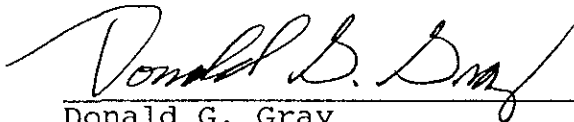
LOP 3618

HLA Job No. 4022,218.03

by



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INTRODUCTION

This Quarterly Technical Report (QTR) describes the status of our continuing evaluation of the presence of petroleum hydrocarbons in soil and groundwater in the vicinity of the Shell Oil Company (Shell) service station at 5755 Broadway, Oakland, California (Plate 1). This report discusses the site history and investigation progress through the fourth quarter of 1990, and summarizes activities we plan to undertake in the first quarter of 1991.

SITE HISTORY

HLA understands that this facility was previously a Thrifty service station prior to 1972 when Shell leased the parcel for their current facilities, which consist of three underground storage tanks (USTs), four canopy covered dispenser islands and a combined office building and cashier booth (Plate 2). The USTs, each of 10,000 gallon capacity and double-wall fiberglass construction, were installed in late 1985 and are currently used for the storage of either regular leaded, unleaded, or super unleaded gasoline.

In July 1985, Gettler-Ryan Inc. (GRI) installed one soil boring (S-A) and one 4-inch monitoring well (S-1) on site to approximately 12 feet. Boring logs, well construction details, and previous analytical reports were presented in a letter from EMCON Associates (subcontractor to GRI) dated August 1, 1985.

Low concentrations of up to 3 parts per million (ppm) of total petroleum hydrocarbons (TPH) as gasoline (Table 1) were detected in soil from borings S-A and S-1 and in groundwater samples from S-1 (Table 2). A soil sample obtained from S-A at the maximum depth explored, 10 to 11.5 feet below grade, did not contain detectable concentrations of TPH as gasoline. These data indicated the presence of petroleum hydrocarbons in the soil and groundwater on site.

On August 10, 1989, Shell retained Harding Lawson Associates (HLA) to complete the site assessment and evaluate the need for remediation. On August 15, 1989, HLA obtained a groundwater sample from S-1. That sample contained concentrations of TPH as gasoline and benzene (Table 2) in respective concentrations of 170 and 0.6 parts per billion (ppb).

On September 18, HLA drilled two soil borings, S-2 and S-3. Drilling was performed under the direction of an HLA field engineer, who obtained soil samples and converted the borings to groundwater monitoring wells as outlined in HLA's work plan dated October 13, 1989. Results of analyses on soil and groundwater samples are summarized in Tables 1 and 2, respectively.

ACCOMPLISHMENTS DURING THE FOURTH QUARTER OF 1990

Groundwater Sampling

On October 17, 1990, HLA collected groundwater samples from S-1 through S-3. Before sampling water from the monitoring

wells, at least three casing volumes of water were purged from the well while monitoring temperature, pH, and conductivity. After these parameters stabilized, groundwater samples were collected with a clean stainless steel bailer, and decanted directly into laboratory-prepared volatile organic analysis (VOA) vials. The samples were labeled and placed into an ice-chilled cooler for transportation, under chain-of-custody, to a state-certified chemical testing laboratory. Samples were analyzed for TPH as gasoline and for benzene, toluene, ethylbenzene, and total xylenes (BTEX). Between wells, all purging and sampling equipment was cleaned with an Alconox solution and rinsed with deionized water.

Chemical Test Results

The results of chemical analyses on groundwater samples (Table 2) indicate the presence of 320 ppb TPH as gasoline and 44 ppb benzene in S-2, and 0.99 ppb benzene in S-1. The water sample from S-3 showed non-detectable concentrations of all compounds tested. Data suggest that the concentrations of TPH as gasoline and benzene in water from S-1 and S-2 have decreased from previous quarters.

Groundwater Gradient

The tops of well casings were surveyed to a temporary datum with an assigned elevation of 100.00 feet. Water-level measurements were obtained using a chalked steel tape accurate to 0.01 feet. Well survey and water-level data are presented in

Table 3. Our calculations indicate that the direction of the hydraulic gradient is toward the south.

ANTICIPATED ACTIVITIES FOR THE FIRST QUARTER 1991

HLA plans to perform the following tasks in the first quarter of 1991:

- Measure water levels and check for free product in each of the three existing on-site monitoring wells.
- Obtain groundwater samples from on-site monitoring wells and analyze them for the presence of BTEX and TPH as gasoline.

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TABLES

Table 1. Summary of Analyses on Soil Samples

<u>Sample Number</u>	<u>Depth (ft)</u>	<u>Sample Date</u>	<u>TPH as Gasoline (ppm)</u>	<u>Benzene (ppm)</u>	<u>Toluene (ppm)</u>	<u>Ethyl-benzene (ppm)</u>	<u>Xylenes (ppm)</u>	<u>Volatile Hydrocarbons Due to Gasoline</u>
S-A*	5.5	06/12/85	--	--	--	--	--	3
S-A*	10	06/12/85	--	--	--	--	--	2
S-A*	11.5	06/12/85	--	--	--	--	--	ND
S-2-1	3.0	09/18/89	92	.120	.800	.580	4.20	--
S-3-1	3.0	09/18/89	ND (.10)	ND (.025)	.062 (.025)	ND (.025)	.120	--

Reporting Limits in parentheses

ND = Not detected

TPH = Total petroleum hydrocarbons

* From GRI report dated 08/01/85

-- Not Tested

Table 2. Summary of Analyses on Groundwater Samples

Well Number	Sample Date	TPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	Xylenes and Ethyl-benzene (ppb)
S-1	07/03/85*	2,400	240	9.8	--	--	380
	08/15/89	170	0.6	ND (.5)	ND (1.5)	ND (1.5)	--
	11/13/89	90	1.2	ND (.5)	ND (1.5)	ND (1.5)	--
	01/18/90	ND (50)	57	3.1	5.7	10	--
	04/11/90	520	120	2.2	.44	6.0	--
	07/27/90	ND (30)	2.7	0.31	ND (.3)	0.47	--
	10/17/90	ND (30)	0.99	ND (.3)	ND (.3)	ND (.3)	--
S-2	09/22/89	260	15	2	1	13	--
	11/13/89	910	64	5.8	13	84	--
	01/18/90	1,100	74	5.6	13	45	--
	04/11/90	2,900	510	6.5	29	120	--
	07/27/90	700	210	2.5	18	33	--
	10/17/90	320	44	0.75	7.9	4.6	--
S-3	09/22/89	ND (50)	ND (.5)	ND (.5)	ND (1.5)	ND (1.5)	--
	11/13/89	ND (50)	ND (.5)	ND (.5)	ND (1.5)	ND (1.5)	--
	01/18/90	ND (50)	ND (.5)	ND (.5)	ND (.5)	ND (.5)	--
	04/11/90	ND (30)	ND (.3)	ND (.3)	ND (.3)	ND (.3)	--
	07/27/90	ND (30)	ND (.3)	ND (.3)	ND (.3)	ND (.3)	--
	10/17/90	ND (30)	ND (.3)	ND (.3)	ND (.3)	ND (.3)	--

Reporting limits in parentheses

ND = Not Detected

TPH = Total petroleum hydrocarbons

* From GRI report dated 08/01/85

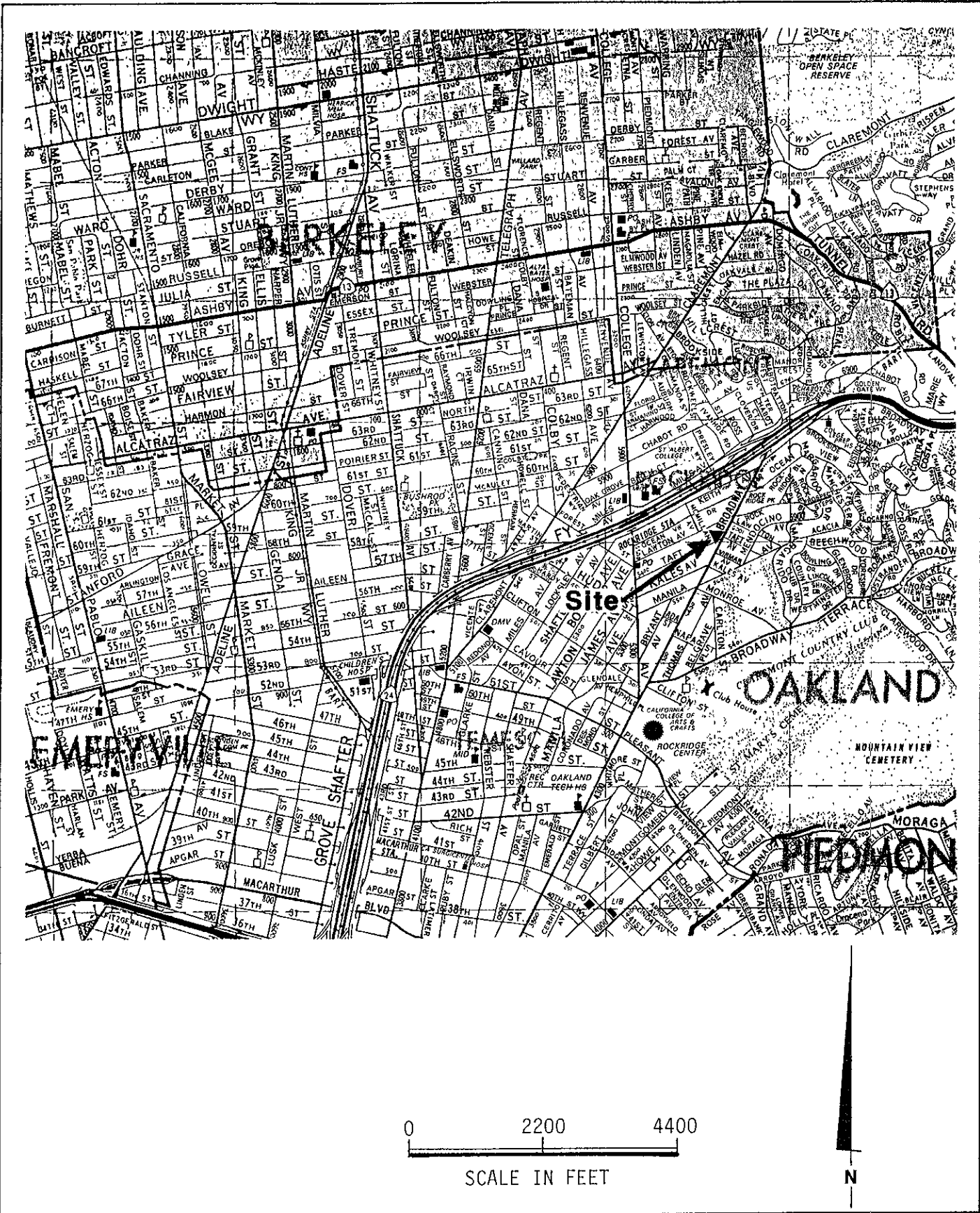
-- Not Tested

Table 3. Well-survey and Water-level Data

<u>Well Number</u>	<u>Date</u>	<u>Top of Casing (feet)</u>	<u>Depth to Groundwater (feet)</u>	<u>Relative Groundwater Elevation (feet)</u>
S-1	10/05/89	*100.00	3.80	96.20
	11/13/89		3.72	96.12
	01/18/90		2.87	97.13
	02/20/90		2.71	97.29
	04/11/90		3.36	96.64
	07/27/90		3.60	96.40
	10/17/90		4.09	95.91
	S-2	10/05/89	98.92	4.44
11/13/89			4.44	94.48
01/18/90			3.41	95.51
02/20/90			3.19	95.73
04/11/90			3.94	94.98
07/27/90			4.13	94.79
10/17/90			4.57	94.35
S-3		10/05/89	101.67	3.97
	11/13/89		3.76	97.91
	01/18/90		2.43	99.24
	02/20/90		2.27	99.40
	04/11/90		2.88	98.79
	07/27/90		3.55	98.12
	10/17/90		4.29	97.38

* Temporary datum of 100.00 feet assigned to top-of-casing at well number S-1

ILLUSTRATIONS



Harding Lawson Associates
 Engineering and
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Vicinity Map
 Shell Service Station
 5755 Broadway
 Oakland, California

PLATE

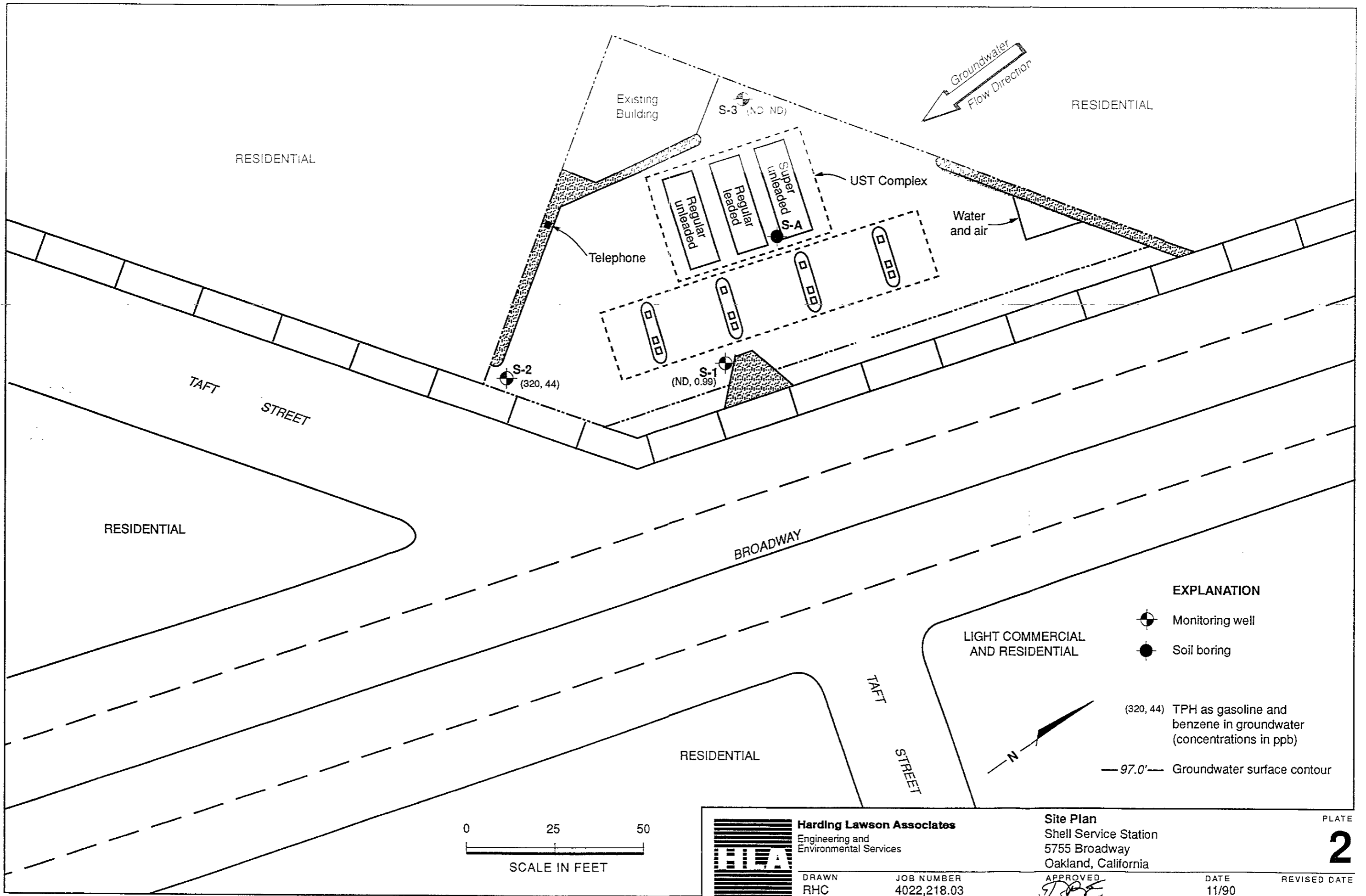
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DRAWN KH
 JOB NUMBER 4022,218.03

APPROVED
[Signature]

DATE 8/89

REVISED DATE



RESIDENTIAL

Existing Building

S-3 (ND ND)

Groundwater Flow Direction

RESIDENTIAL

UST Complex

Water and air

Telephone

Regular unleaded

Regular leaded

Superleaded S-A

S-2 (320, 44)

S-1 (ND, 0.99)

TAFT STREET

BROADWAY

RESIDENTIAL

LIGHT COMMERCIAL AND RESIDENTIAL

RESIDENTIAL

TAFT STREET

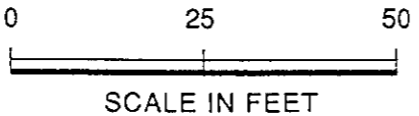
EXPLANATION

Monitoring well

Soil boring

(320, 44) TPH as gasoline and benzene in groundwater (concentrations in ppb)

— 97.0' — Groundwater surface contour



Harding Lawson Associates
Engineering and Environmental Services

Site Plan
Shell Service Station
5755 Broadway
Oakland, California

PLATE

2

DRAWN RHC JOB NUMBER 4022,218.03

APPROVED *DBE*

DATE 11/90


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