REPORT OF ACTIVITIES
QUARTER 1, 1990

SHELL OIL COMPANY FACILITY
285 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

Prepared for:

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CEW Project No. 88-44-359-20

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SECTION 1

INTRODUCTION

1.1 BACKGROUND AND OBJECTIVES

This report presents the results of investigative activities conducted by Converse Environmental West (CEW) during Quarter 1, 1990 (Q1/90) for the former Shell Oil Company (Shell) station ("site") at 285 Hegenberger Road, Oakland, California (Drawing 1). This report is prepared to fulfill the quarterly reporting requirements as specified in the Work Plan prepared by CEW dated February 3, 1989 and revised February 10, 1989 and June 12, 1989 for achievement of environmental closure of the site. The Work Plan is on file with the regulatory agencies of jurisdiction.

The site is located on the northeast corner of Hegenberger Road and Leet Drive in Oakland, California (Drawing 1a). The site is approximately 235 feet long by 130 feet wide (Drawing 2). Shell owns and operates a retail fuel sales station on the site.

Available data indicates that soil and groundwater containing petroleum hydrocarbons exist on the property. This condition has been established by preliminary investigations conducted by CEW since 1989. A general description of site conditions is included as Appendix A. A chronological summary of environmental activities conducted at the site is presented in Appendix B.

1.2 SCOPE OF ACTIVITIES

The investigative activities conducted during Q1/90 were authorized under an existing purchase order and blanket number from Shell for environmental services at the facility. The work initiated and completed by CEW during Q1/90 consisted of the following:

- Collecting and sampling groundwater from monitoring wells MW-1 through MW-10.

- Surveying offsite locations to expand groundwater investigation.

- Evaluating the findings from the field activities and preparing this report.

Investigative activities conducted at the site to date are summarized in Table 1.

As a consultant to Shell on this project, CEW is contracted to perform specific activities related to acquiring data and information which will lead to the ultimate successful environmental closure of the facility under investigation. CEW's primary obligation is to collect information within proper standard of care and practice, and in accordance with protocols which have been created by CEW and which are on file with the regulatory agencies of jurisdiction. From time to time, because of site-specific conditions or limitations, CEW may find it necessary to deviate from these protocols. Under these conditions, CEW will describe in appropriate reports the rationale and necessities for the deviations which occurred, along with a statement of the possible impact the deviations may have on the data generated.

In interpreting its findings, CEW will follow the scientific method and develop multiple working hypotheses which explain site conditions and findings. CEW will not report and justify these multiple working hypotheses to the regulatory agencies for two principal reasons:

(1) The number of assumptions and limitations that are part of the process are numerous and would require substantial discussion and justification, and

(2) The multiple working hypothesis process is iterative to the time of closure. Cosure documentation will provide a final, best hypothesis that is fully explained.

SECTION 2

REMEDIAL INVESTIGATION

2.1 WORK COMPLETED

Work initiated and completed during Q1/90 followed the task descriptions of the CEW Work Plan dated February 3, 1989 and revised February 10, 1989 and June 12, 1989, the project critical path (Drawing 3) and the CEW protocols on file with the regulatory agencies of jurisdiction. No modifications were made to the revised Work Plan as proposed.

2.1.1 Soil Sampling and Analyses

No new soil borings were installed and no samples were collected during Q1/90. A summary of soil boring information is provided in Table 2. Results of previous soil chemical analyses are presented in Table 3.

The onsite soil pile was sampled on January 26, 1990 for waste characterization and disposal. Final disposition of the soil will be at a permitted Class II or III landfill, following CEW protocols.

2.1.2 Groundwater Sampling and Analyses

Monitoring wells MW-1 through MW-10 were installed in 1989. A summary of well installations is provided in Table 5.

Groundwater samples were collected on January 7 and 8, 1990, from monitoring wells MW-1 through MW-10, following CEW protocols. These samples were submitted to NET Pacific, Inc., a California-certified laboratory in Santa Rosa, California. Samples were analyzed for total petroleum hydrocarbons as gasoline (TPH-g); total petroleum

hydrocarbons as diesel (TPH-d); and benzene, toluene, ethylbenzene and xylenes (BTEX) TPH-g, TPH-d and BTEX, following the recommended analytical methods listed in Table 4. Analytical data for the water samples collected from the monitoring wells are summarized in Table 6. Laboratory reports and chain-of-custody forms from Q1/90 monitoring are provided in Appendix C.

2.1.3 Physical Monitoring Activities

During Q1/90, wells MW-1 through MW-10 were measured once for depth to water table and observed for floating product. A summary of these results is presented in Table 7.

2.2 FINDINGS AND DISCUSSION

2.2.1 Soil

2.2.1.1 Pedology

According to pedologic information from the previous CEW investigations, unsaturated soils from the ground surface to approximately 7 feet below ground surface (bgs) consist of clayey silts to silty clays and local surficial fill. First water was encountered at approximately 9 to 10 feet bgs in February 1990. Saturated soils from approximately 8 feet bgs to 14 feet bgs are predominantly Bay Mud, containing variable, but minor, amounts of gravel and clay.

2.2.1.2 Discussion

No new soil data was obtained during Q1/90. Previous soil analytical results and the subsequent CEW interpretation of petroleum hydrocarbon distribution are summarized in the Report of Activities for Q4/89 (CEW, 1989h). This data will be used to evaluate the

potential for soils containing elevated petroleum hydrocarbon concentrations to act as a contaminant source for groundwater.

2.2.2 Groundwater

2.2.2.1 Physical Parameters

Floating product was not present in the wells monitored during Q1/89.

Petroleum hydrocarbon odors were detected in the wells monitored during Q1/89.

2.2.2.2 Elevation and Gradient

Reported Q1/89

- Water table elevation in February 1989 ranged between 2.80 and 2.34 feet above Mean Sea Level (MSL), with a gradient of 0.007 foot per foot (ft/ft). Highest high water by relict boundary in soil is ~4 feet MSL.

Reported Q2/89

- Water table elevation in May 1989 was approximately 2 feet MSL, with a gradient of 0.013 to 0.03 ft/ft to the southwest.

Reported Q3/89

- Water table elevation in August 1989 was approximately 2 feet MSL, with a gradient of 0.013 to 0.03 ft/ft to the southwest.

Reported Q4/89

- Water table elevation in December 1989 was approximately 2 feet MSL, with a gradient of 0.013 ft/ft to the west-southwest. This gradient flattens to less than 0.008 ft/ft, on the part of the site near the bay waters of San Leandro Creek.

Reported Q1/90

- Water table elevation is February 1990, ranged between approximately 4 and 6 feet MSL (Drawing 4).

2.2.2.3 Results of Chemical Analyses

The following is a list of the principal findings and conclusions from groundwater chemical monitoring at the site. Chemical data are summarized in Table 6; Q1/90 data are shown on Drawings 5 through 10.

Reported Q1/89

- Significant concentrations (>100 parts per million [ppm]) of TPH-g and BTEX were detected in groundwater at the downgradient site boundary.

- Upgradient water quality and lateral water quality have not been established. Further onsite investigation is needed to define onsite water quality.

Reported Q2/89

- Significant concentrations (>100 ppm) of TPH-g and BTEX were detected in groundwater at the downgradient site boundary.

- Upgradient water quality and lateral water quality have not been established. Further onsite investigation is needed to define onsite water quality.

- TPH-g in groundwater shows an anomaly possibly centered on the tanks, and extending offsite to the southeast (downgradient).

- The TPH-d plume mimics the TPH-g plume, and extends offsite.

- Benzene in groundwater is present locally in concentrations exceeding 1 ppm, coincident with the TPH-g and TPH-d plumes, and extending offsite.

Reported Q3/89

- TPH-g to TPH-d ratio ranges from 2:1 to 6:1.

- TPH-g and TPH-d concentrations generally increased despite the drop in the groundwater table elevation. This increase may be seasonal and influenced by the lack of flushing action.

- TPH-g in groundwater at well MW-9 may be from a possible offsite unknown source.

- TPH-d in groundwater mimics the TPH-g plume and extends offsite.

Reported Q4/89

- TPH-g and BTEX concentrations decreased from Q3/89 to Q4/89 in all wells except MW-7 and MW-9. MW-7 and MW-9 contained the highest concentrations of TPH-g (100 and 88 ppm, respectively) and BTEX of the wells at this property in Q4/89.

- Because MW-7 and MW-9 are upgradient wells, with one foot higher potentiometric surface than that at the Shell tank complex, the source of TPH-g and BTEX in groundwater at wells MW-7 and MW-9 is most likely not from the Shell tanks.

- Varying concentrations of TPH-d were detected in groundwater in the wells except MW-8; TPH-d concentrations mimiced TPH-g concentration. The possible sources for the TPH-d contamination are unknown, but probably not from the Shell tanks for the same argument as cited above for TPH-g and BTEX.

- No floating product was observed in Q4/89.

Reported Q1/90

- TPH-d concentration decreased from Q4/89 to Q1/90 in all wells except MW-2.

- Samples from MW-7 contained the highest concentration of TPH-g, benzene, ethylbenzene and xylenes (96 ppm, 15 ppm, 2.5 ppm and 14 ppm, respectively.

- MW-10 water samples contained the highest concentrations of benzene (17.0 ppm), and MW-1 water samples contained the highest concentrations of TPH-d (10 ppm).

2.2.2.4 Discussion

Analytical results of groundwater samples collected from the existing wells have contained detectable levels of chemicals analyzed for three quarters of monitoring. MW-7 and MW-1 have had the highest concentrations of TPH-g and TPH-d, respectively, for three quarters, including Q1/90. MW-10 contained the highest concentration of benzene in Q1/90. MW-10 is located at the south property boundary and has contained detectable levels of petroleum hydrocarbons from possible offsite source(s).

Two wells continued to lack detectable concentrations (ND) of TPH-g, TPH-d and BTEX, completing one year of such conditions. These wells were:

- MW-4 Four quarters ND for all constituents, trace TPH-d once.

MW-8 Four quarters ND for all constituents, trace TPH-d once.

Consequently, Shell plans to reduce the frequency of monitoring at these wells immediately. Effective 1990, Shell will only monitor these wells on a semi-annual basis: during February (Q1) and August (Q3) of each year. The wells and parameters to be monitored on this schedule are:

MW-4:	TPH-g, TPH-d, BTEX
MW-8:	TPH-g, TPH-d, BTEX

The next round of groundwater analytical results for these wells will be reported in Q3/90.

Depth to water and other physical monitoring will continue for all wells on a quarterly basis.

SECTION 3

FEASIBILITY STUDIES

3.1 WORK COMPLETED

Remediation planning with technical option analyses commenced in Q1/90. CEW prepared a detailed Source Area ("hotspot") Removal Plan (SARP) describing methods, techniques and costs with schedule for removing approximately 600 cubic yards of the most strongly contaminated soils located at the site. This plan was submitted to Shell in Q1/90 for review. Shell is currently considering non-disposal options for offsite treatment of contaminated soil, provided that such treatment is conducted by a properly licensed facility. Once treatment disposal options are fully reviewed, Shell will submit a final SARP to the Regional Water Quality Control Board (RWQCB) for review prior to implementation.

3.2 FUTURE REMEDIAL ACTIVITIES

3.2.1 Source Area Removal Plan

The SARP will be finalized and submitted to the LIA and the RWQCB before soil removal activities are performed. This letter will specify in detail the extent of the excavation, the treatment and disposal methods for the soil, the sampling plan, the verification plan, and the schedule for activities.

3.2.2 Soil Removal Activities

Once Shell authorizes work and the SARP is approved by the LIA and RWQCB, CEW will manage the excavation, removal, treatment and disposal of selected "hotspot" soils at the site. The City of Oakland and the Bay Area Air Quality Management District

BAAQMD will be fully informed of intended activities, and will receive copies of the plans to proceed.

Principal soil removal activities will include:

a) Identifying lateral and vertical extent of the proposed excavation(s), and the volume of soil to be removed,
b) Identifying the transporter of soil including licensee,
c) Identifying the proposed location for offsite biotreatment,
d) Supplying transport records and a chain-of-custody form for the soil from Shell to the owner/operator of the offsite treatment facility,
e) Providing onsite analytical laboratory capability for use in directing the excavation process to proper dimensions and limits, and
f) Collecting and analyzing verification samples, as appropriate.

SECTION 4

NEXT QUARTER ACTIVITIES

4.1 WORK PLAN MODIFICATIONS

Based on the information collected to date, two modifications to the Work Plan are proposed for Q2/90:

4.1.1 Monitoring

Shell will decrease groundwater chemical monitoring of two wells (MW-4 and MW-8) to a semi-annual schedule, as described in Section 2.2.2.4. only if RWQCB agrees

4.1.2 Excavation and Disposal of Soil

The central "hotspot" parts of the soil plume(s) will be excavated, treated and disposed of during Q2/90 and Q3/90, according to CEW protocols and following the activities stated in Section 3.2.2 of this report.

4.2 PROPOSED ACTIVITIES

The following activities will be conducted in Q2/90 and Q3/90:

(1) Continue monitoring groundwater conditions, with modifications as discussed in Section 2.2.2.4 of this report.

(2) Expand remedial investigation offsite.

(3) Continue detailed cost and technical analyses and support for Shell to proceed with source area soils excavation activities.

CERTIFICATION

This report of activities for the Shell Oil Company facility at 285 Hegenberger Road, Oakland, California has been prepared by the staff of **Converse Environmental West** under the professional supervision of the Engineer and/or Geologist whose seal(s) and signature(s) appear hereon.

The findings, recommendations, specifications or professional opinions are presented, within the limits prescribed by the Client, after being prepared in accordance with generally accepted professional engineering and geologic practice. We make no other warranty, either expressed or implied.

Respectfully submitted,

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285 Hegenberger Road
Oakland, California

Quarter 1, 1990

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Site Owner:	Shell Oil Company

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CEW - see Converse Environmental West

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TABLE 1. ACTIVITY SUMMARY - QUARTER 1, 1990

Shell Oil Company Facility
285 Hegenberger Road
Oakland, California

PERCENT COMPLETE

Activity	Quarter 1, 1990		Total to Date	
	Onsite	Offsite	Onsite	Offsite
Soil Characterization	50	0	50	0
Groundwater Characterization (Dissolved Product)	70	0	70	0
Groundwater Characterization (Floating Product)	NA	NA	NA	NA
Soil Remediation	0	0	0	0
Groundwater Remediation (Dissolved Product)	0	0	0	0
Groundwater Remediation (Floating Product)	NA	NA	NA	NA

NOTES:

NA Not Applicable

TABLE 2. SOIL BORING INFORMATION

Shell Oil Company Facility
285 Hegenberger Road
Oakland, California

Boring No.	Date Drilled	Total Depth (ft bgs)	Completion	Unsaturated Soil Samples (ft bgs)	Saturated Soil Samples (ft bgs)	Highest OVM Reading (ppm)
SB-1	02/89	6.5	2/89	4	None	NM
SB-2	02/89	6.0	2/89	5	None	NM
SB-3	5/24/89	5.0	5/24/89	2,4	None	1030 @ 3.5'
SB-4	5/24/89	4.0	5/24/89	2,4	None	780 @ 4'
SB-5	5/24/89	5.0	5/24/89	2	None	0
SB-6	7/13/89	7.0	7/13/89	None*	None	200 @ 7'
SB-7	7/13/89	6.0	7/13/89	None*	None	NM
SB-8	7/13/89	6.5	7/13/89	4	None	260 @ 5'
SB-9	7/13/89	7.0	7/13/89	4	None	280 @ 4.5'
SB-10	7/13/89	6.5	7/13/89	4	None	500 @ 3.5'
SB-11	7/13/89	6.5	7/13/89	4	None	280 @ 4.5'
SB-12	11/16/89	9.0	11/16/89	5,7	None	0
SB-13	11/16/89	7.0	11/16/89	5	None	215 @ 5'

NOTES:

* Sample not taken, in underground storage tank gravel backfill
NM Not Measured
ft bgs feet below ground surface
OVM organic vapor meter
ppm part per million

TABLE 3. RESULTS OF SOIL CHEMICAL ANALYSES

Shell Oil Company Facility
285 Hegenberger Road
Oakland, California

Boring No.	Sample Depth (ft bgs)	Date Sampled	Concentration (ppm) TPH-g	TPH-d	Benzene	Toluene	Ethyl-benzene	Xylenes	Lead[1]
SB-1	4.0	2/13/89	140	NA	0.3	0.8	1.4	0.6	14.7
SB-2	5.0	2/13/89	3700	NA	<8	120	110	530	9.17
SB-3	4.0	5/24/89	1300	180	0.54	8.4	18	24	0.2
SB-3	2,4**	5/24/89	250	100	<0.25	1.1	1.9	3.2	<0.2
SB-4	2,4**	5/24/89	1300	12	0.54	0.4	18	24	
SB-4	4.0	5/24/89	50	20	0.12	0.43	0.45	0.18	<0.2
SB-5	2.0	5/24/89	31000	370	4.7	18	66	150	<0.2
SB-8	6.5	7/13/89	1900	360	<0.025	<0.025	25	82	6.2
SB-9	5.0	7/13/89	<10	<10	<0.025	<0.025	<0.075	<0.075	3.9
SB-10	4.5	7/13/89	550	75	2.3	11	13	71	5.8
SB-11	5.0	7/13/89	190	440	3.8	16	5.7	28	17
SB-12	5.0	11/16/89	<1	1.4	<0.0025	<0.0028	<0.0025	<0.0025	4.8
SB-12	7.0	11/16/89	<1	1.4	0.0068	0.046	<0.0025	0.0098	4.6
SB-13	5.0	11/16/89	650	60	1.4	5.2	6.0	25	5.5
MW-1	5.5	2/14/89	1100	NA	12	36	27	120	12.7
MW-2	6.0	2/15/89	2.0	NA	0.1	<0.1	<0.1	<0.1	3.31
MW-3	5.0	2/14/89	3.0	NA	<0.1	<0.1	<0.1	<0.1	1.42
MW-4	5.0	4/28/89	<10	<10	<0.025	<0.025	0.056	<0.075	34
MW-4	10.0	4/28/89	<10	<10	<0.025	0.052	<0.075	<0.075	2.3
MW-5	5.0	4/27/89	<10	<10	<0.025	<0.025	<0.075	<0.075	5.3
MW-5	10.0	4/27/89	<10	<10	<0.025	0.037	<0.075	<0.075	4.3

Notes:
[1] Analysis by EPA Methed 7421
** Composite sample
ft bgs feet below ground surface
MW monitoring well
ppm part per million
SB soil boring
TPH-g Total Petroleum Hydrocarbons as Gasoline (GCFID)
TPH-d Total Petroleum Hydrocarbons as Diesel (GCFID)

TABLE 3 (cont'd). RESULTS OF SOIL CHEMICAL ANALYSES

Shell Oil Company Facility
285 Hegenberger Road
Oakland, California

Boring No.	Sample Depth (ft bgs)	Date Sampled	Concentration (ppm) TPH-g	TPH-d	Benzene	Toluene	Ethyl-benzene	Xylenes	Lead[1]
MW-6	5.0	4/28/89	<10	<10	0.033	0.079	<0.075	<0.075	8.2
MW-6	10.0	4/28/89	<10	<10	<0.025	0.12	<0.075	<0.075	7.0
MW-7	5.0	4/28/89	4100	84	14	92	14	190	14
MW-7	10.0	4/27/89	<10	18	0.11	0.045	<0.075	<0.075	14
MW-8	5.0	4/28/89	<10	<10	<0.025	0.089	<0.075	<0.075	3.4
MW-8	10.0	7/13/89	<10	160	<0.025	0.087	<0.075	<0.075	22
MW-9	5.0	7/13/89	120	<10	1.1	0.64	3.7	0.46	4.1
MW-10	5.0	11/16/89	2.2	1.3	0.23	0.22	0.21	0.61	3.6

Notes:

[1] Analysis by EPA Method 7421
ft bgs feet below ground surface
MW monitoring well
ppm part per million
SB soil boring
TPH-g Total Petroleum Hydrocarbons as Gasoline (GCFID)
TPH-d Total Petroleum Hydrocarbons as Diesel (GCFID)

TABLE 4. RECOMMENDED MIMIMUM VERIFICATION ANALYSES FOR UNDERGROUND TANK LEAKS

From: RWQCB Guidelines for Additional Fuel Tank Leaks (Revised May 18, 1989)

HYDROCARBON LEAK	SOIL ANALYSIS				WATER ANALYSIS			
		Prep	Analysis	D.L. (mg/kg)		Prep	Analysis	D.L. (µg/l)
Unknown Fuel	TPH-g	5030	GCFID	1.0	TPH-g	5030	GCFID	50.0
	TPH-d	3550	GCFID	1.0	TPH-d	3510	GCFID	50.0
	BTEX	5030	8020/8240	0.005	BTEX	5030	602/624	0.50
Leaded Gas	TPH-g	5030	GCFID	1.0	TPH-g	5030	GCFID	50.0
	BTEX	5030	8020/8240	0.005	BTEX	5030	602/624	0.50
	TEL*	---	DHS-LUFT		TEL	---	DHS-LUFT	
	EDB*	---	DHS-AB1803		EDB	---	DHS-AB1803	
Unleaded Gas	TPH-g	5030	GCFID	1.0	TPH-g	5030	GCFID	50.0
	BTEX	5030	8020/8240	0.005	BTEX	5030	602/624	0.50
Diesel	TPH-d	3550	GCFID	1.0	TPH-d	3510	GCFID	50.0
	BTEX	5030	8020/8240	0.005	BTEX	5030	602/624	0.50
Waste Oil or Unknown	TPH-g	5030	GCFID	1.0	TPH-g	5030	GCFID	50.0
	TPH-d	3550	GCFID	1.0	TPH-d	3510	GCFID	50.0
	O&G	---	503D&E	50.0	O&G	---	503A&E	5000.0
	BTEX	5030	8020/8240	1.0	BTEX	5030	602/624	0.50
	CL HC	5030	8010/8240	1.0	CL HC	5030	601/624	0.50
	ICAP or AA for soil or water to detect metals: Cadmium, Chromium, Lead, Zinc							
	Method 8270 for soil or water to detect: PCB, PCP, PNA, Creosote							

NOTES:

*	Optional Analysis
RWQCB	Regional Water Quality Control Board
µg/l	microgram per liter
mg/kg	milligram per kilogram
D.L.	Detection Limit
TPH-g	Total Petroleum Hydrocarbons as Gasoline
TPH-d	Total Petroleum Hydrocarbons as Diesel
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
O & G	Oil and Grease
CL HC	Chlorinated Hydrocarbons
TEL	Tetra Ethyl Lead
EDB	Ethylene Dibromide

TABLE 5. WELL INSTALLATION INFORMATION

Shell Oil Company Facility
285 Hegenberger Road
Oakland, California

Well No.	Date Installed	Well Diameter (inches)	Total Depth of Well (ft bgs)	Screened Interval* (ft bgs)	Bentonite Seal Interval (ft bgs)	Grout Seal Interval (ft bgs)
MW-1	2/14/89	4	16.5	10.0 - 5.5	4.0 - 3.0	3.0 - 0
MW-2	2/15/89	4	16.5	10.0 - 5.5	4.0 - 3.0	3.0 - 0
MW-3	2/15/89	4	16.5	10.0 - 5.5	4.0 - 3.0	3.0 - 0
MW-4	4/28/89	4	14.0	10.0 - 5.5	5.0 - 4.0	4.0 - 0
MW-5	4/27/89	4	14.0	10.0 - 4.5	4.5 - 3.5	3.5 - 0
MW-6	4/28/89	4	12.0	11.0 - 5.0	5.0 - 4.0	4.0 - 0
MW-7	4/27/89	4	14.0	10.0 - 5.0	5.0 - 4.0	4.0 - 0
MW-8	4/28/89	4	12.0	10.0 - 5.0	5.0 - 4.0	4.0 - 0
MW-9	7/13/89	4	10.5	10.0 - 5.0	4.5 - 3.5	3.5 - 0
MW-10	11/16/89	4	13.0	10.0 - 5.0	4.5 - 4.0	4.0 - 0

NOTES:

* bentonite seals were placed from TDs to the base of the screened intervals.
ft bgs feet below ground surface
MW groundwater monitoring well

TABLE 6. RESULTS OF GROUNDWATER CHEMICAL ANALYSES

Shell Oil Company Facility
285 Hegenberger Road
Oakland, California

Well No.	Date Sampled	Concentration (ppm) TPH-g	TPH-d	Benzene	Toluene	Ethyl-Benzene	Xylenes
MW-1	02/16/89	99	NA	20	23	5.7	23
MW-1	05/23/89	48	11	4.2	5.2	1.2	7.7
MW-1	08/04/89	63	11	5.5	5.5	3.2	9.5
MW-1	12/15/89	30	11	<0.0005	<0.0005	<0.0005	<0.0005
MW-1	02/07/90	93	10	130	9.6	2.4	14
MW-2	02/16/89	20	NA	0.2	0.9	2.7	9.6
MW-2	5/23/89	1.5	1.6	0.0043	0.0029	0.011	0.15
MW-2	08/04/89	15	7.4	0.075	0.12	0.85	2.2
MW-2	12/15/89	5.0	2.6	0.052	0.013	0.0041	0.29
MW-2	02/07/90	13	4.8	0.032	0.034	0.23	0.840
MW-3	02/16/89	60	NA	5.5	0.2	3.2	5.2
MW-3	05/23/89	<0.05	1.5	<0.0005	<0.0005	<0.0015	<0.0015
MW-3	08/04/89	2.0	1.2	0.12	0.012	<0.0015	0.086
MW-3	12/15/89	5.2	1.7	0.38	0.047	0.017	0.410
MW-3	03/08/90	0.26	0.23	0.017	<0.0005	0.0054	0.0025
MW-4	05/23/89	<0.05	NA	<0.0005	<0.0005	<0.0015	<0.0015
MW-4*	08/04/89	<0.05	<0.05	<0.0005	<0.0005	<0.0015	<0.0015
MW-4	12/15/89	<0.05	0.09	<0.0005	<0.0005	<0.0005	<0.0005
MW-4	03/08/90	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
MW-5	05/23/89	26	7.0	1.5	0.28	<0.0015	8.1
MW-5	08/04/89	12	8.7	0.86	0.094	<0.0015	2.6
MW-5	12/15/89	1.0	0.71	0.022	0.035	0.018	0.044
MW-5	02/08/90	<0.05	0.62	0.0008	<0.0005	<0.0005	<0.0005
MW-6	05/23/89	22	7.0	0.016	0.0065	0.0066	3.4
MW-6	08/04/89	28	8.8	1.2	0.13	2.1	2.8
MW-6	12/15/89	16	5.5	0.37	0.092	0.20	0.18
MW-6	02/07/90	22	2.6	0.52	0.085	0.68	0.37
MW-7	05/23/89	47	11	3.5	5.0	1.5	7.8
MW-7	08/04/89	68	22	6.2	6.6	3.6	8.8
MW-7	12/15/89	100	12	4.5	5.3	1.3	5.3
MW-7	02/08/90	96	8.1	15	15	2.5	14

NOTES:

*MW-4 Analysis 601 was ND for all compounds.
TPH-g Total Petroleum Hydrocarbons of Gasoline (GCFID)
TPH-d Total Petroleum Hydrocarbons of Diesel (GCFID)
ppm part per million

TABLE 6 (cont'd). RESULTS OF GROUNDWATER CHEMICAL ANALYSES

Shell Oil Company Facility
285 Hegenberger Road
Oakland, California

Well No.	Date Sampled	Concentration (ppm) TPH-g	TPH-d	Benzene	Toluene	Ethyl-Benzene	Xylenes
MW-8	05/23/89	<0.05	0.10	<0.0005	<0.0005	<0.0015	<0.0015
MW-8	08/04/89	<0.05	0.075	<0.0005	<0.0005	<0.0015	<0.0015
MW-8	12/15/89	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
MW-8	03/08/90	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
MW-9	08/04/89	47	12	5.6	6.6	1.5	8.5
MW-9	12/15/89	88	9.2	4.3	5.4	0.14	5.6
MW-9	02/08/90	50	7.4	1.8	1.4	3.2	1.8
MW-10	12/15/89	<0.05	3.1	1.5	<0.0005	<0.0005	<0.0005
MW-10	03/08/90	25	1.8	17	0.330	2.1	1.4

NOTES:

*MW-4 Analysis 601 was ND for all compounds.
TPH-g Total Petroleum Hydrocarbons of Gasoline (GCFID)
TPH-d Total Petroleum Hydrocarbons of Diesel (GCFID)
ppm part per million

TABLE 7. GROUNDWATER MONITORING INFORMATION

Shell Oil Company Facility
285 Hegenberger Road
Oakland, California

Well No.	Date Monitored	Depth to Water (ft bgs)	Petroleum Odor In Water	Floating Product Thickness (inches)	Comments
MW-1 El. 6.64	02/16/89	3.83	Slight	0	----
	05/23/89	3.59	Slight	0	No sheen
	08/03/89	4.04	Slight	0	----
	12/15/89	4.22	Slight	0	----
	02/07/90	4.06	Slight	0	—
MW-2 El. 7.68	02/16/89	5.33	Slight	0	----
	05/23/89	5.23	Slight	0	----
	08/03/89	6.03	Slight	0	----
	12/15/89	6.43	Strong	0	----
	02/07/90	5.82	Slight	0	No sheen
MW-3 El. 7.81	02/16/89	5.17	None	0	----
	05/23/89	5.09	None	0	----
	08/03/89	5.34	Slight	0	----
	12/15/89	6.02	None	0	----
	3/08/90	4.95	Moderate	0	Cloudy
MW-4 El. 7.38	05/23/89	9.60	None	0	----
	08/03/89	6.37	None	0	----
	12/15/89	6.91	Slight	0	----
	3/08/90	6.06	Moderate	0	Greenish
MW-5 El. 8.18	05/23/89	5.47	Moderate	0	No sheen
	08/03/89	5.94	None	0	----
	12/15/89	6.75	None	0	----
	02/07/90	6.03	Slight	0	Clear
MW-6 El. 8.21	05/23/89	5.47	Strong	0	Sheen
	08/03/89	5.91	None	0	----
	12/15/89	5.98	Moderate	0	----
	02/07/90	5.47	Moderate	0	—

NOTES:

ft bgs feet below ground surface
Elevations are in feet above Mean Sea Level

TABLE 7 (cont'd). GROUNDWATER MONITORING INFORMATION

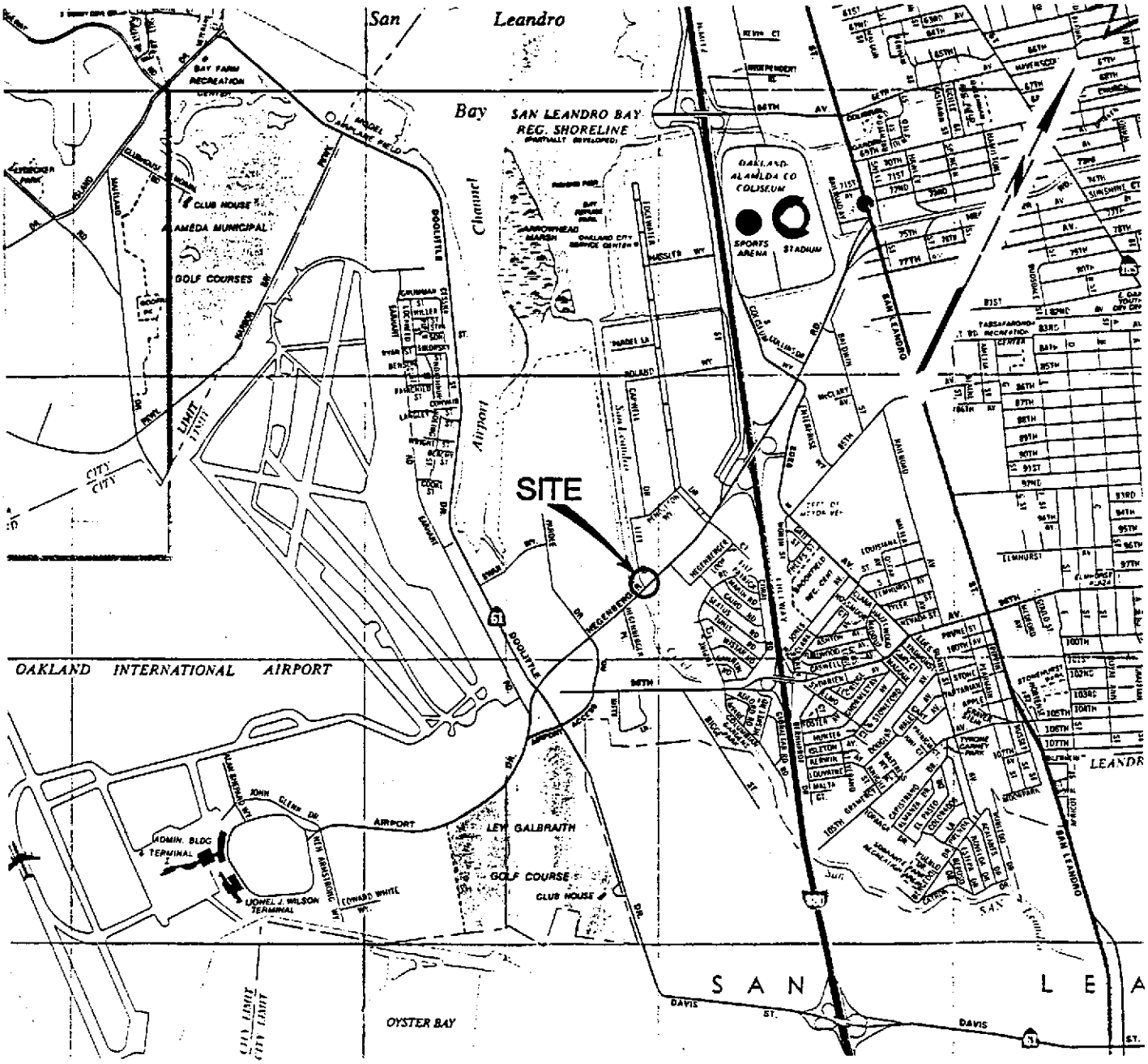
Shell Oil Company Facility
285 Hegenberger Road
Oakland, California

Well No.	Date Monitored	Depth to Water (ft bgs)	Petroleum Odor In Water	Floating Product Thickness (inches)	Comments
MW-7 El. 7.44	05/23/89	5.48	Moderate	0	Slight sheen
	08/03/89	4.22	None	0	----
	12/15/89	4.58	Slight	0	----
	02/07/90	5.34	Slight	0	Brownish
MW-8 El. 7.79	05/23/89	8.62	None	0	----
	08/03/89	6.62	None	0	----
	12/15/89	6.71	None	0	----
	3/08/90	4.95	Moderate	0	Milky
MW-9 El. 7.63	08/03/89	5.78	None	0	----
	12/15/89	5.24	None	0	----
	02/07/90	5.23	Organic Odor	0	Yellow
MW-10 El. 7.45	12/15/89	6.33	None	0	----
	3/08/90	5.41	Strong	0	Clear

NOTES:

ft bgs feet below ground surface
Elevations are in feet above Mean Sea Level

DRAWINGS



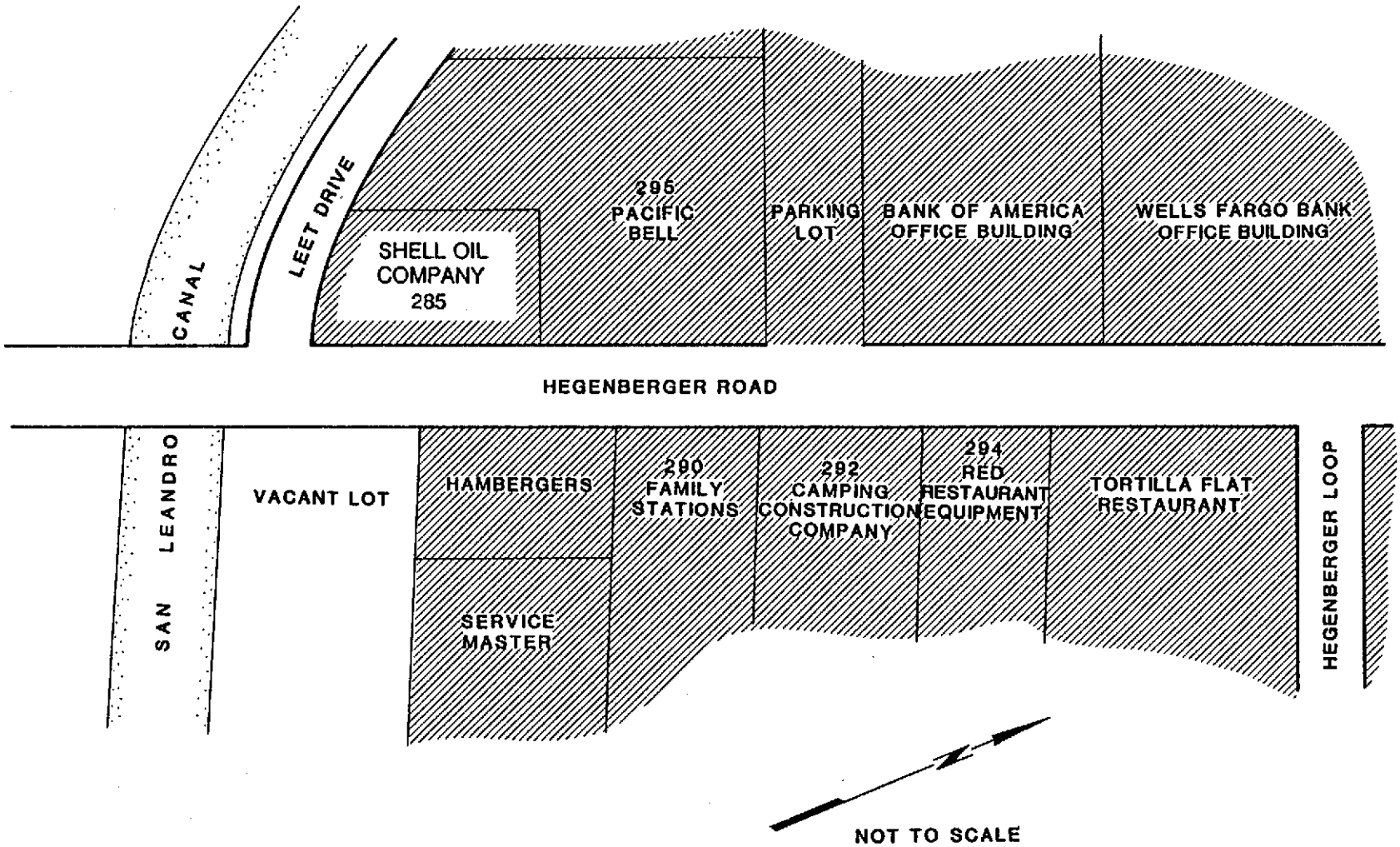
SOURCE: California State Automobile Association

SITE LOCATION

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Prepared by	LQL
Checked by	ABC
Approved by	GLS
Project No.	88-44-359-20
Date	3/28/90
Drawing No.	1



LEGEND

COMMERCIAL

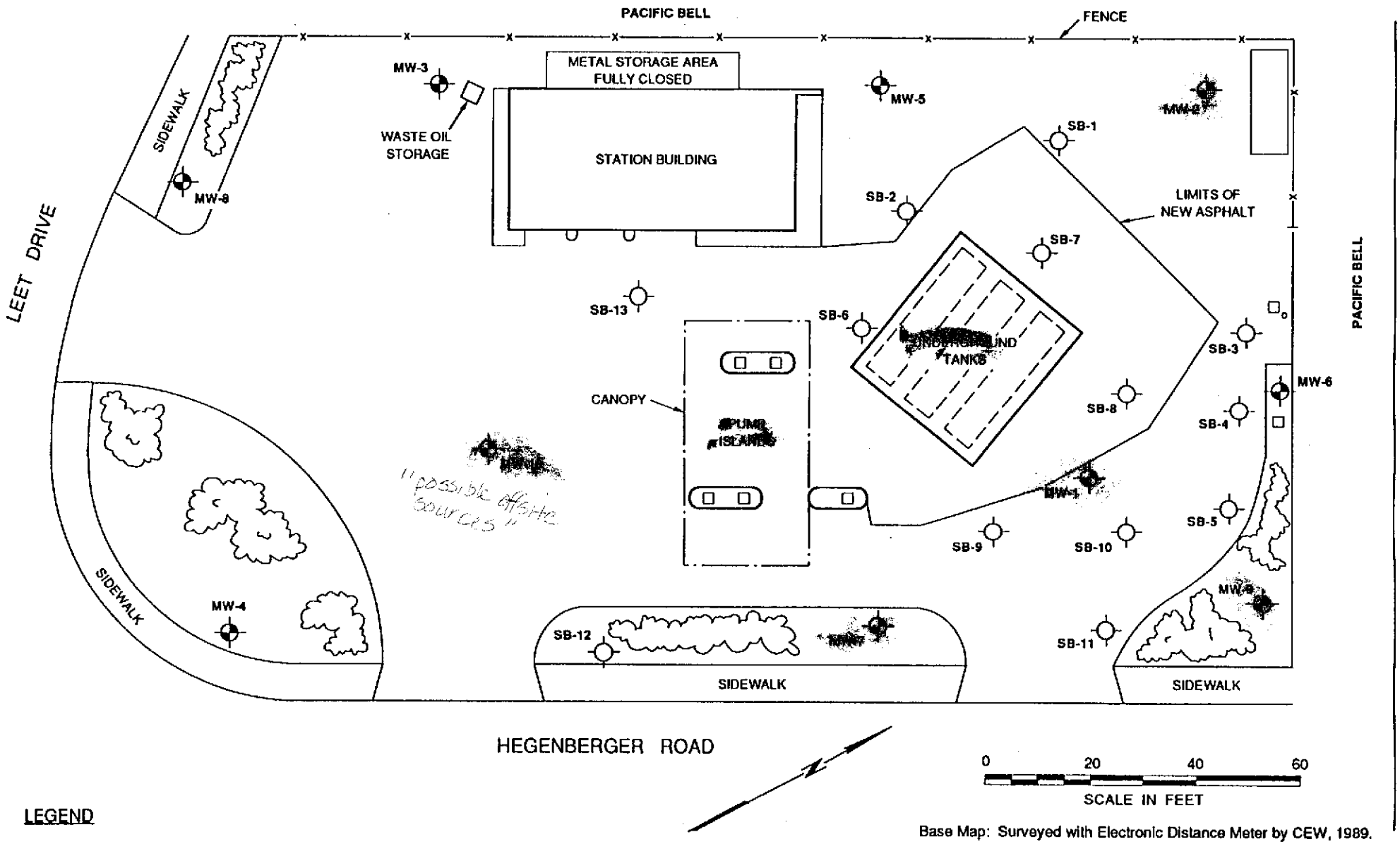
OPEN SPACE

AREA LAND USE

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental West

Scale: AS SHOWN	Project No.: 88-44-359-20
Prepared by: LQL	Date: 3/28/90
Checked by: GLS	Drawing No.: 1a
Approved by: DWC	



LEGEND

SB-1 SOIL BORING (locations approximate)

MW-1 GROUNDWATER MONITORING WELL

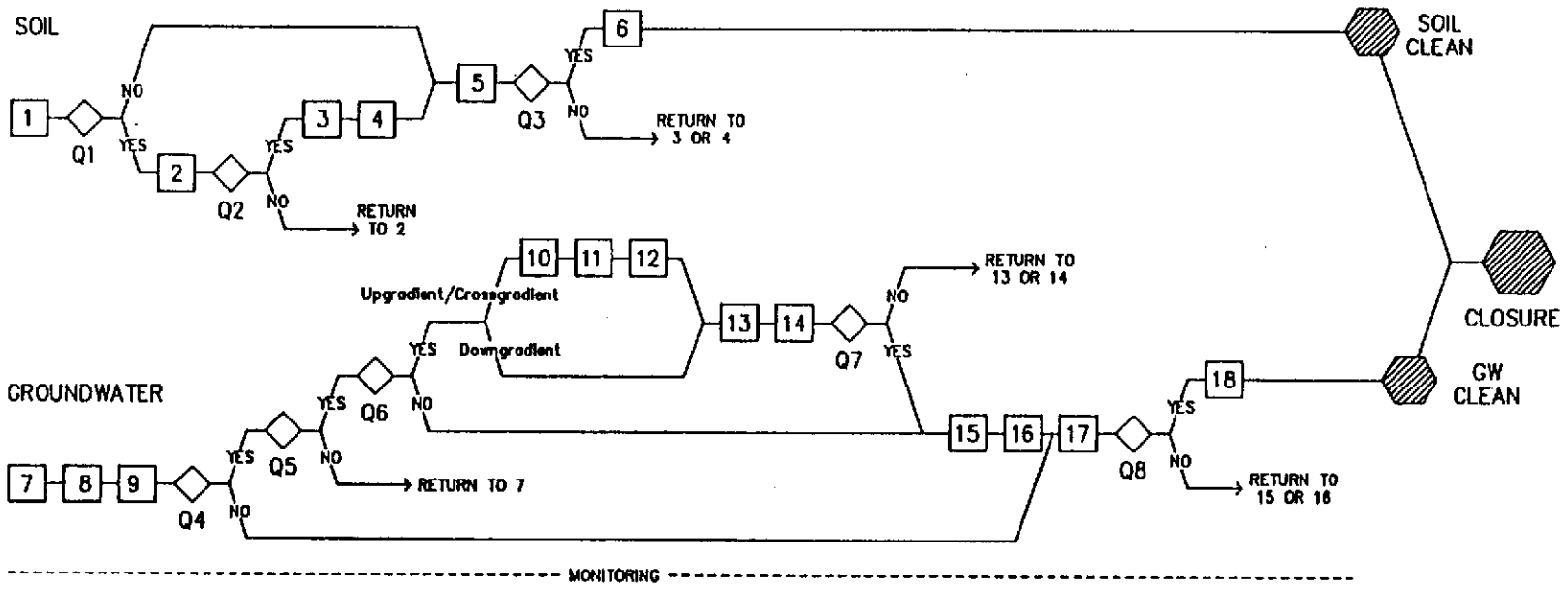
Base Map: Surveyed with Electronic Distance Meter by CEW, 1989.

PLOT PLAN

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Project No.	88-44-359-20
Prepared by	LQL
Date	3/28/90
Checked by	GLS
Drawing No.	2
Approved by	DWC



TASKS

Program 1: Onsite Soil Investigation/Remediation

Task 1 Drill and Sample Soil Borings
Task 2 Drill Step-Out Borings
Task 3 Prepare Soil Remedial Action Plan (if needed)
Task 4 Remediate Soil (if needed)
Task 5 Establish Clean Standards - Soil
Task 6 Confirm Remediated Soil

Program 2: Onsite Groundwater Investigation

Task 7 Install/Develop Groundwater Monitoring Wells
Task 8 Sample/Analyze Groundwater
Task 9 Conduct Hydrology Tests and Research

Program 3: Offsite Groundwater Investigation (if needed)

Task 10 Perform Neighborhood Assessment
Task 11 Refer to Legal Counsel
Task 12 Inform RWQCB
Task 13 Prepare Offsite Groundwater Investigation Plan
Task 14 Install Offsite Wells, Sample/Analyze

Program 4: Groundwater Remediation (if needed)

Task 15 Prepare Groundwater Remedial Action Plan
Task 16 Implement Remedial Action Plan
Task 17 Establish Cleanup Standards - Groundwater
Task 18 Confirm Groundwater Remediation

QUESTIONS

Q1: Are there concentrations of TPH greater than 100 ppm in any soil?

Q2: Is soil characterized?

Q3: Is the leaching potential acceptably low for contaminants proposed to be left in place?

Q4: Is groundwater actionable?

Q5: Is groundwater characterized onsite?

Q6: Does groundwater pollution extend offsite?

Q7: Is groundwater characterized offsite?

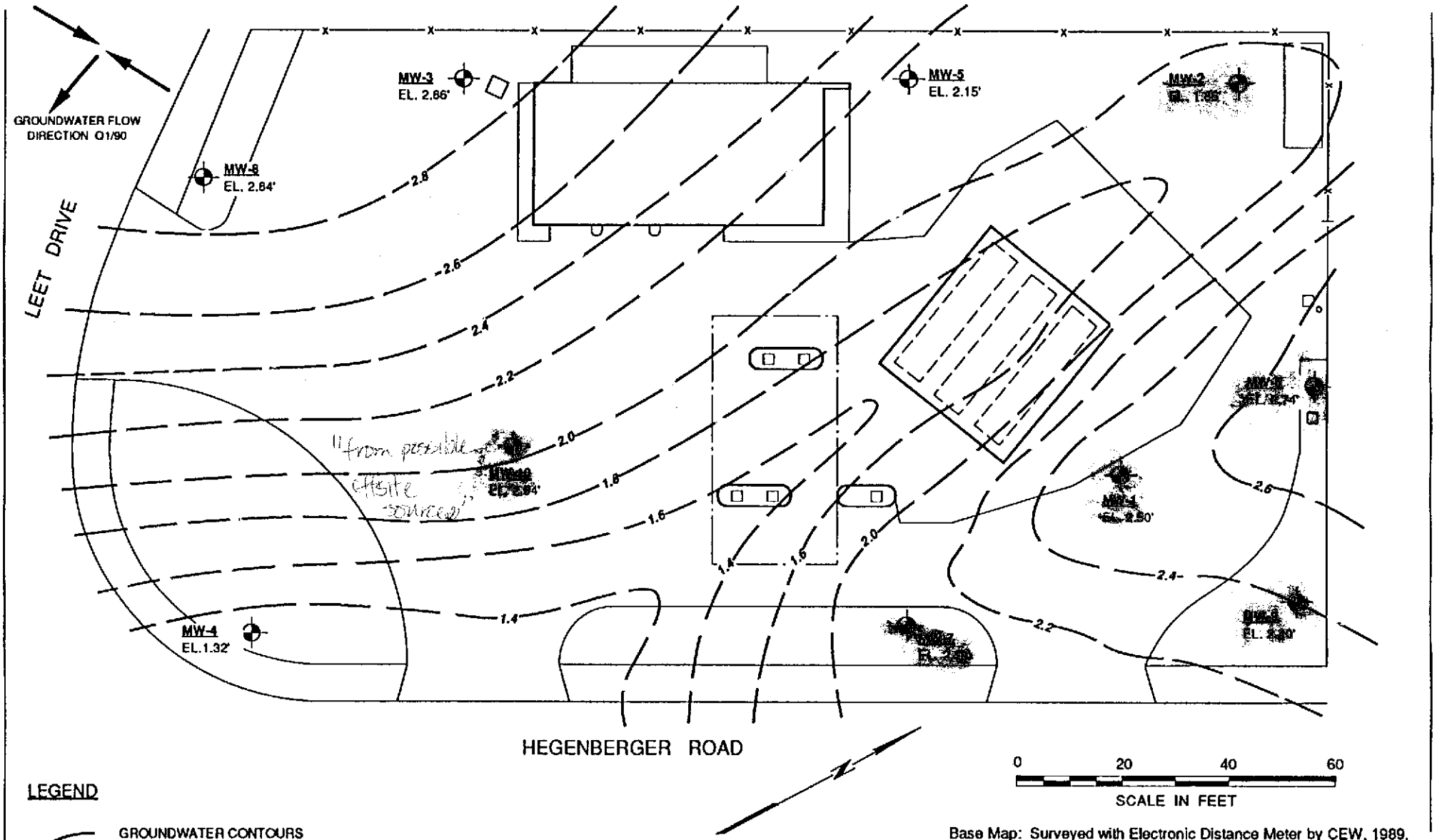
Q8: Is the environmental risk acceptably low for contaminants proposed to be left in groundwater?

SUMMARY OF PROGRESS (Q1/90)

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Project No.	88-44-359-20
Prepared by	LQL
Date	3/28/90
Checked by	GLS
Drawing No.	3
Approved by	DWC



LEGEND

GROUNDWATER CONTOURS (long dash where approximate, short dash where inferred)

MW-1 GROUNDWATER MONITORING WELL

NOTE: GROUNDWATER ELEVATIONS GIVEN IN FEET ABOVE MEAN SEA LEVEL

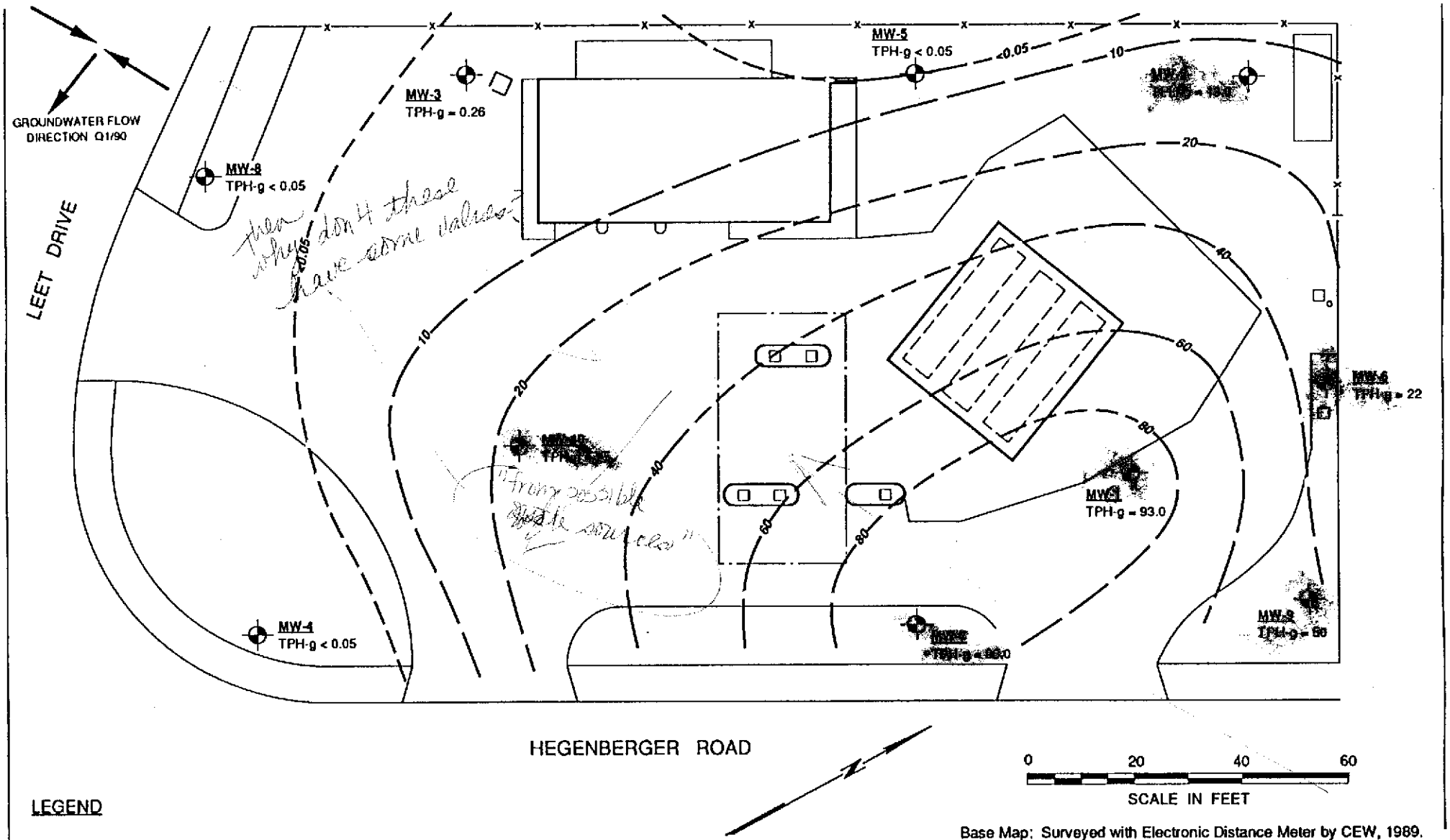
Base Map: Surveyed with Electronic Distance Meter by CEW, 1989.

POTENTIOMETRIC MAP (Q1/90)

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Project No.	88-44-359-20
Prepared by	LQL
Date	3/28/90
Checked by	GLS
Drawing No.	4
Approved by	DWC



LEGEND

- ISOCONCENTRATION CONTOUR SHOWING GASOLINE (long dash where approximate, short dash where inferred)
- MW-1 — GROUNDWATER MONITORING WELL
- TPH-g = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (in milligrams per liter)

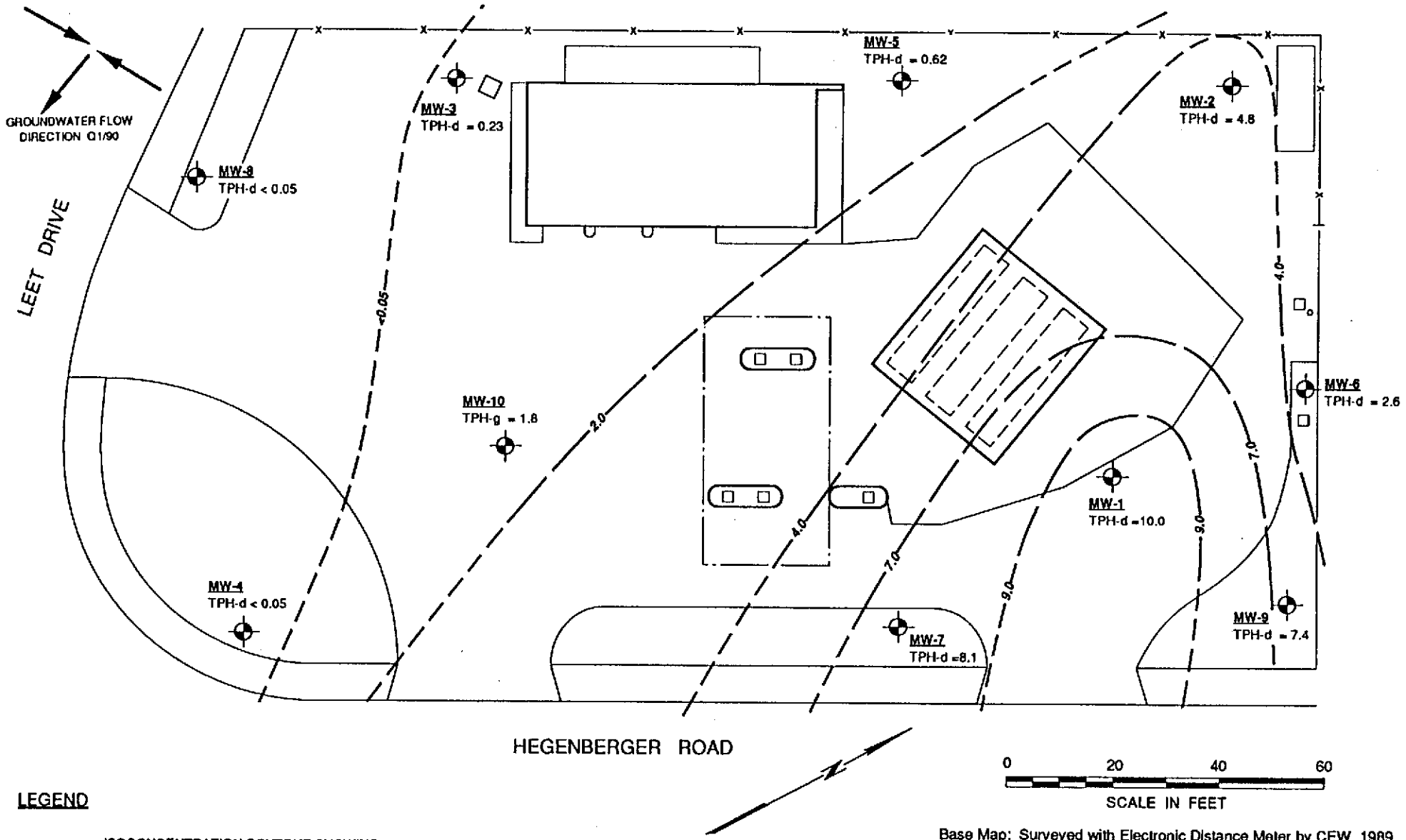
Base Map: Surveyed with Electronic Distance Meter by CEW, 1989.

PLAN: GROUNDWATER TPH-g (Q1/90)

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Project No.	88-44-359-20
Prepared by	LQL
Date	3/28/90
Checked by	GLS
Drawing No.	5
Approved by	DWC



LEGEND

- ISOCONCENTRATION CONTOUR SHOWING GASOLINE (long dash where approximate, short dash where inferred)
- MW-1 — GROUNDWATER MONITORING WELL
- TPH-d = TOTAL PETROLEUM HYDROCARBONS AS DIESEL (in milligrams per liter)

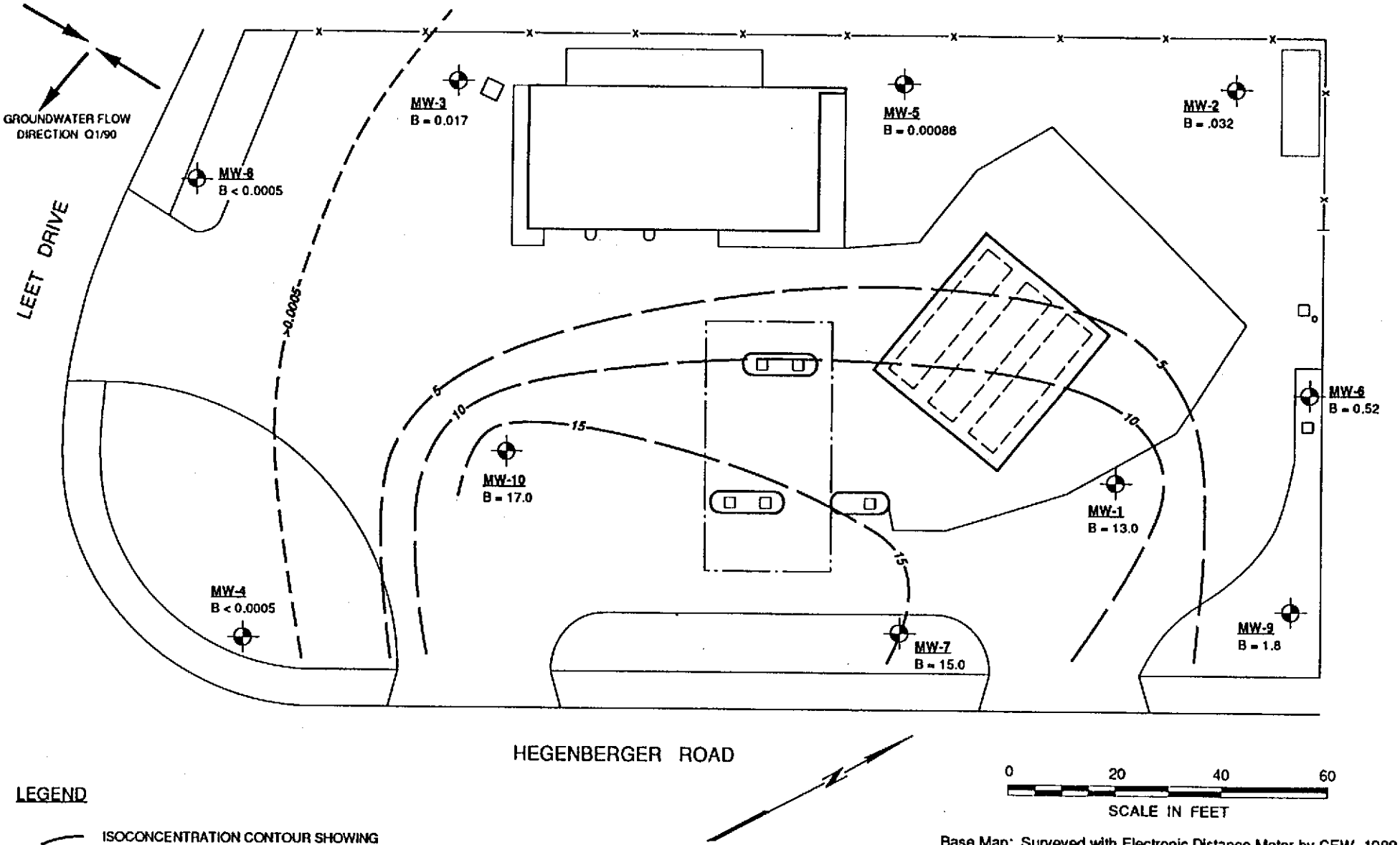
Base Map: Surveyed with Electronic Distance Meter by CEW, 1989.

PLAN: GROUNDWATER TPH-d (Q1/90)

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Project No.	88-44-359-20
Prepared by	LQL
Date	3/28/90
Checked by	GLS
Drawing No.	6
Approved by	DWC



LEGEND

ISOCONCENTRATION CONTOUR SHOWING GASOLINE (long dash where approximate, short dash where inferred)

MW-1 GROUNDWATER MONITORING WELL

B = BENZENE (in milligrams per liter)

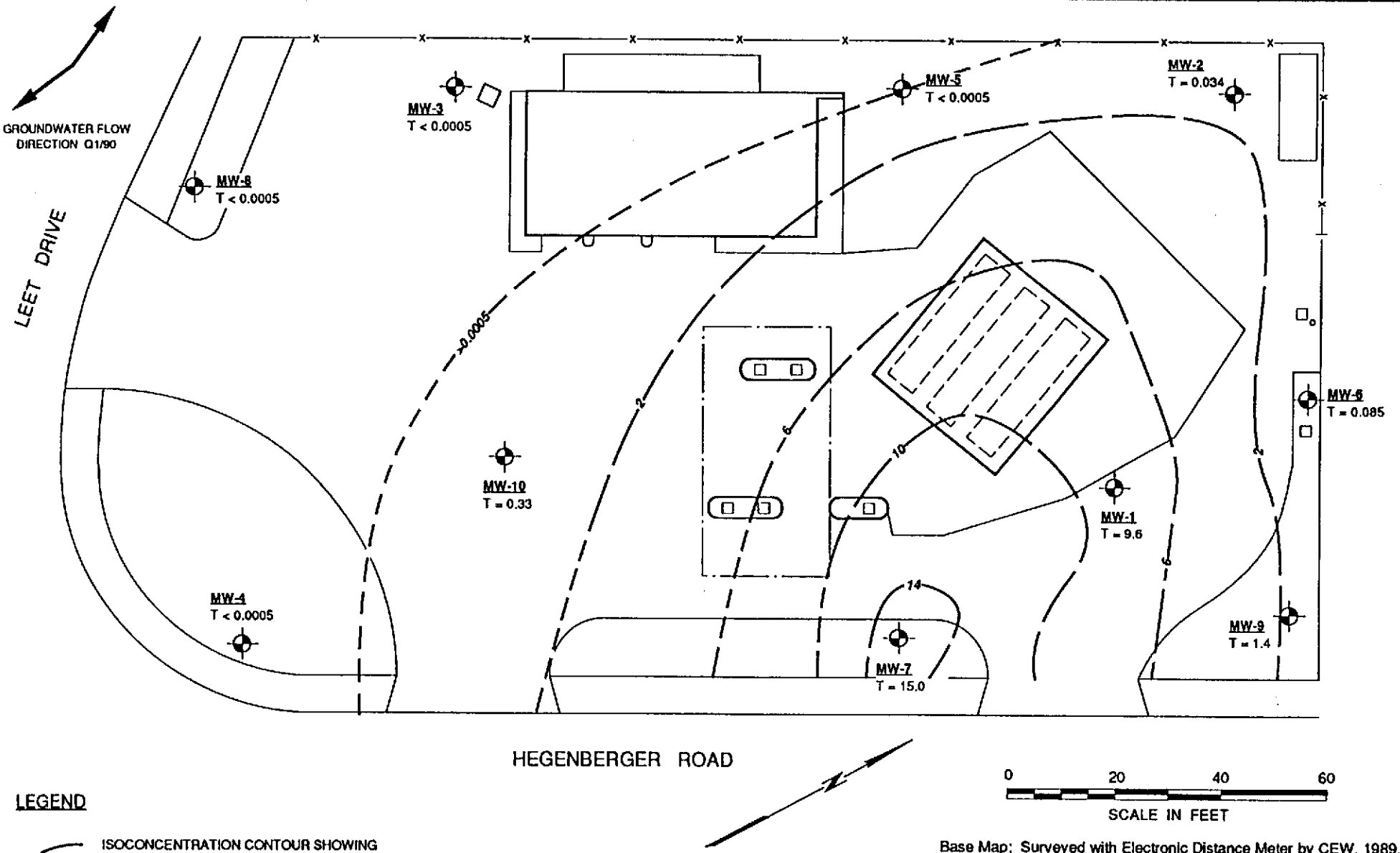
Base Map: Surveyed with Electronic Distance Meter by CEW, 1989.

PLAN: GROUNDWATER BENZENE (Q1/90)

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Project No.	88-44-359-20
Prepared by	LQL
Date	3/28/90
Checked by	GLS
Drawing No.	7
Approved by	DWC



LEGEND

ISOCONCENTRATION CONTOUR SHOWING GASOLINE (long dash where approximate, short dash where inferred)

MW-1 GROUNDWATER MONITORING WELL

T = TOLUENE (in milligrams per liter)

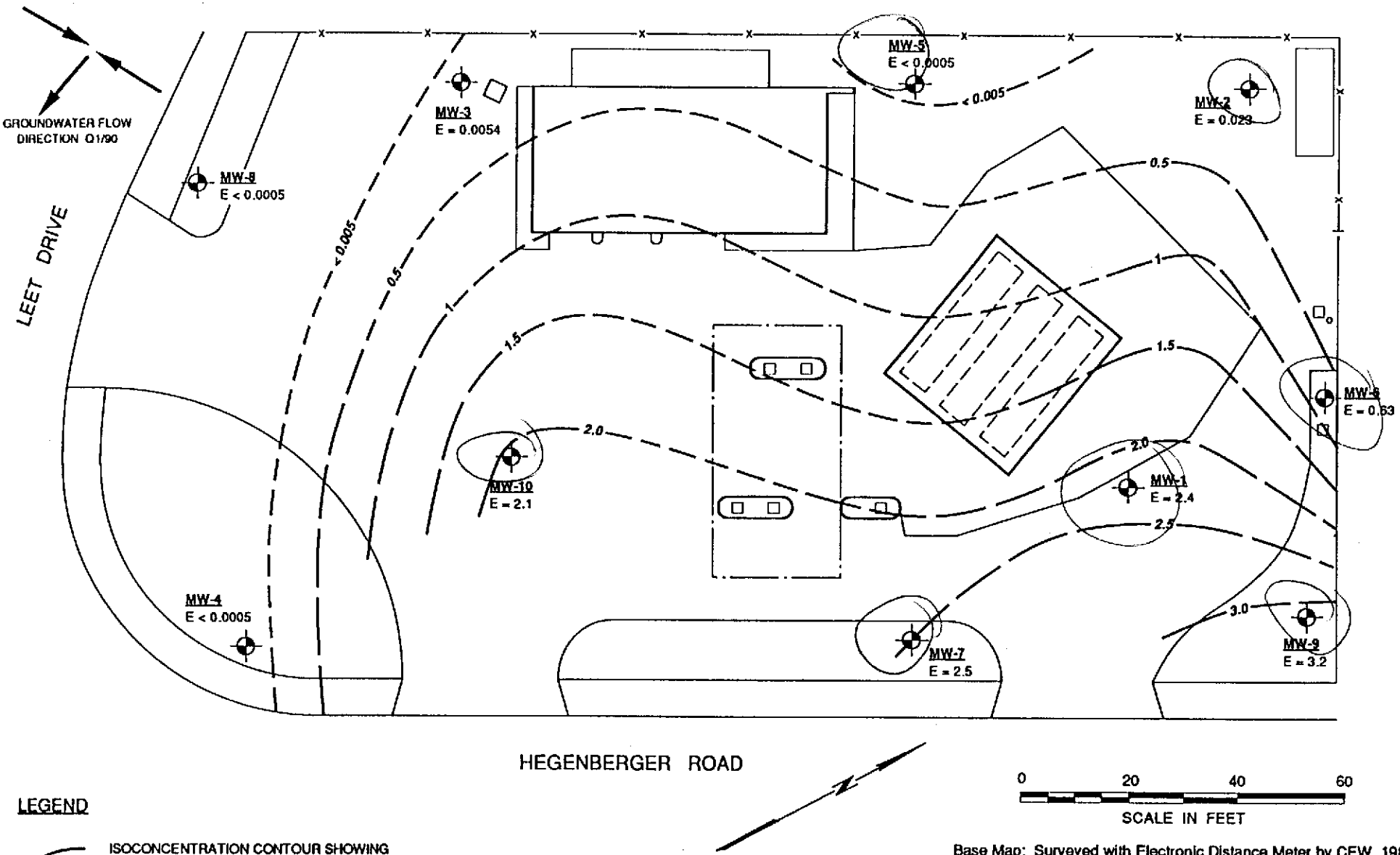
Base Map: Surveyed with Electronic Distance Meter by CEW, 1989.

PLAN: GROUNDWATER TOLUENE (Q1/90)

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Project No.	88-44-359-20
Prepared by	LQL
Date	3/28/90
Checked by	GLS
Drawing No.	8
Approved by	DWC



LEGEND

ISOCONCENTRATION CONTOUR SHOWING GASOLINE (long dash where approximate, short dash where inferred)

MW-1 GROUNDWATER MONITORING WELL

E = ETHYLBENZENE (in milligrams per liter)

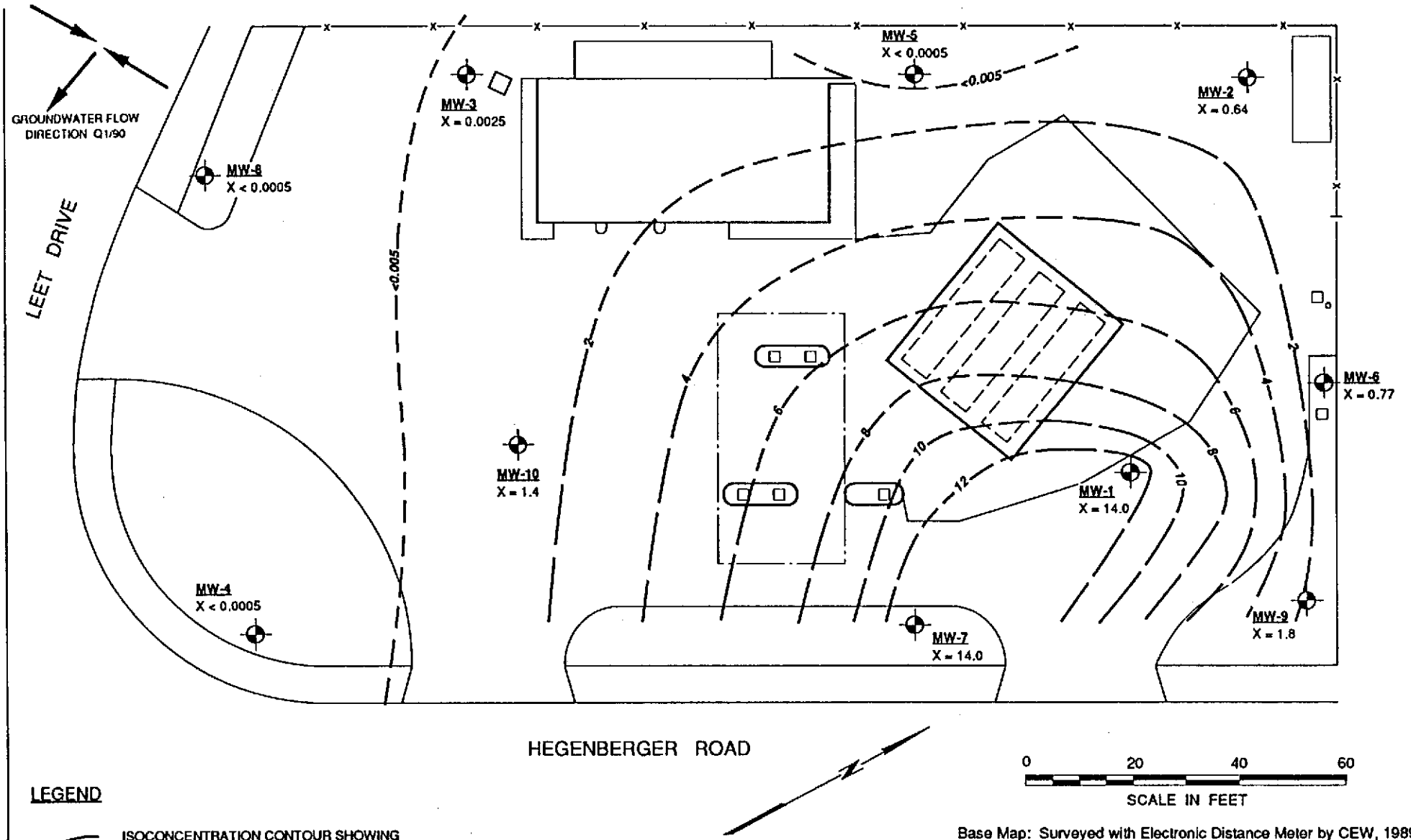
Base Map: Surveyed with Electronic Distance Meter by CEW, 1989.

PLAN: GROUNDWATER ETHYLBENZENE (Q1/90)

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental West

Scale: AS SHOWN	Project No.: 88-44-359-20
Prepared by: LQL	Date: 3/28/90
Checked by: GLS	Drawing No.: 9
Approved by: DWC	



LEGEND

ISOCONCENTRATION CONTOUR SHOWING GASOLINE (long dash where approximate, short dash where inferred)

MW-1 GROUNDWATER MONITORING WELL

X = XYLENE (in milligrams per liter)

Base Map: Surveyed with Electronic Distance Meter by CEW, 1989.

PLAN: GROUNDWATER XYLENE (Q1/90)

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Project No.	88-44-359-20
Prepared by	LQL
Date	3/28/90
Checked by	GLS
Drawing No.	10
Approved by	DWC

APPENDIX A

SITE DESCRIPTION

APPENDIX A

SITE DESCRIPTION

LOCATION

The site is located southwest of Oakland, California near the Oakland Alameda Coliseum and the Oakland International Airport. The site is specifically located on the northeast corner of Hegenberger Road and Leet Drive, south of the Airport Channel of the San Leandro Bay. Nearby businesses are chiefly light industrial and commercial operations constructed on reclaimed San Francisco Bay marsh.

SETTING

The site is located within the East Bay Plain area of Alameda County, approximately 3 miles west of the northwesterly trending Hayward Fault. The site lies on Quaternary-age Bay Mud composed of unconsolidated, dark, plastic clay and silty clay rich in organic material with some lenses of silt and sand (Hickenbottom and Muir, 1988). Bay mud materials were deposited primarily in brackish to saltwater marshes along the margins of San Francisco Bay and in coastal lagoons, on tidally exposed mudflats and beneath the shallow waters of the Bay (Helley, et al., 1979). Beneath the Bay Mud deposits lie unconsolidated younger and older alluvial deposits to a depth of approximately 1,100 feet (Hickenbottom and Muir, 1988).

The older alluvium is the major groundwater reservoir in the East Bay Plain area west of the Hayward Fault. The regional groundwater gradient is to the west-southwest toward San Francisco Bay. Recharge to groundwater reservoirs in the East Bay Plain area occur mainly by infiltration of rain, seepage from streams, and subsurface flow from adjacent areas. There is probably a small amount of recharge from excess irrigation water, lawn and garden watering, and leaking municipal sewer lines (Hickenbottom and Muir, 1988). Groundwater pumpage from wells is, at the present time, probably the main

element of groundwater discharge, although evapo-transpiration, groundwater discharge to streams, underflow to San Francisco Bay, and spring discharge are also contributing factors (Hickenbottom and Muir, 1988).

The quality of groundwater in the East Bay Plain area is generally good. Total dissolved solids concentrations are generally in the range of 300 to 1,000 milligrams per liter (mg/l). Toxic materials have, however, been introduced into the shallow aquifers in the East Bay Plain in a number of locations. These toxic materials include petroleum products, lead and chromium, organic solvents such as acetone and benzene, and many others (Hickenbottom and Muir, 1988).

Topographic maps of the area indicate that the site vicinity is nearly flat. The major surface drainage in the area is San Leandro Creek, approximately 200 feet south of the site. San Leandro Creek flows northwest into San Leandro Bay, which in turn opens into San Francisco Bay.

APPENDIX B

CHRONOLOGICAL SUMMARY

CHRONOLOGICAL SUMMARY

The following chronological summary is based on information provided to Converse Environmental West (CEW) by Shell Oil Company (Shell). CEW was not provided with certain information related to the construction, operational, and environmental history of the facility. According to Shell, the following information is not available in Shell files: volume of contaminated soil removed at the time of tank removal, geometry of the excavation created during tank removal, if any, and date and volume of any possible releases at the facility.

Date	Description of Activity
1984	Underground storage tanks replaced with single-wall fiberglass tanks.
01/89	Shell transferred this case to CEW.
02/15/89	CEW drilled and sampled MW-1 to MW-3 and SB-1 and SB-2.
04/28/89	CEW installed MW-4 through MW-8.
05/26/89	CEW drilled, sampled and abandoned borings SB-3, SB-4 and SB-5
07/13/89	CEW drilled, sampled and abandoned borings SB-6 through SB-11.
9/20-21/89	CEW conducted a tidal influence test.
10/17/89	Loma Prieta Earthquake struck.
10/26/89	CEW performed slug tests on existing wells.
11/16/89	CEW drilled, sampled and abandoned SB-12 and SB-13.
11/16/89	CEW installed MW-10.
12/15/89	CEW developed MM-10 and collected Q4/89 groundwater samples.
1/17/90 and 2/02/90	**CEW performed offsite survey and survey calculations of property adjacent to site.**
2/7/90	**CEW sampled wells MW-1, MW-2, MW-5, MW-6, MW-7, MW-9.**
2/8/90	**CEW sampled wells MW-5, MW-7, MW-9.**
3/8/90	**CEW sampled wells MW-3, MW-4, MW-8, MW-10**

Boldface items were conducted during Q1/90

APPENDIX C

LABORATORY REPORTS AND CHAIN-OF-CUSTODY FORMS

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Robin Breuer
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

Date: 02-22-90
NET Client Acct No: 18.02
NET Pacific Log No: 9684
Received: 02-09-90 2300

Client Reference Information

SHELL, 285 Hegenberger Rd., Oakland; Project: 88-44-359-01

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

Jules Skamarack
Laboratory Manager

Enclosure(s)

Ref: SHELL, 285 Hegenberger Rd., Oakland; Project: 88-44-359-01

Parameter	Reporting Limit	Descriptor, Lab No. and Results MW-6 02-07-90 1118 46096	 MW-1 02-07-90 1525 46097	 MW-2 02-07-90 1545 46098	Units
PETROLEUM HYDROCARBONS		--	--	--	
VOLATILE (WATER)		--	--	--	
DILUTION FACTOR *		20	50	10	
DATE ANALYZED		02-19-90	02-19-90	02-19-90	
METHOD GC FID/5030		--	--	--	
as Gasoline	0.05	22	93	13	mg/L
METHOD 602		--	--	--	
Benzene	0.5	520	13,000	32	ug/L
Ethylbenzene	0.5	630	2,400	230	ug/L
Toluene	0.5	85	9,600	34	ug/L
Xylenes, total	0.5	770	14,000	640	ug/L
PETROLEUM HYDROCARBONS		--	--	--	
EXTRACTABLE (WATER)		--	--	--	
DILUTION FACTOR *		1	1	1	
DATE EXTRACTED		02-13-90	02-13-90	02-13-90	
DATE ANALYZED		02-15-90	02-15-90	02-15-90	
METHOD GC FID/3510		--	--	--	
as Diesel	0.05	2.6	10	4.8	mg/L
as Motor Oil	0.05	ND	ND	ND	mg/L

Ref: SHELL, 285 Hegenberger Rd., Oakland; Project: 88-44-359-01

QUALITY CONTROL RESULTS - TOTAL PETROLEUM HYDROCARBONS (water)

Parameter	Reporting Limits	Units	Blank Results	Lab No. Spike and Spike Replicate Results (% Recovery) (-45593S)	(-45593SR)	RPD
as Gasoline	0.05	mg/L	ND	102	100	2
Benzene	0.5	ug/L	ND	102	102	<1
Toluene	0.5	ug/L	ND	101	101	<1

QUALITY CONTROL RESULTS - TOTAL PETROLEUM HYDROCARBONS (water)

Parameter	Reporting Limits	Units	Blank Results	Lab No. Spike and Spike Replicate Results (% Recovery) (-45827S)	(-45827SR)	RPD
as Diesel	0.5	mg/L	ND	87	67	27

KEY TO ABBREVIATIONS and METHOD REFERENCES

<	:	Less than; When appearing in results column indicates analyte not detected at the value following, which supercedes the listed reporting limit.
mean	:	Average; sum of measurements divided by number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
N/A	:	Not applicable.
NA	:	Not analyzed.
ND	:	Not detected; the analyte concentration is less than applicable listed reporting limit.
NTU	:	Nephelometric turbidity units.
RPD	:	Relative percent difference, 100 [Value 1 - Value 2]/mean value.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
umhos/cm	:	Micromhos per centimeter.

Method References

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

* Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated reporting limits by the dilution factor.

CONVERSE ENVIRONMENTAL

9684

CHAIN OF CUSTODY RECORD

P.M. Robin Breuer
WIC 204-5508-5504
AFE 981696
Exp Code 5441
Shell Engineer Diana Lugquist

PROJECT NO.: 88-44-359-01

SAMPLERS: (Signature) Thomas Smith

PROJECT NAME / CROSS STREET: Shell Oil Company 285 Hegenberger Rd Oakland, CA

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	TPH-GAS	BTEX	TPH-Diesel				REMARKS
MW-6	2/7/90	11:18		✓	(Oakland) 40 ml VOA	4	✓	✓					All Samples Standard turnaround time
MW-6	2/7/90	11:18		✓	" Amber Liters "	3			✓				Incl. one liter for QC
MW-1	2/7/90	15:25		✓	40ml VOA	4	✓	✓					
MW-1	2/7/90	15:25		✓	Amber Liters	2			✓				
MW-2	2/7/90	15:45		✓	40ml VOA	4	✓	✓					
MW-2	2/7/90	15:45		✓	Amber Liters	2			✓				

RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signartue)	RELINQUISHED BY: (Signature)	DATE / TIME	RECEIVED BY: (Signature)
Thomas Smith	DATE: 2/9 TIME: 15:40	Jeff Windler	Jeff Windler	DATE: TIME:	
RELINQUISHED BY: (Signature)	DATE: TIME:	RECEIVED BY: (Signartue)	RELINQUISHED BY: (Signature)	DATE: TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY COURIER: (Sign.)	DATE: TIME:	RECEIVED BY MOBILE LAB: (Sign.)	RELINQ. BY MOBILE LAB: (Signatue)	DATE: TIME:	RECEIVED BY COURIER: (Signature)
METHOD OF SHIPMENT (VIA NCS)		SHIPPED BY: (Signatue)	RECEIVED FOR LAB: (Signature) K Temple	DATE: 2-9-90 TIME: 2300	COURIER FROM AIRPORT: (Signature)

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Doug Charlton
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

Date: 02-22-90
NET Client Acct No: 18.02
NET Pacific Log No: 9683
Received: 02-09-90 2300

Client Reference Information

SHELL, 285 Hegenberger Rd.,Oakland: Project: 88-44-359-01

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

Jules Skamarack
Laboratory Manager

Enclosure(s)

Ref: SHELL, 285 Hegenberger Rd.,Oakland: Project: 88-44-359-01

		Descriptor, Lab No. and Results			
Parameter	Reporting Limit	MW-9 02-08-90 0900 46093	MW-7 02-08-90 0931 46094	MW-5 02-08-90 1000 46095	Units
PETROLEUM HYDROCARBONS		--	--	--	
VOLATILE (WATER)		--	--	--	
DILUTION FACTOR *		20	50	1	
DATE ANALYZED		02-16-90	02-19-90	02-19-90	
METHOD GC FID/5030		--	--	--	
as Gasoline	0.05	50	96	ND	mg/L
METHOD 602		--	--	--	
Benzene	0.5	1,800	15,000	0.88	ug/L
Ethylbenzene	0.5	3,200	2,500	ND	ug/L
Toluene	0.5	1,400	15,000	ND	ug/L
Xylenes, total	0.5	1,800	14,000	ND	ug/L
PETROLEUM HYDROCARBONS		--	--	--	
EXTRACTABLE (WATER)		--	--	--	
DILUTION FACTOR *		1	1	1	
DATE EXTRACTED		02-13-90	02-13-90	02-13-90	
DATE ANALYZED		02-15-90	02-15-90	02-15-90	
METHOD GC FID/3510		--	--	--	
as Diesel	0.05	7.4	8.1	0.62	mg/L
as Motor Oil	0.05	ND	ND	ND	mg/L

Ref: SHELL, 285 Hegenberger Rd.,Oakland: Project: 88-44-359-01

QUALITY CONTROL RESULTS - TOTAL PETROLEUM HYDROCARBONS (water)

Parameter	Reporting Limits	Units	Blank Results	Lab No. Spike and Spike Replicate Results (% Recovery) (-45593S)	(-45593SR)	RPD
as Gasoline	0.05	mg/L	ND	102	100	2
Benzene	0.5	ug/L	ND	102	102	<1
Toluene	0.5	ug/L	ND	101	101	<1

QUALITY CONTROL RESULTS - TOTAL PETROLEUM HYDROCARBONS (water)

Parameter	Reporting Limits	Units	Blank Results	Lab No. Spike and Spike Replicate Results (% Recovery) (-45827S)	(-45827SR)	RPD
as Diesel	0.5	mg/L	ND	87	67	27

KEY TO ABBREVIATIONS and METHOD REFERENCES

<	:	Less than; When appearing in results column indicates analyte not detected at the value following, which supercedes the listed reporting limit.
mean	:	Average; sum of measurements divided by number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
N/A	:	Not applicable.
NA	:	Not analyzed.
ND	:	Not detected; the analyte concentration is less than applicable listed reporting limit.
NTU	:	Nephelometric turbidity units.
RPD	:	Relative percent difference, 100 [Value 1 - Value 2]/mean value.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
umhos/cm	:	Micromhos per centimeter.

Method References

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

* Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated reporting limits by the dilution factor.

CONVERSE ENVIRONMENTAL WEST

CHAIN OF CUSTODY RECORD

9683

P.M. DMC
AFE. 956696
EXP: 5441
WIC: 204-5508-5504
SHELL P.M. - DMC.

PROJECT NO.:	PROJECT NAME / CROSS STREET :
38-44-359-01	SHELL OIL 285 HEGENBERGER RD OAKLAND CA.
SAMPLERS: (Signature)	

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	ANALYSES: TPH - Gas	ANALYSES: TPH - Diesel	ANALYSES: BTEX				REMARKS
MW8	2/8/90	09:00			40ML VOAS	4	X		X				
MW9	2/8/90	09:00			AMBER LITERS	3		X					
MW7	2/8/90	09:31			40ML VOAS	4	X		X				
MW7	2/8/90	09:31			AMBER LITERS	1		X					
MW5	2/8/90	10:00			40ML VOAS	4	X		X				
MW5	2/8/90	10:00			AMBER LITERS	1		X					

RELINQUISHED BY: (Signature)	DATE: 2/8/90 TIME: 17:40	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE: 2/9 TIME: 15:10	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE: TIME:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE: TIME:	RECEIVED BY: (Signature)
RELINQUISHED BY COURIER: (Sign.)	DATE: TIME:	RECEIVED BY MOBILE LAB: (Sign.)	RELINQ. BY MOBILE LAB: (Signature)	DATE: TIME:	RECEIVED BY COURIER: (Signature)
METHOD OF SHIPMENT: (VIA NCS)		SHIPPED BY: (Signature)	RECEIVED FOR LAB: (Signature)	DATE: 2-9-90 TIME: 2300	COURIER FROM AIRPORT: (Signature)

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Robin Breuer
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

Date: 03-22-90
NET Client Acct No: 18.02
NET Pacific Log No: 1083
Received: 03-09-90 2300

Client Reference Information

SHELL, 285 Hegenberger, Oakland; Project: 88-44-359-20

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

Jules Skamarack
Laboratory Manager

Enclosure(s)

Ref: SHELL, 285 Hegenberger, Oakland; Project: 88-44-359-20

		Descriptor, Lab No. and Results			
		MW3	MW 8	MW 4	
		03-08-90	03-08-90	03-08-90	
Parameter	Reporting Limit	48342	48343	48344	Units
PETROLEUM HYDROCARBONS		--	--	--	
VOLATILE (WATER)		--	--	--	
DILUTION FACTOR *		1	1	1	
DATE ANALYZED		03-16-90	03-15-90	03-15-90	
METHOD GC FID/5030		--	--	--	
as Gasoline	0.05	0.26	ND	ND	mg/L
METHOD 602		--	--	--	
Benzene	0.5	17	ND	ND	ug/L
Ethylbenzene	0.5	5.4	ND	ND	ug/L
Toluene	0.5	ND	ND	ND	ug/L
Xylenes, total	0.5	2.5	ND	ND	ug/L
PETROLEUM HYDROCARBONS		--	--	--	
EXTRACTABLE (WATER)		--	--	--	
DILUTION FACTOR *		1	1	1	
DATE EXTRACTED		03-13-90	03-13-90	03-13-90	
DATE ANALYZED		03-15-90	03-15-90	03-15-90	
METHOD GC FID/3510		--	--	--	
as Diesel	0.05	0.23	ND	ND	mg/L
as Motor Oil	0.05	ND	ND	ND	mg/L

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 1083

Date: 03-22-90
Page: 3

Ref: SHELL, 285 Hegenberger, Oakland; Project: 88-44-359-20

		Descriptor, Lab No. and Results		
		MW 10 03-08-90	trip blank 03-08-90	
Parameter	Reporting Limit	48345	48346	Units
PETROLEUM HYDROCARBONS		--	--	
VOLATILE (WATER)		--	--	
DILUTION FACTOR *		100	1	
DATE ANALYZED		03-16-90	03-16-90	
METHOD GC FID/5030		--	--	
as Gasoline	0.05	25	ND	mg/L
METHOD 602		--	--	
Benzene	0.5	17,000	ND	ug/L
Ethylbenzene	0.5	2,100	ND	ug/L
Toluene	0.5	330	ND	ug/L
Xylenes, total	0.5	1,400	ND	ug/L
PETROLEUM HYDROCARBONS		--	--	
EXTRACTABLE (WATER)		--	--	
DILUTION FACTOR *		1	1	
DATE EXTRACTED		03-13-90	03-13-90	
DATE ANALYZED		03-15-90	03-15-90	
METHOD GC FID/3510		--	--	
as Diesel	0.05	1.8	ND	mg/L
as Motor Oil	0.05	ND	ND	mg/L

Ref: SHELL, 285 Hegenberger, Oakland; Project: 88-44-359-20

QUALITY CONTROL RESULTS - TOTAL PETROLEUM HYDROCARBONS (water)

Parameter	Reporting Limits	Units	Blank Results	Lab No. Spike and Spike Replicate Results (% Recovery) (-48280S)	(-48280SR)	RPD
as Diesel	0.05	mg/L	ND	86	75	14

QUALITY CONTROL RESULTS - TOTAL PETROLEUM HYDROCARBONS (water)

Parameter	Reporting Limits	Units	Blank Results	Lab No. Spike and Spike Replicate Results (% Recovery) (-48389S)	(-48389SR)	RPD
as Gasoline	0.05	mg/L	ND	92	92	<1
Benzene	0.5	ug/L	ND	114	114	<1
Toluene	0.5	ug/L	ND	110	110	<1

KEY TO ABBREVIATIONS and METHOD REFERENCES

<	:	Less than; When appearing in results column indicates analyte not detected at the value following, which supercedes the listed reporting limit.
mean	:	Average; sum of measurements divided by number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
N/A	:	Not applicable.
NA	:	Not analyzed.
ND	:	Not detected; the analyte concentration is less than applicable listed reporting limit.
NTU	:	Nephelometric turbidity units.
RPD	:	Relative percent difference, 100 [Value 1 - Value 2]/mean value.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
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umhos/cm	:	Micromhos per centimeter.

Method References

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Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

* Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated reporting limits by the dilution factor.

PM: 10.D
WIC: 204-5508-5301
AFE: 98671
EXP: 5441

CONVERSE ENVIRONMENTAL 1083

CHAIN OF CUSTODY RECORD

PROJECT NO.: 88-44-359-20
PROJECT NAME / CROSS STREET: Shell Oil 285 Hegenberger Oakland CA
SAMPLERS: (Signature)

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	ANALYSES: THP-G	THP-D	BETX				REMARKS
MW3	3/7/90				40 ML VOA	4	X		X				1 WEEK TURN AROUND
"					AMBER LITER	1		X					
MW8	3/6/90				40 ML VOA	4	X		X				
"					AMBER LITER	1		X					
MW11	3/5/90				40 ML VOA	4	X		X				
"					AMBER LITER	1		X					
MW10	3/3/90				40 ML VOA	4	X		X				
"					AMBER LITER	2		X					
TRIP BLANK					40 ML VOA	1	X		X				per Chuck to NP 3/12
"					AMBER LITER	1		X					

CUSTODY SEAL INTACT 3/9/90 JS
custody seal applied 19:00 @ 3/9/90

RELINQUISHED BY: (Signature)	DATE: 3/8/90	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE: / TIME: / RECEIVED BY: (Signature)
	TIME: 13:25			
RELINQUISHED BY: (Signature)	DATE:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE: / TIME: / RECEIVED BY: (Signature)
	TIME:			
RELINQUISHED BY COURIER: (Sign.)	DATE:	RECEIVED BY MOBILE LAB: (Sign.)	RELINQ. BY MOBILE LAB: (Signature)	DATE: / TIME: / RECEIVED BY COURIER: (Signature)
	TIME:			
METHOD OF SHIPMENT		SHIPPED BY: (Signature) via NCS	RECEIVED FOR LAB: (Signature)	DATE: 3/9/90 TIME: 2300 / COURIER FROM AIRPORT: (Signature)