CONVERSE ENVIRONMENTAL WEST

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91 JAN -7 PM 12: 25

December 28, 1990
88-44-359-20-1014

Ms. Penny Silzer
San Francisco Bay Regional Water Quality Control Board
1800 Harrison Street, Room 700
Oakland, California 94612

Subject: Shell Oil Company - Quarter 4, 1990 Report
285 Hegenberger Road
Oakland, California

Dear Ms. Silzer:

Enclosed please find one copy of the Shell Oil Company Quarterly Report of Activities Quarter 4, 1990 prepared by Converse Environmental West (CEW) -San Francisco.

Please call if you have any questions.

Very truly yours,

Converse Environmental West

Charles R. Comstock
Technical Director

CRC:gts

Enclosure

cc: Mr. Rafat Shahid - Alameda County Health Care Services (w/ encl.)

285 HEGENBERGER III\SILZER1.014

REPORT OF ACTIVITIES
QUARTER 4, 1990

SHELL OIL COMPANY FACILITY
285 HEGENBERGER ROAD
OAKLAND, CALIFORNIA

Prepared for:

Shell Oil Company
511 North Brookhurst Street
Anaheim, California 92803

Prepared by:

Converse Environmental West
55 Hawthorne, Suite 500
San Francisco, California 94105

December 28, 1990

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 4, 1990 (Q4/90) for the 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 2). The site is approximately 235 feet long by 130 feet wide. 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 chronological summary of environmental activities conducted at the site is presented in Appendix A.

1.2 SCOPE OF ACTIVITIES

The investigative activities conducted during Q4/90 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 Q4/90 consisted of the following:

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

- 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 these deviations may have on the database 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. Closure documentation will provide a final, best hypothesis that is fully explained.

SECTION 2

WORK COMPLETED THIS QUARTER

Work initiated and completed during Q4/90 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 and the CEW protocols are on file with the regulatory agencies of jurisdiction. No modifications were made to the revised Work Plan.

2.1 Soil Sampling and Analyses

No new soil samples were taken during Q4/90. Soil boring information is presented in Table 2.

2.2 Groundwater Sampling and Analysis

Groundwater samples were collected on September 28 and October 1, 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), following the recommended analytical methods listed in Table 5. Analytical data for the water samples collected from the monitoring wells are summarized in Table 6. Laboratory reports and chain-of-custody forms are provided in Appendix B.

2.3 Physical Monitoring Activities

During Q4/90, 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.

SECTION 3

FINDINGS AND DISCUSSION

3.1 Soil

Stratigraphy and geologic setting are presented in previous progress reports on file with local agencies of jurisdiction. A summary of soil analytical results are presented in Table 3.

3.2 Groundwater

3.2.1 Elevation and Gradient

Groundwater measurements ranged from 4.60 feet below grade surface (bgs) in well MW-4 to 0.03 feet bgs in MW-1 (Table 7). Groundwater flow direction and gradient varied across the site. Flow direction during Q4/90 was generally in a southerly direction. The variation in flow directions during this and previous quarterly monitoring periods is most likely due to tidal influence and due to differentiation in soil types and their respective response to water level changes.

3.2.2 Results of Chemical Analyses

The following is a list of the principal findings and conclusions from groundwater chemical monitoring at the site. Chemical data is summarized in Table 6.

- TPH-g was detected in all monitoring wells except wells MW-4 and MW-8.

- TPH-d was detected in all monitoring wells except wells MW-6 and MW-7. MW-4 was not analyzed for TPH-d.

- BTEX were detected in all monitoring wells except wells MW-4 and MW-8. Ethylbenzene was not detected in well MW-3.

3.3 Discussion

Semi annual sampling for MW-4 and MW-8 will continue during Q1/91.

SECTION 4

NEXT QUARTER ACTIVITIES

4.1 WORK PLAN MODIFICATIONS

No modifications were made to the workplan.

4.2 PROPOSED ACTIVITIES

The following activities will be conducted in Q1/91:

(1) Continue quarterly monitoring and groundwater sampling.

(2) Expand remedial investigation offsite.

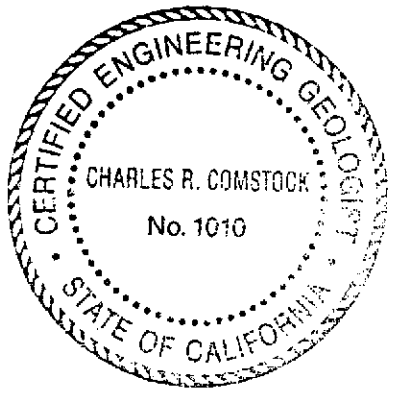
(3) Continue detailed cost and technical analyses and support for Shell to proceed with source area soils remedial activities.

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,



CHARLES R. COMSTOCK
Principal Geologist

PRIMARY CONTACTS

Shell Oil Company Facility
285 Hegenberger Road
Oakland, California

Quarter 4, 1990

Regional Water Quality Control Board Representative:	Ms. Penny Silzer San Francisco Bay Regional Water Quality Control Board 1800 Harrison Street, Room 700 Oakland, California 94612
LIA Representative:	Mr. Rafat Shahid Alameda County Health Care Services Agency 80 Swan Way, Room 200 Oakland, California 94621
Shell Engineer:	Mr. Paul Hayes Shell Oil Company 511 North Brookhurst Street Anaheim, California 92803
Converse Project Manager:	Mr. Charles R. Comstock Converse Environmental West 55 Hawthorne, Suite 500 San Francisco, California 94105
Registered Geologist in Charge:	Mr. Charles R. Comstock Converse Environmental West 55 Hawthorne Street, Suite 500 San Francisco, California 94105
Site Owner:	Shell Oil Company

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Hickenbottom, K., and Muir, K., 1988, Geohydrology and groundwater quality overview, of the East Bay Plain area, Alameda County, California, 205(j) Report, Alameda County Flood Control and Water Conservation District, 83p., appendix.

TABLE 1. ACTIVITY SUMMARY - QUARTER 4, 1990

Shell Oil Company Facility
285 Hegenberger Road
Oakland, California

PERCENT COMPLETE

Activity	Quarter 4, 1990 Onsite	Quarter 4, 1990 Offsite	Total to Date Onsite	Total to Date Offsite
Soil Characterization	0	0	60%	15%
Groundwater Characterization (Dissolved Product)	0	0	75%	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

NOTE:

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 2 (cont'd). 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)
SG-1	8/6/90	6.0	8/7/90	3,6	None	45
SG-2	8/6/90	5.5	8/7/90	3,5.5	None	1218
SG-3	8/6/90	6.0	8/7/90	3,6	None	80
SG-4	8/6/90	6.0	8/7/90	3,6	None	6.0
SG-5	8/6/90	6.0	8/7/90	3,6	None	1025
SG-6	8/6/90	6.0	8/7/90	3,6	None	2.0
SG-7	8/7/90	6.0	8/7/90	3,6	None	716
SG-8	8/7/90	5.5	8/7/90	3,5.5	None	608
SG-9	8/7/90	6.0	8/7/90	3,6	None	28
SG-10	8/7/90	6.0	8/7/90	3,6	None	669
SG-11	8/7/90	6.0	8/7/90	3,6	None	525
SG-12	8/7/90	6.0	8/7/90	3,6	None	823
SG-13	8/7/90	6.0	8/7/90	3,6	None	NM
SG-14	9/13/90	6.0	8/13/90	3.6	None	0
SG-15	9/13/90	6.0	8/13/90	3.6	None	0
SG-16	9/13/90	6.0	8/13/90	3.6	None	0
SG-17	9/13/90	6.0	8/13/90	3.6	6	0

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 (mg/kg) 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
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

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 (mg/kg) TPH-g	TPH-d	Benzene	Toluene	Ethyl-benzene	Xylenes	Lead[1]
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
SG-1	3.0	8/06/90	<0.1	NA	<0.005	<0.005	<0.005	0.043	NA
SG-1	6.0		4.0	NA	0.140	0.018	0.076	0.037	NA
SG-2	3.0	8/06/90	<0.1	NA	<0.005	<0.005	<0.005	<0.005	NA
SG-2	5.5		4000	NA	22.0	110	100	510	NA
SG-3	3.0	8/06/90	<0.1	NA	<0.005	0.010	0.008	0.042	NA
SG-3	6.0		110	NA	0.640	<0.005	3.50	16.0	NA
SG-4	3.0	8/06/90	<0.1	NA	<0.005	<0.005	<0.005	<0.005	NA
SG-4	6.0		1.70	NA	<0.005	<0.005	<0.005	0.026	NA
SG-5	3.0	8/06/90	<0.1	NA	<0.005	<0.005	<0.005	<0.005	NA
SG-5	6.0		610	NA	<0.005	<0.005	<0.005	<0.005	NA
SG-6	3.0	8/06/90	<0.1	NA	<0.005	0.009	<0.005	<0.005	NA
SG-6	6.0		2.90	NA	<0.005	0.006	0.023	0.064	NA
SG-7	6.0	8/07/90	<0.1	NA	<0.005	<0.005	<0.005	<0.005	NA
SG-7	6.0		1900	NA	<0.005	<0.005	<0.005	35.0	NA
SG-8	3.0	8/07/90	16.0	NA	0.220	0.073	0.320	0.084	NA
SG-8	5.5		51.0	NA	1.90	<0.005	3.20	9.30	NA
SG-9	3.0	8/07/90	<0.1	NA	<0.005	<0.005	<0.005	<0.005	NA
SG-9	6.0		<0.1	NA	<0.005	<0.005	<0.005	<0.005	NA
SG-10	3.0	8/07/90	<0.1	NA	<0.005	<0.005	<0.005	<0.005	NA
SG-10	6.0		3000	NA	11.0	44.0	73.0	400	NA
SG-11	3.0	8/07/90	<0.1	NA	<0.005	<0.005	<0.005	<0.005	NA
SG-11	6.0		240	NA	<0.005	<0.005	1.40	2.60	NA
SG-12	3.0	8/07/90	<0.1	NA	<0.005	<0.005	<0.005	<0.005	NA
SG-12	6.0		960	NA	<0.005	<0.005	15.0	42.0	NA
SG-13	3	8/17/90	<0.1	NA	<0.005	<0.005	<0.005	<0.005	NA
SG-13	6		<0.1	NA	<0.005	<0.005	<0.005	<0.005	NA

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 (mg/kg) TPH-g	TPH-d	Benzene	Toluene	Ethyl-benzene	Xylenes	TPH-mo
SG-14	3'	9/13/90	<1.0	<1.0	<0.0025	0.0063	<0.0025	<0.0025	<10
	6'		<1.0	<1.0	0.190	0.0250	0.0170	0.037	<10
SG-15	3'	9/13/90	<1.0	<1.0	<0.0025	0.0100	<0.0025	0.0026	<10
	6'		<1.0	<1.0	<0.0025	0.0270	<0.0025	0.0039	<10
SG-16	3'	9/13/90	<1.0	<1.0	<0.0025	0.0120	<0.0025	0.0029	<10
	6'		<1.0	<1.0	<0.0025	0.0260	<0.0025	0.0036	12
SG-17	3'	9/13/90	<1.0	<1.0	<0.0025	0.0110	<0.0025	<0.0025	<10
	6'		<1.0	4.0	<0.0025	0.0073	<0.0025	<0.0025	<10

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 4. 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 5. RECOMMENDED MINIMUM VERIFICATION ANALYSES FOR UNDERGROUND TANK LEAKS

From: Tri-Regional Board Staff Recommendation for Preliminary Evaluation and Investigation of Underground Tank Sites (Revised August 10, 1990)

HYDROCARBON LEAK	SOIL ANALYSIS	WATER ANALYSIS
Unknown Fuel	TPH-g GCFID (5030)	TPH-g GCFID (5030)
	TPH-d GCFID (3550)	TPH-d GCFID (3510)
	BTEX 8020 or 8240	BTEX 602, 624 or 8260
	TPH and BTEX 8260	BTEX 602, 624 or 8260
Leaded Gas	TPH-g GCFID (5030)	TPH-g GCFID (5030)
	BTEX 8020 or 8240	BTEX 602, 624 or 8260
	TPH and BTEX 8260	BTEX 602, 624 or 8260
	TOTAL LEAD AA	TOTAL LEAD AA
	OPTIONAL	
	TEL DHS-LUFT	TEL DHS-LUFT
	EDB DHS-AB1803	EDB DHS-AB1803
Unleaded Gas	TPH-g GCFID (5030)	TPH-g GCFID (5030)
	BTEX 8020 or 8240	BTEX 602, 624 or 8260
	TPH and BTEX 8260	
Diesel	TPH-d GCFID (3550)	TPH-d GCFID (3510)
	BTEX 8020 or 8240	BTEX 602, 624 or 8260
	TPH and BTEX 8260	
Jet Fuel	TPH-d GCFID (3550)	TPH-d GCFID (3510)
	BTEX 8020 or 8240	BTEX 602, 624 or 8260
	TPH AND BTEX 8260	
Kerosene	TPH-d GCFID (3550)	TPH-d GCFID (3510)
	BTEX 8020 or 8240	BTEX 602, 624 or 8260
Fuel/Heating Oil	TPH-d GCFID (3550)	TPH-d GCFID (3510)
	BTEX 8020 or 8240	BTEX 602, 624 or 8260
Chlorinated Solvents	CL HC 8010 or 8240	CL HC 601 or 624
	BTEX 8020 or 8240	BTEX 602 or 624
	CL HC and BTEX 8260	CL HC and BTEX 8260
Non Chlorinated Solvents	TPH-d GCFID (3550)	TPH-d GCFID (3510)
	BTEX 8020 or 8240	BTEX 602 or 624
	TPH and BTEX 8260	TPH and BTEX 8260
Waste and Used Oil or Unknown	TPH-g GCFID (5030)	TPH-g 5520 C&F
	TPH-d GCFID (3550)	TPH-d GCFID (3510)
	TPH and BTEX 8260	
	O & G 5520 D&F	O & G 5520 C&F
	BTEX 8020 or 8240	BTEX 602, 624 or 8260
	CL HC 8010 or 8240	CL HC 601 or 624
	ICAP or AA TO DETECT METALS: Cd, Cr, Pb, Zn, Ni	
	METHOD 8270 FOR SOIL OR WATER TO DETECT:	
	PCB*	PCB*
	PCP*	PCP*
	PNA	PNA
	CREOSOTE	CREOSOTE

*If found analyze for dibenzofurans (PCBs) or dioxins (PCP)

TABLE 6. RESULTS OF GROUNDWATER CHEMICAL ANALYSES

Shell Oil Company Facility
285 Hegenberger Road
Oakland, California

Well No.	Date Sampled	Concentration (mg/L) TPH-g	TPH-d	Benzene	Toluene	Ethyl-Benzene	Xylenes
MW-1	02/16/89	99.0	NA	20	23	5.7	23
MW-1	05/23/89	48.0	11.0	4.2	5.2	1.2	7.7
MW-1	08/04/89	63.0	11.0	5.5	5.5	3.2	9.5
MW-1	12/15/89	30.0	11.0	<0.0005	<0.0005	<0.0005	<0.0005
MW-1	02/07/90	93.0	10.0	13.0	9.6	2.4	14.0
MW-1	04/18/90	55.0	8.7	14.0	8.4	3.2	13.0
MW-1	07/24/90	73.0	3.6	16.0	7.40	2.80	15.0
MW-1[2]	07/24/90	57.0	3.6	18.0	8.0	3.0	16.0
MW-1[2]	**10/01/90**	**45**	**1.7**	**8.0**	**4.3**	**2.0**	**11.0**
MW-2	02/16/89	20.0	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	15.0	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	13.0	4.8	0.032	0.034	0.23	0.640
MW-2	04/18/90	9.8	3.2	0.033	0.019	0.46	1.7
MW-2	07/24/90	9.6	2.7	0.041	0.027	0.540	0.940
MW-2	**10/01/90**	**0.39**	**1.6**	**0.0034**	**0.0015**	**0.0085**	**0.025**
MW-3	02/16/89	60.0	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-3	04/19/90	0.26	<0.05	<0.0005	<0.0005	<0.0005	0.0094
MW-3	07/24/90	0.51	0.21	0.046	0.0012	<0.0005	0.0093
MW-3	**09/28/90**	**0.46**	**0.35**	**0.0063**	**0.0017**	**<0.0005**	**0.015**
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[1]	03/08/90	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
MW-4	7/25/90	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
MW-4	**09/28/90**	**<0.05**	**NA**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**
MW-5	05/23/89	26.0	7.0	1.5	0.28	<0.0015	8.1
MW-5	08/04/89	12.0	8.7	0.86	0.094	<0.0015	2.6
MW-5	12/15/89	1.00	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-5	04/19/90	19.0	5.0	4.5	0.85	0.097	8.0
MW-5	07/24/90	23.0	2.7	3.6	0.400	0.160	6.50
MW-5	**09/28/90**	**5.4**	**0.55**	**1.40**	**0.026**	**0.013**	**1.30**

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

Shell Oil Company Facility
285 Hegenberger Road
Oakland, California

Well No.	Date Sampled	Concentration (mg/L) TPH-g	TPH-d	Benzene	Toluene	Ethyl-Benzene	Xylenes
MW-6	05/23/89	22.0	7.0	0.016	0.0065	0.0066	3.4
MW-6	08/04/89	28.0	8.8	1.2	0.13	2.1	2.8
MW-6	12/15/89	16.0	5.5	0.37	0.092	0.20	0.18
MW-6	02/07/90	22.0	2.6	0.52	0.085	0.63	0.77
MW-6	04/18/90	21.0	5.7	0.9	0.077	2.7	2.7
MW-6	07/24/90	24.0	3.0	1.00	0.094	3.40	2.70
MW-6[2]	**10/01/90**	**22.0**	**<0.05**	**0.70**	**0.093**	**2.50**	**2.40**
MW-7	05/23/89	47.0	11	3.5	5.0	1.5	7.8
MW-7	08/04/89	68.0	22	6.2	6.6	3.6	8.8
MW-7	12/15/89	100.0	12	4.5	5.3	1.3	5.3
MW-7	02/08/90	96.0	8.1	15.0	15.0	2.5	14.0
MW-7	04/19/90	94.0	10.0	25.0	13.0	3.3	13.0
MW-7	07/24/90	84.0	3.8	26.0	13.0	3.0	12.0
MW-7	**09/28/90**	**43.0**	**<0.05**	**25.0**	**6.10**	**2.40**	**9.00**
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-8	07/25/90	<0.05	<0.05	<0.0005	0.0013	<0.0005	<0.0005
MW-8	**09/28/90**	**<0.05**	**1.1**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**
MW-9	08/04/89	47.0	12.0	5.6	6.6	1.5	8.5
MW-9	12/15/89	88.0	9.2	4.3	5.4	0.14	5.6
MW-9	02/08/90	50.0	7.4	1.8	1.4	3.2	1.8
MW-9	04/19/90	50.0	7.5	14.0	11.0	0.73	10.0
MW-9	07/24/90	62.0	3.20	19.0	16.0	0.950	15.0
MW-9	**09/28/90**	**30.0**	**2.70**	**16.0**	**6.50**	**0.980**	**11.0**
MW-10	12/15/89	<0.05	3.1	1.5	<0.0005	<0.0005	<0.0005
MW-10	03/08/90	25.0	1.8	17	0.330	2.1	1.4
MW-10	04/19/90	23.0	3.6	15.0	1.2	0.19	3.3
MW-10	07/25/90	18.0	1.9	12.0	0.380	<0.005	1.40
MW-10	**09/28/90**	**9.5**	**0.43**	**13.0**	**0.100**	**1.80**	**0.23**

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)
Bold Indicates work completed this quarter
[1] Analyzed semi-annually
[2] Duplicate sample

TABLE 7. GROUNDWATER MONITORING INFORMATION

Shell Oil Company Facility
285 Hegenberger Road
Oakland, California

Well No.	Date Monitored	Depth to Water (ft bgs)	Groundwater Elevation (msl)	Petroleum Odor In Water	Floating Product Thickness (inches)	Comments
MW-1	02/16/89	3.83	2.81	Slight	0	----
El. 6.64	05/23/89	3.59	3.05	Slight	0	No sheen
	08/03/89	4.04	2.06	Slight	0	----
	12/15/89	4.22	2.42	Slight	0	----
	02/07/90	4.60	2.58	Slight	0	----
	04/18/90	4.02	2.62	None	0	Yellow
	07/23/90	4.17	2.47	None	0	Floating sludge
	09/27/90	**4.60**	**2.04**	**Slight**	**0**	**Yellow in color**
MW-2	02/16/89	5.33	2.35	Slight	0	----
El. 7.68	05/23/89	5.23	2.45	Slight	0	----
	08/03/89	6.03	1.65	Slight	0	----
	12/15/89	6.43	1.25	Strong	0	----
	02/07/90	5.82	1.86	Slight	0	No sheen
	04/18/90	5.88	1.80	None	0	Yellow
	07/23/90	6.05	1.63	Slight	0	
	09/27/90	**6.82**	**0.86**	**Strong**	**0**	**None**
MW-3	02/16/89	5.17	2.64	None	0	----
El. 7.81	05/23/89	5.09	2.72	None	0	----
	08/03/89	5.34	2.47	Slight	0	----
	12/15/89	6.02	1.79	None	0	----
	3/08/90	4.95	2.86	Moderate	0	Cloudy
	04/18/90	5.55	2.26	Slight	0	Clear
	07/23/90	5.81	2.00	None	0	Floating sludge
	09/27/90	**6.86**	**0.95**	**None**	**0**	**None**
MW-4	05/23/89	5.60	1.78	None	0	----
El. 7.38	08/03/89	6.37	1.01	None	0	----
	12/15/89	6.91	0.47	Slight	0	----
	03/08/90	6.06	1.32	Moderate	0	Greenish
	04/18/90	5.84	1.54	None	0	No sample taken
	07/23/90	6.92	0.46	None	0	
	07/23/90	6.92	0.46	None	0	No sample taken
	09/27/90	**8.03**	**-0.65**	**None**	**0**	**None**

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)	Groundwater Elevation (msl)	Petroleum Odor In Water	Floating Product Thickness (inches)	Comments
MW-5	05/23/89	5.47	2.71	Moderate	0	No sheen
El. 8.18	08/03/89	5.94	2.24	None	0	----
	12/15/89	6.75	1.43	None	0	----
	02/07/90	6.03	2.15	Slight	0	Clear
	04/18/90	5.80	2.38	Slight	0	Clear
	07/23/90	6.00	2.18	None	0	
	09/23/90	**7.18**	**1.00**	**Slight**	**0**	**Putrid odor**
MW-6	05/23/89	5.47	2.74	Strong	0	Sheen
El. 8.21	08/03/89	5.91	2.30	None	0	
	12/15/89	5.98	2.23	Moderate	0	----
	02/07/90	5.47	2.74	Moderate	0	----
	04/18/90	5.80	2.41	Slight	0	Clear
	07/23/90	5.85	2.36	Slight	0	
	09/27/90	**6.42**	**1.79**	**Slight**	**0**	**Putrid odor**
MW-7	05/23/89	5.48	1.96	Moderate	0	Slight sheen
El. 7.44	08/03/89	4.22	3.22	None	0	----
	12/15/89	4.58	2.86	Slight	0	----
	02/07/90	5.34	2.10	Slight	0	Brownish
	04/18/90	4.92	2.52	Slight	0	Organic, Dark Yellow
	07/23/90	4.99	2.45	Slight	0	Floating sludge, putrid odor
	09/27/90	**6.16**	**1.28**	**Slight**	**0**	**Decaying odor**
MW-8	05/23/89	6.62	1.17	None	0	----
El. 7.79	08/03/89	6.62	1.17	None	0	----
	12/15/89	6.71	1.08	None	0	----
	03/08/90	4.95	2.84	Moderate	0	Milky
	04/18/90	6.40	1.89	None	0	No sample taken
	07/23/90	6.62	1.17	None	<0.25"	Floating sludge
	09/27/90	**6.98**	**0.81**	**Slight**	**0**	**Decaying odor**
MW-9	08/03/89	5.78	1.85	None	0	----
El. 7.63	12/15/89	5.24	2.39	None	0	----
	02/07/90	5.23	2.40	Organic Odor	0	Yellow
	04/18/90	5.34	2.29	Slight	0	Yellowish
	07/23/90	5.65	1.98	Organic Odor	0	
	09/27/90	**5.96**	**1.67**	**Organic Odor**	**0**	**Yellowish**

TABLE 7 (cont'd). GROUNDWATER MONITORING INFORMATION

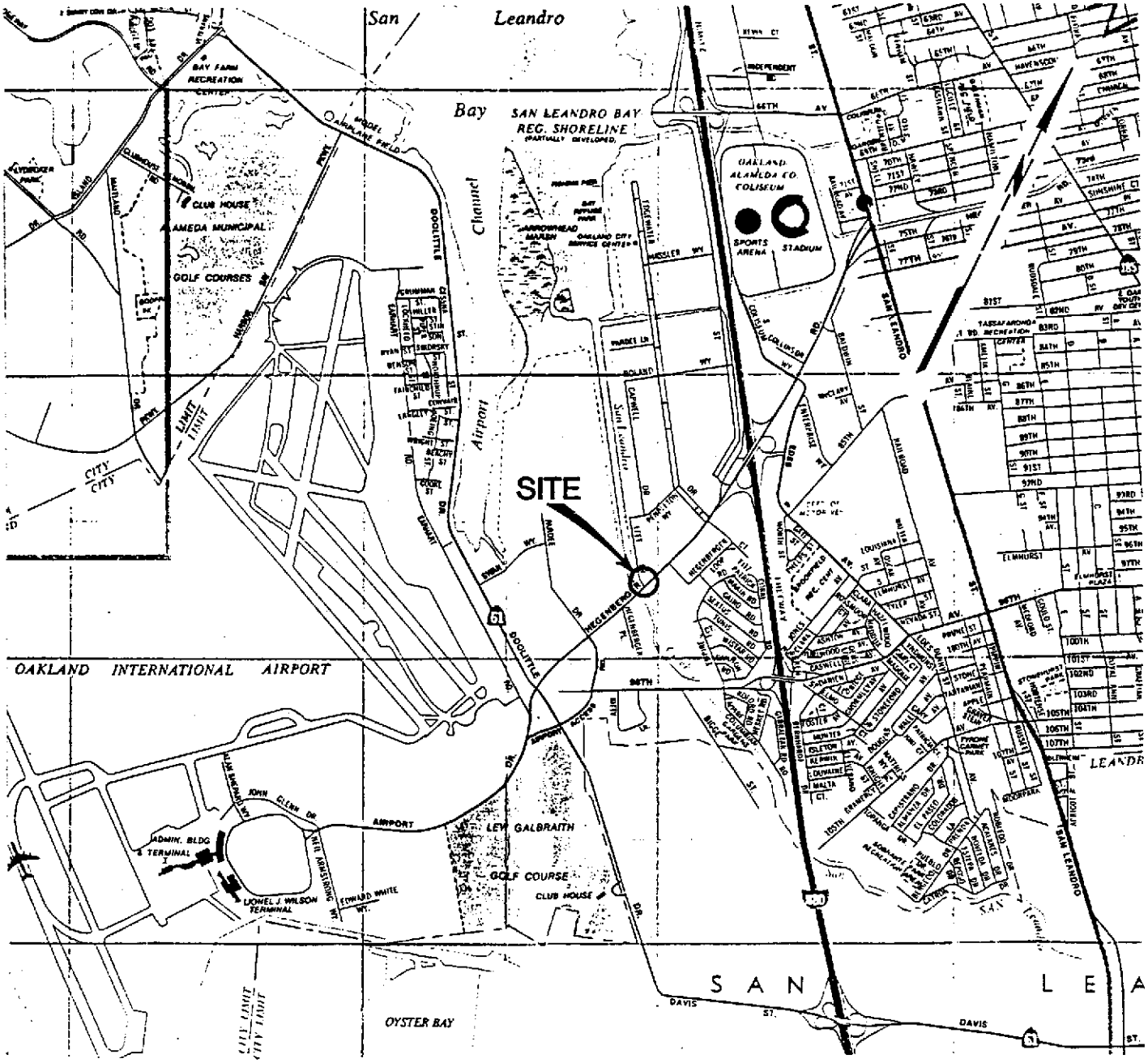
Shell Oil Company Facility
285 Hegenberger Road
Oakland, California

Well No.	Date Monitored	Depth to Water (ft bgs)	Groundwater Elevation (msl)	Petroleum Odor In Water	Floating Product Thickness (inches)	Comments
MW-10	12/15/89	6.33	0.82	None	0	----
El. 7.45	3/08/90	5.41	2.00	Strong	0	Clear
	04/18/90	5.60	1.85	Slight	0	No silt, Lt. Yellow
	07/23/90	5.81	1.64	None	0	Floating sludge
	09/27/90	**6.64**	**0.81**	**Slight**	**0**	**Clear**

NOTES:

ft bgs feet below ground surface
Elevations are in feet above Mean Sea Level
Bold indicates work completed this quarter

DRAWINGS



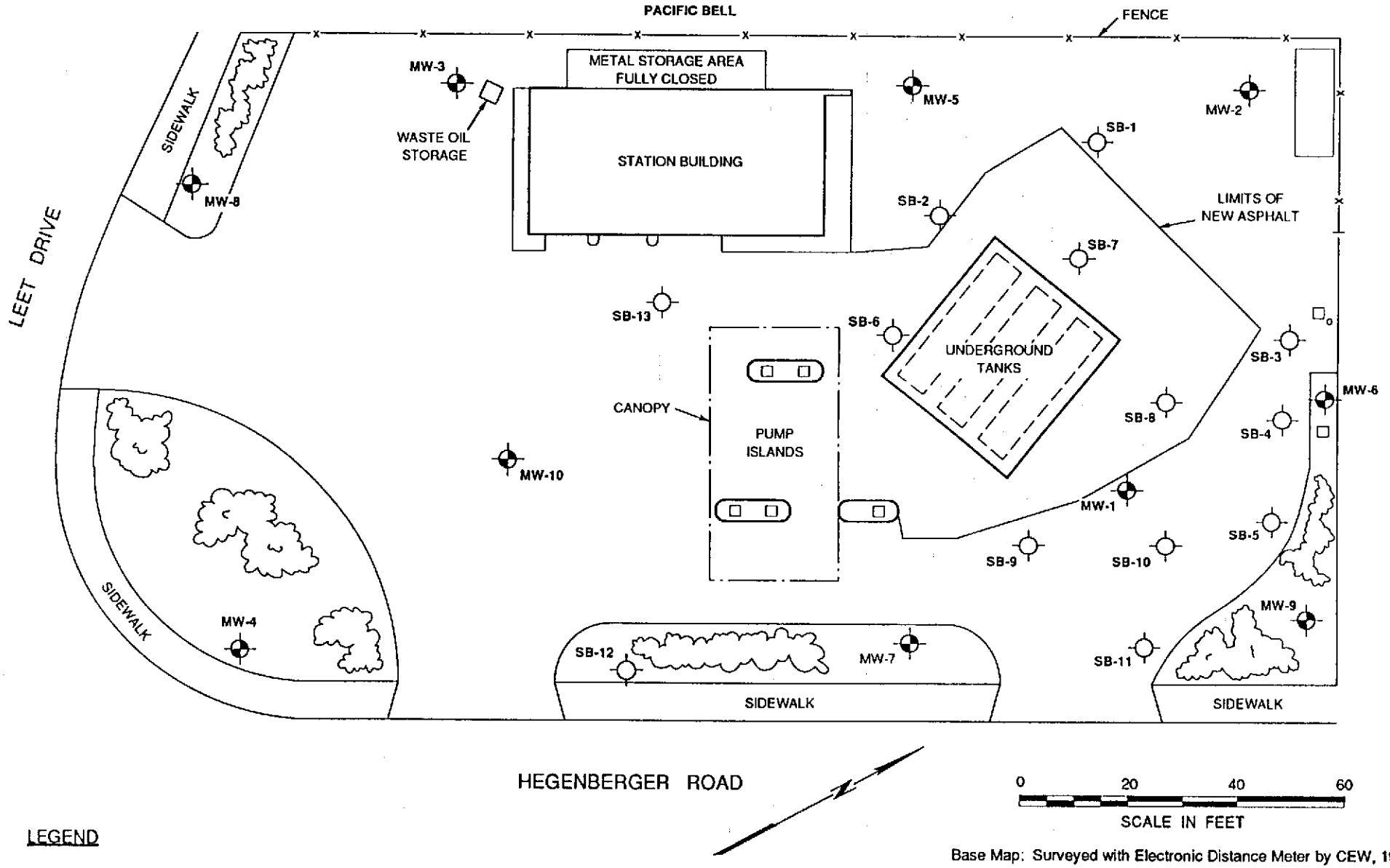
SOURCE: California State Automobile Association

SITE LOCATION

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

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

Converse Environmental West



LEGEND

SB-1 — SOIL BORING (locations approximate)

MW-1 — GROUNDWATER MONITORING WELL

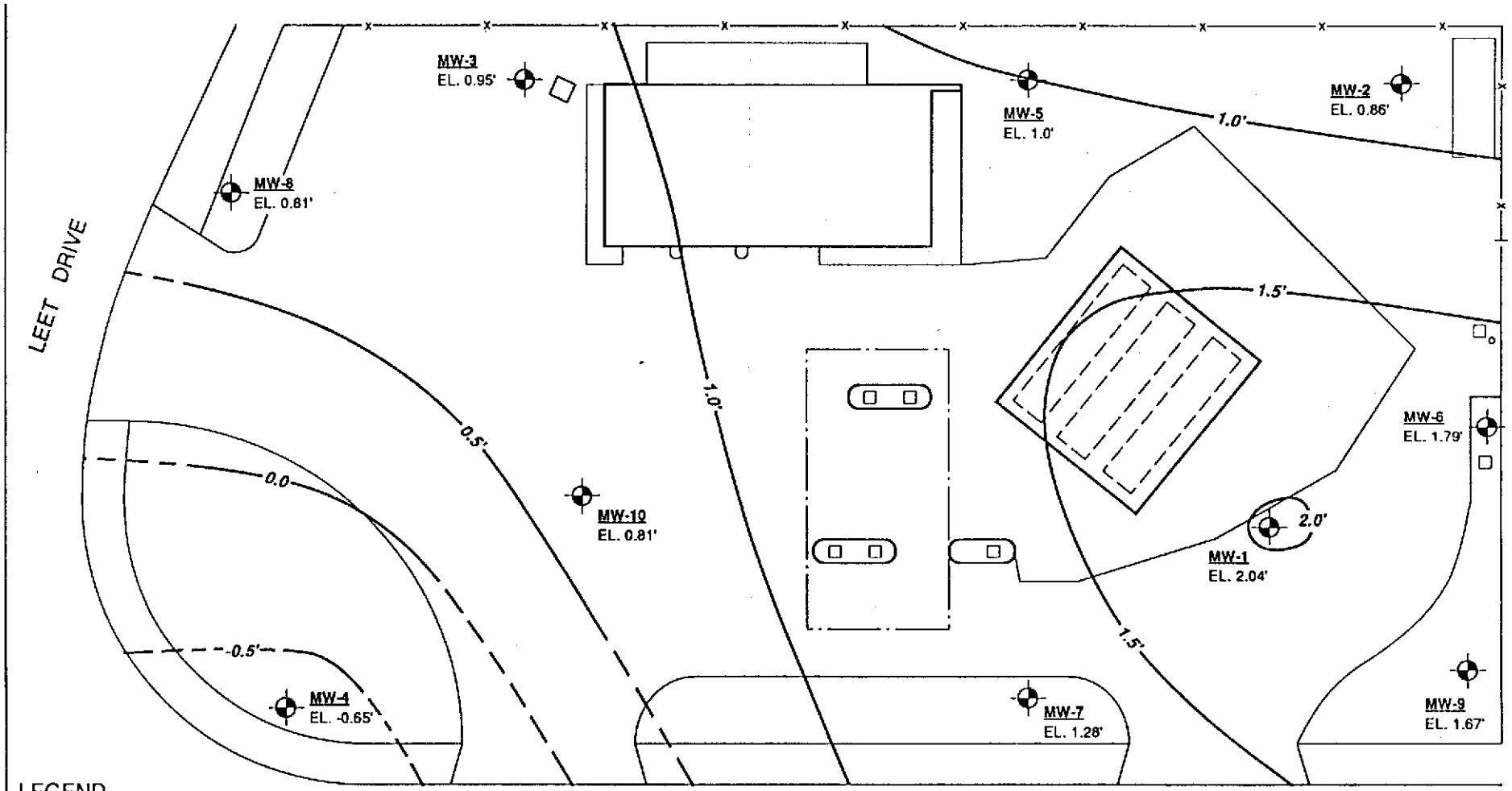
Base Map: Surveyed with Electronic Distance Meter by CEW, 1989.

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	12/7/90
Checked by	GLS
Drawing No.	2
Approved by	CRC



LEGEND

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

MW-1 GROUNDWATER MONITORING WELL SHOWING GROUNDWATER ELEVATION

NOTE: 1. GROUNDWATER ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL

2. GROUNDWAETR FLOW DIRECTION IS NOT SPECIFIED DUE TO IRREGULAR RESPONSE TO TIDAL EFFECTS

HEGENBERGER ROAD

0 20 40 60

SCALE IN FEET

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

GROUNDWATER CONTOUR MAP Q4/90

SHELL OIL COMPANY
285 Hegenberger Road
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Project No.	88-44-359-20
Prepared by	LQL
Date	12/7/90
Checked by	GLS
Drawing No.	3
Approved by	CRC

APPENDIX A

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 MW-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.
4/90	CEW applied for an encroachment permit from the City of Oakland.
4/18/90 and 4/19/90	CEW sampled wells MW-1, MW-2, MW-3, MW-5, MW-7, MW-9, MW-10.

Boldface items were conducted during this quarter

CHRONOLOGICAL SUMMARY (continued)

Date	Description of Activity
7/24/90 and 7/25/90	CEW sampled wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9 and MW-10.
8/06/90 and 8/07/90	CEW drilled and sampled SG-1 through SG-13.
9/07/90	CEW performed constant head test on monitoring wells MW-1, MW-5, MW-6, MW-7, MW-9, and MW-10.
9/13/90	CEW drilled and sampled SG-14 through SG-17.
9/27/90-10/01/90	**CEW monitored and sampled monitoring wells MW-1 through MW-10.**

Boldface items were conducted during this quarter

APPENDIX B

LABORATORY REPORTS AND CHAIN-OF-CUSTODY FORMS

NET NATIONAL ENVIRONMENTAL TESTING, INC.®

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

Chuck Comstock
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

Date: 10-15-90
NET Client Acct. No: 18.02
NET Pacific Log No: 4115
Received: 10-02-90 0800

Client Reference Information

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

SAMPLE DESCRIPTION: field blank 09-28-90 0910
LAB Job No: (-64252)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		10-03-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		10-03-90	
Benzene	0.5	0.7	ug/L
Ethylbenzene	0.5	ND	ug/L
Toluene	0.5	2.1	ug/L
Xylenes, total	0.5	1.2	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		10-04-90	
DATE ANALYZED		10-05-90	
METHOD GC FID/3510		--	
as Diesel	0.05	ND	mg/L
as Motor Oil	0.5	ND	mg/L

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

SAMPLE DESCRIPTION: trip bk.9/2409-24-90
LAB Job No: (-64253)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		10-03-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		10-03-90	
Benzene	0.5	ND	ug/L
Ethylbenzene	0.5	ND	ug/L
Toluene	0.5	ND	ug/L
Xylenes, total	0.5	ND	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		10-04-90	
DATE ANALYZED		10-05-90	
METHOD GC FID/3510		--	
as Diesel	0.05	ND	mg/L
as Motor Oil	0.5	ND	mg/L

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

SAMPLE DESCRIPTION: MW-3 09-28-90 1000
LAB Job No: (-64254)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		10-03-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	0.46	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		10-03-90	
Benzene	0.5	6.3	ug/L
Ethylbenzene	0.5	ND	ug/L
Toluene	0.5	1.7	ug/L
Xylenes, total	0.5	15	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		10-04-90	
DATE ANALYZED		10-05-90	
METHOD GC FID/3510		--	
as Diesel	0.05	0.35	mg/L
as Motor Oil	0.5	ND	mg/L

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 4115

Date: 10-15-90
Page: 5

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

SAMPLE DESCRIPTION: MW-8 09-28-90 1020
LAB Job No: (-64255)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		10-03-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		10-03-90	
Benzene	0.5	ND	ug/L
Ethylbenzene	0.5	ND	ug/L
Toluene	0.5	ND	ug/L
Xylenes, total	0.5	ND	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		10-04-90	
DATE ANALYZED		10-05-90	
METHOD GC FID/3510		--	
as Diesel	0.05	1.1	mg/L
as Motor Oil	0.5	ND	mg/L

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 4115

Date: 10-15-90
Page: 6

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

SAMPLE DESCRIPTION: MW-10 09-28-90 1035
LAB Job No: (-64256)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		10	
DATE ANALYZED		10-04-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	9.5	mg/L
METHOD 602		--	
DILUTION FACTOR *		10	
DATE ANALYZED		10-04-90	
Benzene	0.5	13,000	ug/L
Ethylbenzene	0.5	1,800	ug/L
Toluene	0.5	100	ug/L
Xylenes, total	0.5	230	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		10-04-90	
DATE ANALYZED		10-05-90	
METHOD GC FID/3510		--	
as Diesel	0.05	0.43	mg/L
as Motor Oil	0.5	ND	mg/L

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

SAMPLE DESCRIPTION: MW-5 09-28-90 1100
LAB Job No: (-64257)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		10	
DATE ANALYZED		10-04-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	5.4	mg/L
METHOD 602		--	
DILUTION FACTOR *		10	
DATE ANALYZED		10-04-09	
Benzene	0.5	1,400	ug/L
Ethylbenzene	0.5	13	ug/L
Toluene	0.5	26	ug/L
Xylenes, total	0.5	1,300	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		2	
DATE EXTRACTED		10-04-90	
DATE ANALYZED		10-07-90	
METHOD GC FID/3510		--	
as Diesel	0.05	0.55	mg/L
as Motor Oil	0.5	ND	mg/L

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 4115

Date: 10-15-90
Page: 8

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

SAMPLE DESCRIPTION: MW-9 09-28-90 1130
LAB Job No: (-64258)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		20	
DATE ANALYZED		10-04-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	30	mg/L
METHOD 602		--	
DILUTION FACTOR *		500	
DATE ANALYZED		10-05-90	
Benzene	0.5	16,000	ug/L
Ethylbenzene	0.5	980	ug/L
Toluene	0.5	6500	ug/L
Xylenes, total	0.5	11,000	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		2	
DATE EXTRACTED		10-04-90	
DATE ANALYZED		10-07-90	
METHOD GC FID/3510		--	
as Diesel	0.05	2.7	mg/L
as Motor Oil	0.5	ND	mg/L

Client Acct: 18.02 Date: 10-15-90
Client Name: Converse Consultants Page: 9
NET Log No: 4115

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

SAMPLE DESCRIPTION: MW-7 09-28-90 1150
LAB Job No: (-64259)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		25	
DATE ANALYZED		10-04-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	43	mg/L
METHOD 602		--	
DILUTION FACTOR *		1000	
DATE ANALYZED		10-05-90	
Benzene	0.5	25,000	ug/L
Ethylbenzene	0.5	2400	ug/L
Toluene	0.5	6100	ug/L
Xylenes, total	0.5	9000	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		10-04-90	
DATE ANALYZED		10-05-90	
METHOD GC FID/3510		--	
as Diesel	0.05	ND	mg/L
as Motor Oil	0.5	ND	mg/L

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

SAMPLE DESCRIPTION: trip bk.10-109-24-90
LAB Job No: (-64260)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		10-03-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	0.08	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		10-03-90	
Benzene	0.5	4.1	ug/L
Ethylbenzene	0.5	1.1	ug/L
Toluene	0.5	2.2	ug/L
Xylenes, total	0.5	5.6	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		10-04-90	
DATE ANALYZED		10-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	ND	mg/L
as Motor Oil	0.5	ND	mg/L

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

SAMPLE DESCRIPTION: MW-6 10-01-90 1455
LAB Job No: (-64261)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		100	
DATE ANALYZED		10-03-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	22	mg/L
METHOD 602		--	
DILUTION FACTOR *		100	
DATE ANALYZED		10-03-90	
Benzene	0.5	700	ug/L
Ethylbenzene	0.5	2500	ug/L
Toluene	0.5	93	ug/L
Xylenes, total	0.5	2400	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		10-04-90	
DATE ANALYZED		10-05-90	
METHOD GC FID/3510		--	
as Diesel	0.05	ND	mg/L
as Motor Oil	0.5	ND	mg/L

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

SAMPLE DESCRIPTION: 901001 10-01-90 1500
LAB Job No: (-64262)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		20	
DATE ANALYZED		10-04-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	22	mg/L
METHOD 602		--	
DILUTION FACTOR *		20	
DATE ANALYZED		10-04-90	
Benzene	0.5	840	ug/L
Ethylbenzene	0.5	2900	ug/L
Toluene	0.5	78	ug/L
Xylenes, total	0.5	2500	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		2	
DATE EXTRACTED		10-04-90	
DATE ANALYZED		10-07-90	
METHOD GC FID/3510		--	
as Diesel	0.05	2.6	mg/L
as Motor Oil	0.5	ND	mg/L

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

SAMPLE DESCRIPTION: MW-1 10-01-90 1530
LAB Job No: (-64263)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		100	
DATE ANALYZED		10-04-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	45	mg/L
METHOD 602		--	
DILUTION FACTOR *		500	
DATE ANALYZED		10-05-90	
Benzene	0.5	8000	ug/L
Ethylbenzene	0.5	2000	ug/L
Toluene	0.5	4300	ug/L
Xylenes, total	0.5	11,000	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		10-04-90	
DATE ANALYZED		10-05-90	
METHOD GC FID/3510		--	
as Diesel	0.05	1.7	mg/L
as Motor Oil	0.5	ND	mg/L

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

SAMPLE DESCRIPTION: MW-2 10-01-90 1545
LAB Job No: (-64264)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		10-03-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	0.39	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		10-03-90	
Benzene	0.5	3.4	ug/L
Ethylbenzene	0.5	8.5	ug/L
Toluene	0.5	1.5	ug/L
Xylenes, total	0.5	25	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		2	
DATE EXTRACTED		10-04-90	
DATE ANALYZED		10-07-90	
METHOD GC FID/3510		--	
as Diesel	0.05	1.6	mg/L
as Motor Oil	0.5	ND	mg/L

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

SAMPLE DESCRIPTION: MW-4 09-28-90 1050
LAB Job No: (-64265)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		10-03-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		10-03-90	
Benzene	0.5	ND	ug/L
Ethylbenzene	0.5	ND	ug/L
Toluene	0.5	ND	ug/L
Xylenes, total	0.5	ND	ug/L

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

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Gasoline	0.05	mg/L	113	ND	104	106	1.9
Benzene	0.5	ug/L	90	ND	87	90	3.4
Toluene	0.5	ug/L	90	ND	95	96	1.0

COMMENT: Blank Results were ND on other analytes tested.

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Gasoline	0.05	mg/L	115	ND	109	107	1.9
Toluene	0.5	ug/L	104	ND	100	98	2.0
Benzene	0.5	ug/L	98	ND	103	97	6.0

COMMENT: Blank Results were ND on other analytes tested.

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Diesel	0.05	mg/L	103	ND	75	82	8.9
Motor Oil	0.5	mg/L	105	ND	N/A	N/A	N/A

KEY TO ABBREVIATIONS and METHOD REFERENCES

<	:	Less than; When appearing in results column indicates analyte not detected at the value following. This datum supercedes the listed Reporting Limit.
*	:	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 (but do not multiply reported values).
ICVS	:	Initial Calibration Verification Standard (External Standard).
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 100 through 493: see "Methods for Chemical Analysis of Water & Wastes", U.S. EPA, 600/4-79-020, rev. 1983.

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.

SM: see "Standard Methods for the Examination of Water & Wastewater, 16th Edition, APHA, 1985.

AFE # 204-5508-5504
WIC # 086662
Exp Code - 5440
P.M. = CEC

CONVERSE ENVIRONMENTAL WEST

CHAIN OF CUSTODY RECORD

PROJECT NO.: 88-44-359-20
SAMPLERS: (Signature) Eric Soerksen
PROJECT NAME / CROSS STREET: 285 Hegenberger SHELL

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	ANALYSES: Tph-d	Tph-g	BTEX				REMARKS
MW-5	9/28/90	11:00		✓	1 litre Amber	2	✓						4115
MW-5		11:00		✓	40 ml VOA	3		✓	✓				Standard Turnaround Time
MW-9		11:30		✓	1 litre Amber	2	✓						
MW-9		11:30		✓	40 ml VOA	3		✓	✓				Detection Limits
MW-7		11:50		✓	1 litre Amber	2	✓						
MW-7	↓	11:50		✓	40 ml VOA	3		✓	✓				Tph-d = 0.05 ppm Tph-g = 0.05 ppm BTEX = 0.0005 ppm

RELINQUISHED BY: (Signature) Eric Soerksen	DATE: 10/1/90 TIME: 1745	RECEIVED BY: (Signature) Jeff Winkler	RELINQUISHED BY: (Signature) Jeff Winkler	DATE: 10/1 TIME:	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		SHIPPED BY: (Signature)	RECEIVED FOR LAB: (Signature) J Schwartz	DATE: 10/2/90 TIME: 0800	COURIER FROM AIRPORT: (Signature)

Wic # 0866602
Afe # 204-5508-5504
Exp Code 5440
PM = CRC

CONVERSE ENVIRONMENTAL WEST

CHAIN OF CUSTODY RECORD

PROJECT NO.: 88-44-359-20
PROJECT NAME / CROSS STREET: 285 Hegenberger SHELL
SAMPLERS: (Signature) Tina Soerksen

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	ANALYSES: Tph-d	Tph-g	BTEX				REMARKS
													4115
Trip Blank	10/1/90	9/24/90		✓	1 litre Amber	1	✓						Standard Turnaround Time
Trip Blank		9/24/90		✓	40 ml VOA	1		✓	✓				
MW-6		2:55		✓	1 litre Amber	2	✓						
MW-6		2:55		✓	40 ml. VOA	3		✓	✓				Detection Limits:
901001		3:00		✓	1 litre Amber.	2	✓						
901001		3:00		✓	40 ml VOA	3		✓	✓				Tph-d = 0.05 ppm
MW-1		3:30		✓	1 litre Amber.	2	✓						Tph-g = 0.05 ppm
MW-1		3:30		✓	40 ml VOA	3		✓	✓				BTEX = 0.0005 ppm
MW-2		3:45		✓	1 litre Amber	2	✓						
MW-2	↓	3:45		✓	40 ml. VOA	3		✓	✓				

RELINQUISHED BY: (Signature) Tina Soerksen	DATE: 10/1/90 TIME: 17:45	RECEIVED BY: (Signartue) Jeff Wickham	RELINQUISHED BY: (Signature) Jeff Wickham	DATE: 10/1 TIME:	RECEIVED BY: (Signature)
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		SHIPPED BY: (Signatue)	RECEIVED FOR LAB: (Signature)	DATE: 10/2/90 TIME: 0866	COURIER FROM AIRPORT: (Signature)

Wic # 204-5508-550
Afe # 086662
Exp Code 5440

P.M. = CRC

CONVERSE ENVIRONMENTAL WEST

CHAIN OF CUSTODY RECORD

PROJECT NO.: 88-44-359-20

PROJECT NAME / CROSS STREET: 285 Hegenberger SHELL

SAMPLERS: (Signature) Tina Soeken

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	ANALYSES: Tph-d	Tph-g	BTEX				REMARKS
													4115
Field Blank	9/24/90	9:10		✓	1 litre Amber	1	✓						Standard Turnaround
Field Blank		9:10		✓	40 ml VOA	1		✓	✓				Time
Trip Blank		9/24/90		✓	1 litre Amber	1	✓						
Trip Blank		9/24/90		✓	40 ml VOA	1		✓	✓				Detection Limits:
MW-3		10:00		✓	1 litre Amber	3	✓						
MW-3		10:00		✓	40 ml VOA	4		✓	✓				Tph-g = 0.05 ppm
MW-8		10:20		✓	1 litre Amber	2	✓						Tph-d = 0.05 ppm
MW-8		10:20		✓	40 ml VOA	3		✓	✓				BTEX = 0.0005 ppm
MW-10		10:35		✓	1 litre Amber	2	✓						
MW-10		10:35		✓	40 ml VOA	3		✓	✓				
~~MW-4~~		~~10:50~~		✓	~~1 litre Amber~~	~~2~~	✓						~~TSo~~
MW-4		10:50		✓	40 ml VOA	3		✓	✓				
	↓			✓									custody seal 10/1/90 @ 19:30

RELINQUISHED BY : (Signature)	DATE : 10/1/90	RECEIVED BY : (Signartue)	RELINQUISHED BY : (Signature)	DATE : 10/	RECEIVED BY : (Signature)
Tina Soeken	TIME : 17:45	Jeff Winkler	Jeff Winkler	TIME :	
RELINQUISHED BY : (Signature)	DATE :	RECEIVED BY : (Signartue)	RELINQUISHED BY : (Signature)	DATE :	RECEIVED BY : (Signature)
	TIME :			TIME :	
RELINQUISHED BY COURIER: (Sign.)	DATE :	RECEIVED BY MOBILE LAB : (Sign.)	RELINQ. BY MOBILE LAB : (Signatue)	DATE :	RECEIVED BY COURIER : (Signature)
	TIME :			TIME :	
METHOD OF SHIPMENT		SHIPPED BY : (Signatue)	RECEIVED FOR LAB : (Signature) J. Schwartz	DATE : 10/2/90	COURIER FROM AIRPORT : (Signature)
				TIME : 0800	