Converse Environmental Consultants California

55 Hawthorne Street, Suite 500
San Francisco, California 94105

Telephone **415 543-4200**
FAX 415 777-3157

July 7, 1989
88-44-361-01-124

Mr. Scott Hugenberger
Water Resource Control Engineer
San Francisco Bay Regional Water Quality Control Board
1111 Jackson Street, Sixth Floor
Oakland, California 94621

Subject: Shell Oil Company - Quarterly Report
500 40th Street
Oakland, California 94609

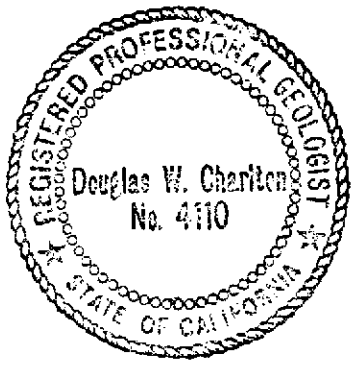
Dear Mr. Hugenberger:

Enclosed please find one copy of the Shell Oil Company Quarterly Report of Activities for Quarter 2, 1989 prepared by Converse Environmental Consultants California - (San Francisco).

Please call if you have any questions.

Very truly yours,

Converse Environmental Consultants California

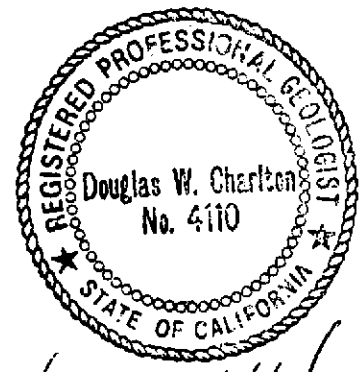


Douglas W. Charlton
California Registered Geologist #4110
DWC:fs
enclosure

cc: Ms. Diane Lundquist - Shell Oil Company - (w/encl.)
Mr. Rafat Shahid - Alameda County Health - (w/encl.)
Ms. Robin Breuer - CECC - (w/encl.)

500 40TH ST\HUGENBERGER.124

Converse Environmental Consultants California



REPORT OF ACTIVITIES

SHELL OIL COMPANY FACILITY
500 40th Street
Oakland, California

For Quarter 2, 1989
Submitted: July 10, 1989

RWQCB Representative:	Mr. Scott Hugenberger Waste Water Control Engineer
LIA Representative:	Mr. Rafat Shahid Alameda County Health Services Agency
Shell Engineer:	Ms. Diane Lundquist Environmental Engineer
Converse Project Manager:	Douglas W. Charlton, Project Manager 55 Hawthorne Street, Suite 500 San Francisco, California 94105 (415) 543-4200
Registered Geologist in Charge:	Douglas W. Charlton, Principal Geologist 55 Hawthorne Street, Suite 500 San Francisco, California 94105 (415) 543-4200
Site Owner:	Shell Oil Company

1. SITE DESCRIPTION

1.1 Maps

Vicinity Map: See Drawing 1
Plot Plan: See Drawing 2

1.2 Neighborhood Topography

Slopes gently westward towards San Francisco.

1.3 Primary Surface Waters Nearby

San Francisco Bay is located approximately 1.5 miles to the west.

1.4 Water Table Information

Q2/89 Depth to Water: Approximately 15' below grade.
Depth to Highest High Water: Approximately 11' below grade by redox boundary in soils.

2. INVESTIGATION HISTORY

2.1 Soil Borings Drilled to Period Start

B-1 through B-11 (IT 1982-84)

2.2 Soil Borings Abandoned to Period Start

None.

2.3 Groundwater Wells Drilled to Period Start

B-1 through B-11 (IT 1982-84)

2.4 Groundwater Wells Abandoned to Period Start

B-6 was abandoned by IT in June, 1986. No records are available for abandonment of the other B-series wells. These wells are covered with pavement or buildings, and they can not be located.

2.5 Investigative History Summary

TABLE 1: Chronological Summary

DATE	DESCRIPTION OF ACTIVITY
7/82	IT installed 8 six inch diameter groundwater monitoring wells to 30 feet bgs. onsite. The wells were screened from 5 to 30 feet bgs. Combustible vapors were detected in the storm sewer system in the BART Station across the street.
7/82	IT Progress Report 1: Well installations and constructions were reported, and free product was noted in wells B-7 and B-8. Groundwater gradient was shown to be westward, towards the BART Station. (See Attachment 1 for well construction diagrams.)
11/82	IT Progress Report 6: Groundwater gradient still towards well B-3. From September 1 to November 19, 1982, IT removed 35 pints of product from B-4. Well TOCs were re-surveyed and groundwater gradient was confirmed toward B-3. Maximum product thickness was in B-4, at several inches.
12/82	IT Progress Report 7: Product thickness increased in B-3 in apparent response to rising water table. Product in B-4 remained at several inches.
1/83	IT Progress Report 8: Product in B-4 had diminished to film thickness.
2/83	IT Progress Report 9: Rainfall records were researched, and the relationship between rainfall, water table and product removed was charted by graph. Amount of product in B-4 appeared to vary inversely with water table; as water table rose with winter rains, the amount product in B-4 dropped. IT proposed that product was displaced downgradient as water table rose.
3/83	IT Progress Report 10: Vapor concentrations of TPH (expressed as percent lower explosive limit) were rising in wells B-1, B-2, B-3 and B-7. No product was measurable in B-4.
6/83	Rapid reappearance of product in well B-4, from negligible in May to 4+ feet by June 30 and 6.34 feet on July 15. Increase was also measured B-3, to a thickness of 0.66 feet in July. IT concluded that a reservoir of product existed in the tank backfill, and that as water table dropped in summer time this reservoir was allowed to escape by way of gravel lenses which were saturated at high water table seasons.
7/83	IT installed 8 inch diameter monitoring wells B-9 and B-10 to 20 feet bgs in native soils next to the tank backfill.
8/83	IT Progress Report 11: IT repeated the concept that product was released in surges through gravel lenses exposed to the water table during summer.
8/83	IT installed groundwater monitoring well B-11 and sand backfill in the southwest corner of the tank bed. No free-flowing product was encountered in this well.
9/83	IT drilled two 18 inch diameter borings to 30 feet bgs and completed same as 12 inch diameter recovery wells with screen intervals from 5 to 30 feet bgs. These wells, R-1 and R-2, were located near wells B-3 and B-4, directly west of the tank backfill.
10/83	IT purged and developed wells R-1 and R-2, holding a strong depression on the water table for 2 hours.
11/83	According to IT reference, the tanks were removed and, as part of this excavation wells R-1 and R-2 were also removed. No information was provided on tank excavation or associated soils/groundwater testing and reporting to regulatory agencies.
1/84	IT Progress Report 13: Wells B-3 and B-4 continued to contain measurable product, to thicknesses of 2 feet. In general, product thicknesses decreased during December and January. Product thicknesses also decreased after tank removal. Groundwater piezometric map showed a west-trending, low area encompassing wells R-1, R-2, B-3 and B-4. This extended offsite, suggesting a paleodrainage which controlled product collection and migration offsite.

TABLE 1

CHRONOLOGICAL SUMMARY

Continued

Date	Description of Activity
5/84	IT Report: The thicknesses of product in B-3 and B-4 measured from several inches to one foot during the period January to May 1984.
7/84	IT Report: Product thicknesses increased starting in mid-May in response to lowering water tables. This pattern was similar to the pattern observed in 1983.
8/84	IT Report: The thickness of product in B-3 remained one foot, while the amount of product in B-4 decreased. IT recommended looking for possible upgradient offsite sources.
9/84	IT Report: The thickness of product in B-4 started to increase (still at less than one inch) while the thickness of product in B-3 decreased (still on the order of one foot).
10/84	IT Report: New construction was noted.
1/85	IT Report: The thickness of product of B-3 had decreased to several inches and B-4 contained negligible measurable product. This pattern of decreasing product in the winter (high water table) months was consistent with that observed in the winters of 1982-83, and 1983-84.
2/85	IT Report: Significant measurable gasoline (1.64 feet) was discovered in B-8. The gasoline appeared degraded and "old". IT concluded that this gasoline could be from the same source as that contributing to observed in wells B-3 and B-4.
6/85	IT Report: Product thicknesses in B-3, B-4 and B-8 decreased from January to mid-May, with a dramatic decrease in B-8. IT repeated its interpretation that product thickness decreased as water tables rose and increased as water tables fell. IT further proposed that the product was trapped in permeable lenses, and migrated to different geographic areas as the water tables rose and fell.
12/85	IT Report: The thickness of product in B-3 increased to approximately 2 feet during the summer, showing the seasonal increase of prior years period. Simultaneously, no product was measured in B-8 after June 3, and product reappeared in B-2 in September and October. Product thickness in B-4 fluctuated at less than one foot thick during this period. IT recommended installing a recovery extraction trench along the west boundary of the property.
5/86	IT Quarterly Report: Product thickness decreased in wells B-3 and B-4 in response to seasonal rise in the water table.
6/86	IT requested permission to abandon B-6.
7/86	IT stated that Shell planned to remove the underground storage tanks in the near future.
8/86	IT Quarterly Report: IT noted seasonal decline in water table and negligible measurable product in wells B-2 and B-4, with approximately 2 feet of floating product in B-3.
9/86	A groundwater sample from B-3 contained volatile organics: 0.90 ppm; benzene: 0.32 ppm; toluene: 0.23 ppm; xylene: 0.16 ppm.
1/4/87(?)	A commercial shopping center building was erected on the property, covering wells B-2, B-6, B-7, B-9 and B-10. Wells B-1, B-3, B-4, B-5 and B-8 were covered by site parking and a rear driveway.

3. WORK COMPLETED THIS PERIOD

3.1 Introduction

Work initiated and completed during the quarter followed the task descriptions and modifications of the site Work Plan dated April 5, 1989. The relative timing and schedule of these activities is shown in summary in the Critical Path for the project (Drawing 3).

At the outset of fieldwork, an attempt was made to find former wells not located under the shopping center (B-1, B-3, B-4, B-5 and B-8) using ground penetrating radar. This work followed Tasks 12 and 13 of the project Work Plan (see Drawing 3). No wells were found using this method, so new wells were installed, as described below.

3.2 Soil Boring Drilling/Sampling

A total of three soil borings were drilled, sampled and abandoned following the protocols described in Appendices A and B. Soil cuttings were handled by Crosby Overton, following task procedures described in Appendix G. Boring logs are enclosed as Attachment 1. A summary of soil boring activities is presented in Table 2.

TABLE 2: Summary of Soil Borings Drilled

Boring No.	Date Drilled	T.D. (ft. bgs.)	Unsaturated Soil Samples (ft. bgs)	Saturated Soil Samples (ft. bgs)	Highest OVM**
MW-2	**5/22/89**	**25**	**5,10,15**	**None**	**1000 at 11'**
MW-3	**5/23/89**	**21**	**5,10,15**	**None**	**750 at 11'**
MW-4	**5/23/89**	**20**	**5,10**	**15**	**Not taken***

* Equipment difficulties
** ppm total volatile hydrocarbons

3.3 Well Installations

Three groundwater monitoring wells were installed, developed and sampled following the protocols in Appendices C, D and E. All wells were installed as 4-inch diameter filter-packed PVC wells through hollow-stem auger drilling equipment. Boring logs and as-built well construction diagrams of wells installed to date are included as Attachment 1. A summary of these well installations is provided in Table 3.

TABLE 3: Summary of Groundwater Monitoring Well Installations

Well No.	Date Installed	Diameter Well (in.)	Initial Water Table (ft. bgs)	Static Water Table (ft. MSL)	T.D. (ft. bgs)	Screen (ft. bgs)	Bentonite Seal (ft. bgs)	Grout Seal (ft. bgs)
MW-2	**5/22/89**	**12**	**15.5**	**NA***	**25**	**20.0-9.0**	**9.0-7.0**	**7.0-0**
MW-3	**5/23/89**	**12**	**15.3**	**NA**	**21**	**19.0-9.5**	**9.5-8.0**	**8.0-0**
MW-4	**5/23/89**	**12**	**13.0**	**NA**	**20**	**15.5-9.5**	**9.5-7.5**	**7.5-0**

* NA = Not available until wellheads are surveyed.

3.4 Soil Analysis/Results

Soil samples were properly packaged and transferred to a California State-certified analytical laboratory under proper chain-of-custody and preservation (see Appendix F). The samples were analyzed for TPH (as gasoline and diesel) and BTEX using EPA Methods 3550, 5050, 8015 and 8020, and for Pb using EPA Methods 3050 and 7421. Analytical results are summarized in Table 4 and included as Attachment 2.

TABLE 4: Soil Analytical Results (ppm)

Boring No.	Sample Depth (ft. bgs)	Moisture	TPH-g	TPH-d	Benzene	Toluene	Ethyl-benzene	Xylene	Total Lead
MW-2	**5,10,15**	**Moist**	**<10**	**<10**	**<0.025**	**0.028**	**<0.075**	**<0.075**	**0.4**
MW-2	**10**	**Moist**	**<10**	**<10**	**<0.025**	**<0.025**	**<0.075**	**<0.075**	**1.0**
MW-3	**10**	**Moist**	**28**	**<10**	**0.054**	**0.032**	**<0.075**	**0.099**	**<0.2**
MW-3	**5,10,15**	**Moist**	**<10**	**<10**	**<0.025**	**<0.025**	**<0.075**	**<0.075**	**<0.2**
MW-4	**10**	**Moist**	**<10**	**<10**	**<0.025**	**<0.025**	**<0.075**	**<0.075**	**<0.2**
MW-4	**5,10**	**Moist**	**<10**	**<10**	**<0.025**	**<0.025**	**<0.075**	**<0.075**	**<0.2**

3.5 Groundwater Analysis and Results

Groundwater samples were properly packaged and transferred to a California State-certified analytical laboratory under proper chain-of-custody and preservation (see Appendices E and F). The samples were analyzed for TPH (as gasoline and diesel), and BTEX using EPA Methods 3150, 5030, 8015 and 602. The analytical results are summarized in Table 5, and certified sheets from all analyses are enclosed as Attachment 3.

TABLE 5: Groundwater Analytical Results (ppm)

Well No.	Sample Date	TPH-g	TPH-d	Benzene	Toluene	Ethyl-benzene	Xylene
MW-2	**6/20/89**	**0.8**	**<0.1**	**0.046**	**0.0068**	**0.0027**	**0.056**
MW-3	**6/20/89**	**2.3**	**<0.1**	**0.18**	**0.15**	**0.054**	**0.8**
MW-4	**6/20/89**	**<0.05**	**<0.1**	**<0.0005**	**<0.0005**	**<0.0015**	**<0.0015**

3.6 Physical Monitoring Results

Three wells were physically monitored for depth to water table, and measurement of floating product, if any, once during the quarter. A summary of these results is presented in Table 6.

TABLE 6 Physical Monitoring Results: Evidence of Contamination

Well No.	Date	Depth to Water (ft.)	Petroleum Water Odor	Thickness Floating Product (inches)	Notes
MW-2	**6/19/89**	**11.91**	**None**	**None**	**Soft sed. in bottom**
MW-3	**6/19/89**	**10.99**	**None**	**None**	**Soft sed. in bottom**
MW-4	**6/19/89**	**12.18**	**None**	**None**	**No seds.**

3.7 Hydrologic Tests and Research

Certain public files and records were researched, and conversations were held with authorities on local water conditions to provide background on the location and thickness of saturated zone, soil stratigraphy, groundwater flow patterns, seasonal variation of water tables, beneficial uses, etc. This information is included in the interpretive diagrams presented in Section 4 of this report.

3.9 Neighborhood Assessment

An environmental assessment of neighborhood businesses, ownerships, and prior operations practices was started to identify possible discharge of MVF to the environmental upgradient or near the subject property (See Drawing 1a). Agency records

were reviewed to identify nearby owners of underground storage tanks and hazardous materials handlers and generators.

3.10 Underground Utility Survey

A survey of the underground utilities servicing the existing commercial buildings was conducted to identify potential locations for future monitoring wells (See Drawing 2). The main utility trench is located in the alley between buildings immediately to the west of the former underground storage tanks as shown on the base map. The utility trench runs from 20th Street in a northeasterly direction along the building wall and then makes a right angle direction change and stops at a pad mounted transformer and the gas meters. A 12 kilovolt electric line contained in two 4 inch diameter conduits are located in the trench and are 18 to 24 inch below grade. A natural gas line 24 inch below grade runs from the sidewalk to the meter in the same utility trench. A 4 inch diameter sanitary sewer line is also located in the utility trench. The main waterline for the building is east of the utility trench and runs a short distance from the meters located on the sidewalk to the building wall.

4. REVIEW OF DATA AND INTERPRETATIONS

4.1 Groundwater Elevation and Gradient (See Drawing 4)

- Groundwater gradient is generally west, at 0.008 ft/ft.

4.2 Distribution of MVF Contamination in Soil (See Drawings 5 and 6)

- OVM readings indicated soil contamination in gravel lenses at 10-12 feet bgs.
- Diesel and gasoline contamination are indicated in subequal amounts.
- Only one soil sample contained TPH-g and TPH-d: MW-3 at 10-feet bgs. This sample was from the new well near former well B-8, which once contained floating product (Q2/85).

4.3 Distribution of Dissolved MVF Contamination in Groundwater

- TPH-g contamination was present in groundwater from two of the wells.

4.4 Distribution of Floating Product on Groundwater

- No floating product was present when the wells were developed (6/19/89).

- In prior years, at other downgradient wells, floating product appeared rapidly in May-June, with thicknesses measurable in inches to feet.

4.5 Geologic Cross Section, Showing Groundwater (See Drawing 7)

5. WORK PLAN MODIFICATIONS

The following tasks were added to or modified from the project Work Plan during Q2/89.

Tasks 1 and 16 (Modified): Soil and groundwater samples were prepared and analyzed by EPA methods listed in Table 7, and not EPA Method 8015 (Modified).

6. STATUS OF SCHEDULE

Task time lines established on the Critical Path were not met because an utilities trench exists along the axis of the driveway on the southern downgradient edge of the property. This driveway is confined by a building and a property boundary fence. The driveway is too narrow to allow for drilling without endangering the utility lines. Shell is proceeding with a request to gain access to the fence area so wells can be drilled onsite between the fence and the utilities trench.

7. WORK PLANNED FOR NEXT QUARTER

Tasks 1, 15, 16 and 17 (see Critical Path) will be continued next quarter following the protocols and task descriptions of the project Work Plan dated April 5, 1989.

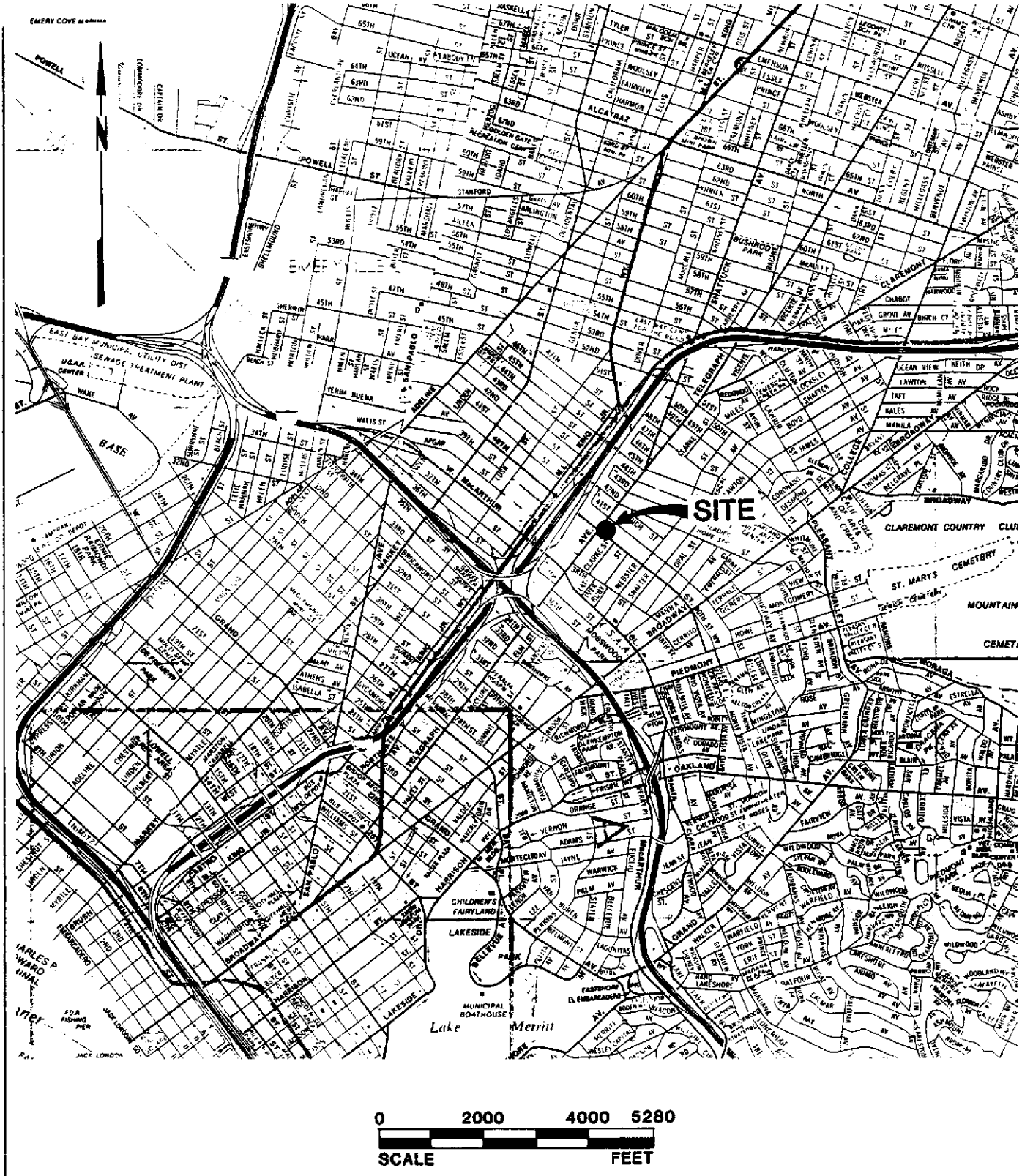
Three wells will be installed in the driveway, at locations shown on Drawing 8. These wells will be near prior wells B-3 and B-4, which contained measurable product during certain seasons. Analytical methods will follow the listings on Table 7. All soil samples collected on five foot centers downhole (in the unsaturated zone) will be analyzed as depth-discrete sampling.

In addition, groundwater monitoring will be conducted as field measurements quarterly on six wells, and as groundwater sampling for TPH-g, TPH-d and BTEX analysis on six wells.

TABLE 7
REVISED 6 OCTOBER 1988

RECOMMENDED MINIMUM VERIFICATION ANALYSES FOR UNDERGROUND TANK LEAKS

HYDROCARBON LEAK	SOIL ANALYSIS			WATER ANALYSIS		
		Prep	Analysis		Prep	Analysis
Unknown Fuel	TPH G	5030	8015	TPH G	5030	8015
	TPH D	3550	8015	TPH D	3510	8015
	BTX&E	5030	8020/8240	BTX&E	5030	602/624
	LEAD	3050	7421	LEAD	3050	7421
Leaded Gas	TPH G	5030	8015	TPH G	5030	8015
	BTX&E	5030	8020/8240	BTX&E	5030	602/624
	LEAD	3050	7421	LEAD	3050	7421
Unleaded Gas	TPH G	5030	8015	TPH G	5030	8015
	BTX&E	5030	8020/8240	BTX&E	5030	602/624
Diesel	TPH D	3550	8015	TPH D	3510	8015
	BTX&E	5030	8020/8240	BTX&E	5030	602/624
Waste Oil or Unknown	TPH G	5030	8015	TPH G	5030	8015
	TPH D	3550	8015	TPH D	3510	8015
	O & G	503D	503E	O & G	503A	503E
	BTX&E	5030	8020/8240	BTX&E	5030	8020/8240
	CL HC	5030	8010/8240	CL HC	5030	601/624
	ICAP or AA to detect metals: Cd, Cr, Pb, Zn					



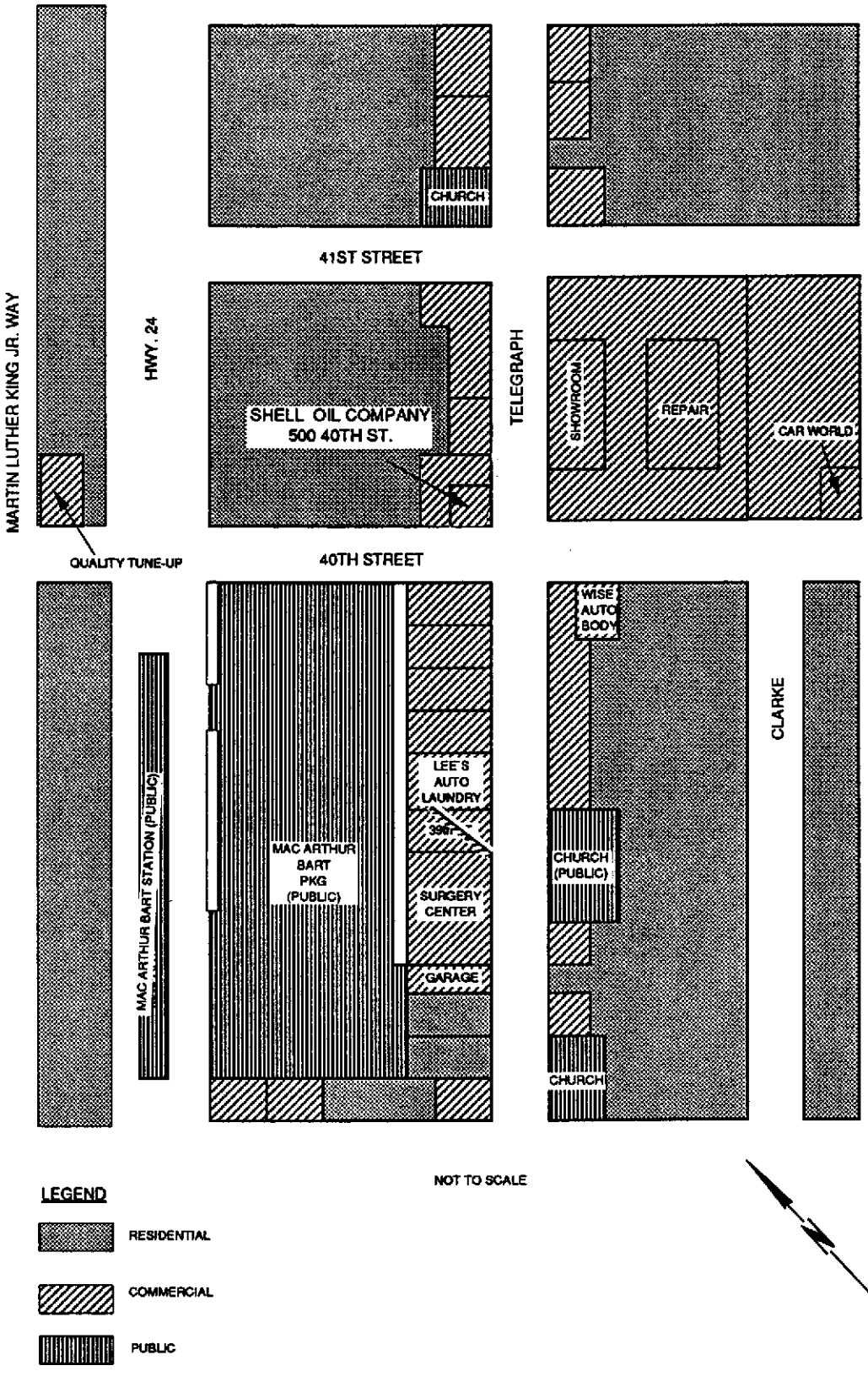
SOURCE: California State Automobile Association.

SITE LOCATION MAP

SHELL OIL COMPANY
500 40th Street
Oakland, California

Scale: AS SHOWN	Project No.: 88-44-361-01
Prepared by: KGC	Date: 4/4/89
Checked by: RMB/MIY	Drawing No.: 1
Approved by:	

Converse Environmental
Consultants California

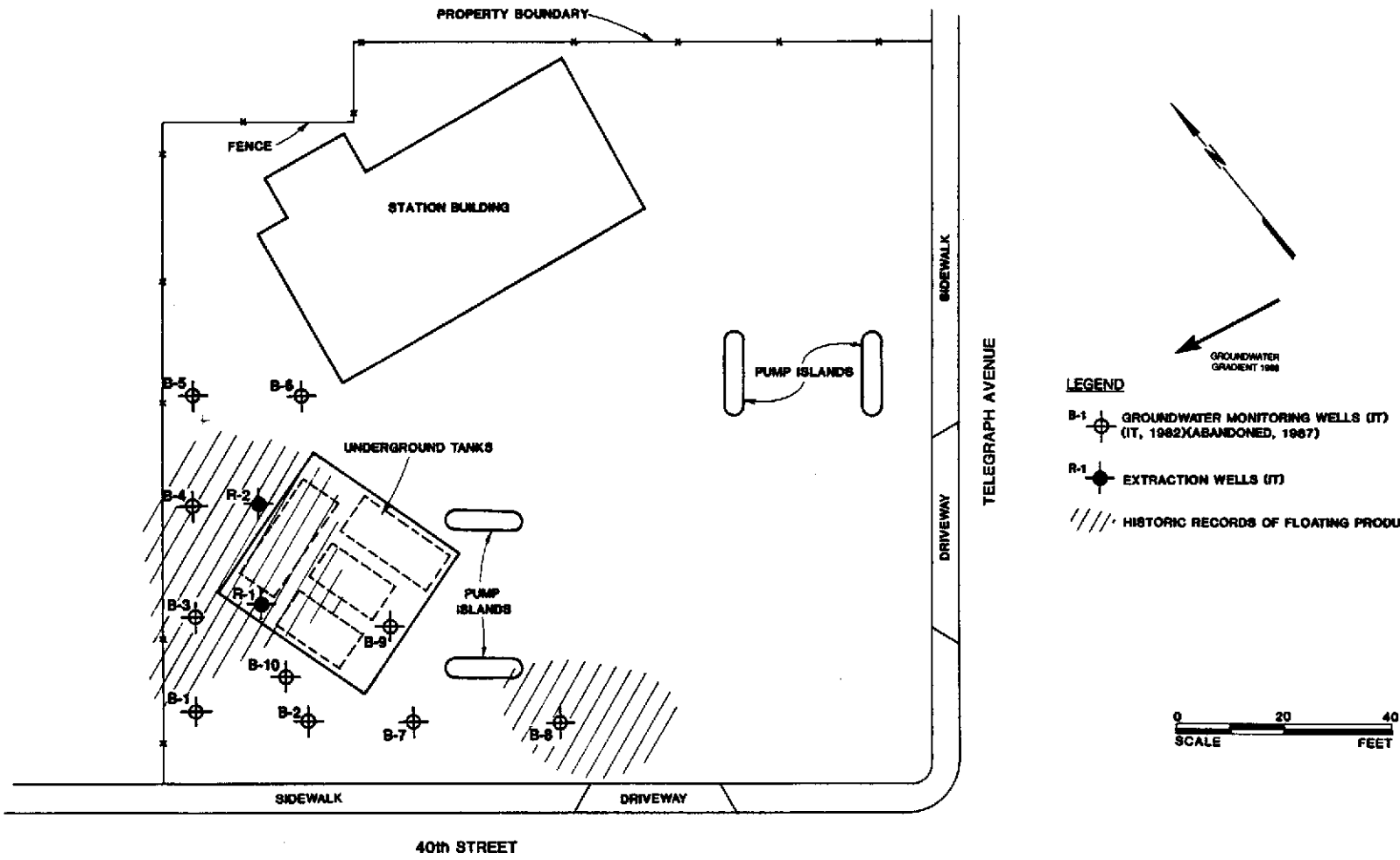


AREA LAND USE

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental Consultants California

Scale: AS SHOWN	Project No.: 88-44-361-01
Prepared by: CMM	Date: 6/22/89
Checked by: RMB	Drawing No.: 1a
Approved by:	



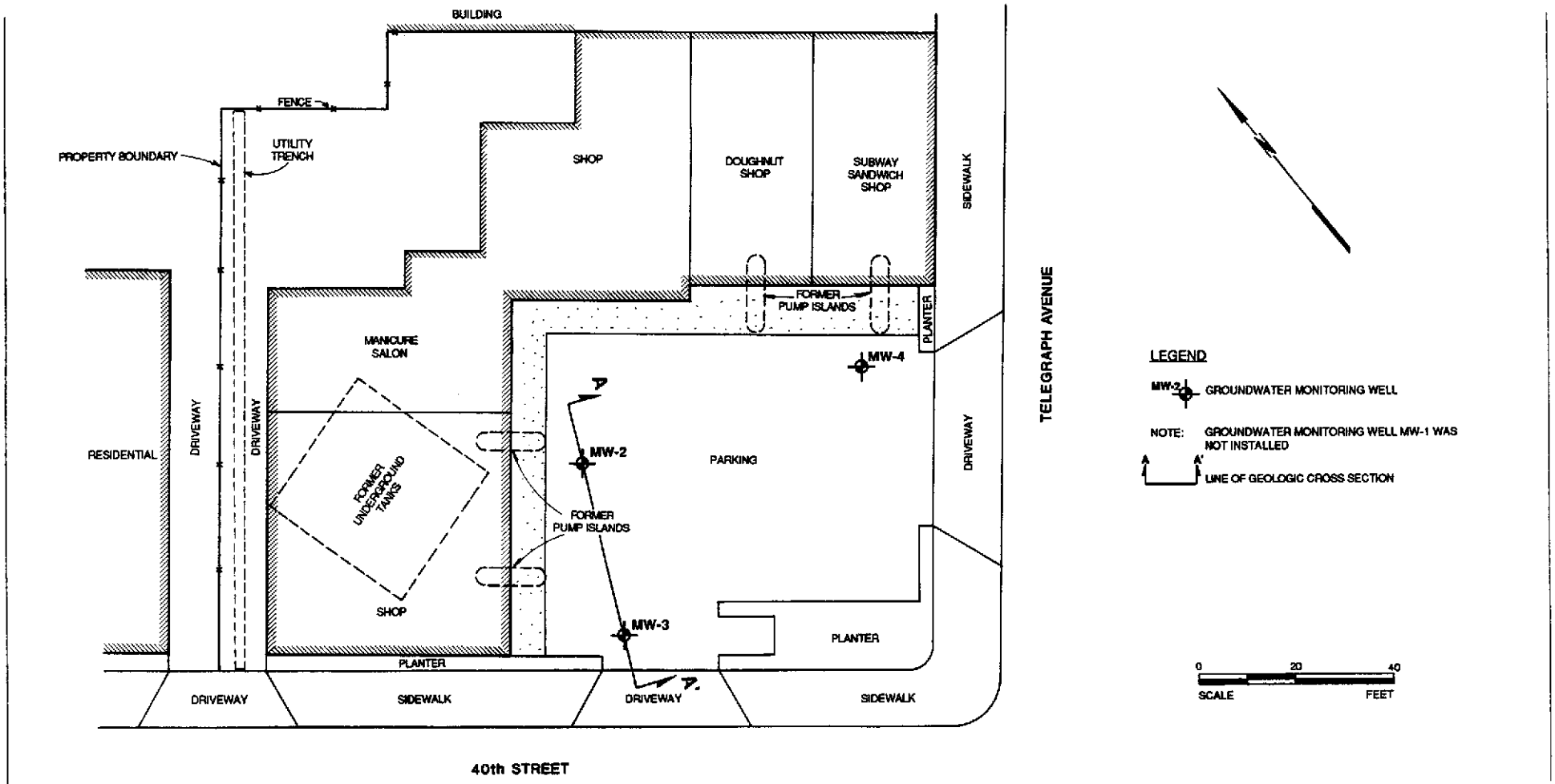
1986-1987 PLOT PLAN - BEFORE CONSTRUCTION OF SHOPPING CENTER

SHELL OIL COMPANY
500 40th Street
Oakland, California

Scale	AS SHOWN
Date	6/14/89
Prepared By	KGC
Checked By	RMB
Approved By	DWC
Project No.	88-44-361-01
Drawing No.	2

Converse Environmental Consultants California

Base Map: after Pacific Environmental Group, Inc. and IT Corporation



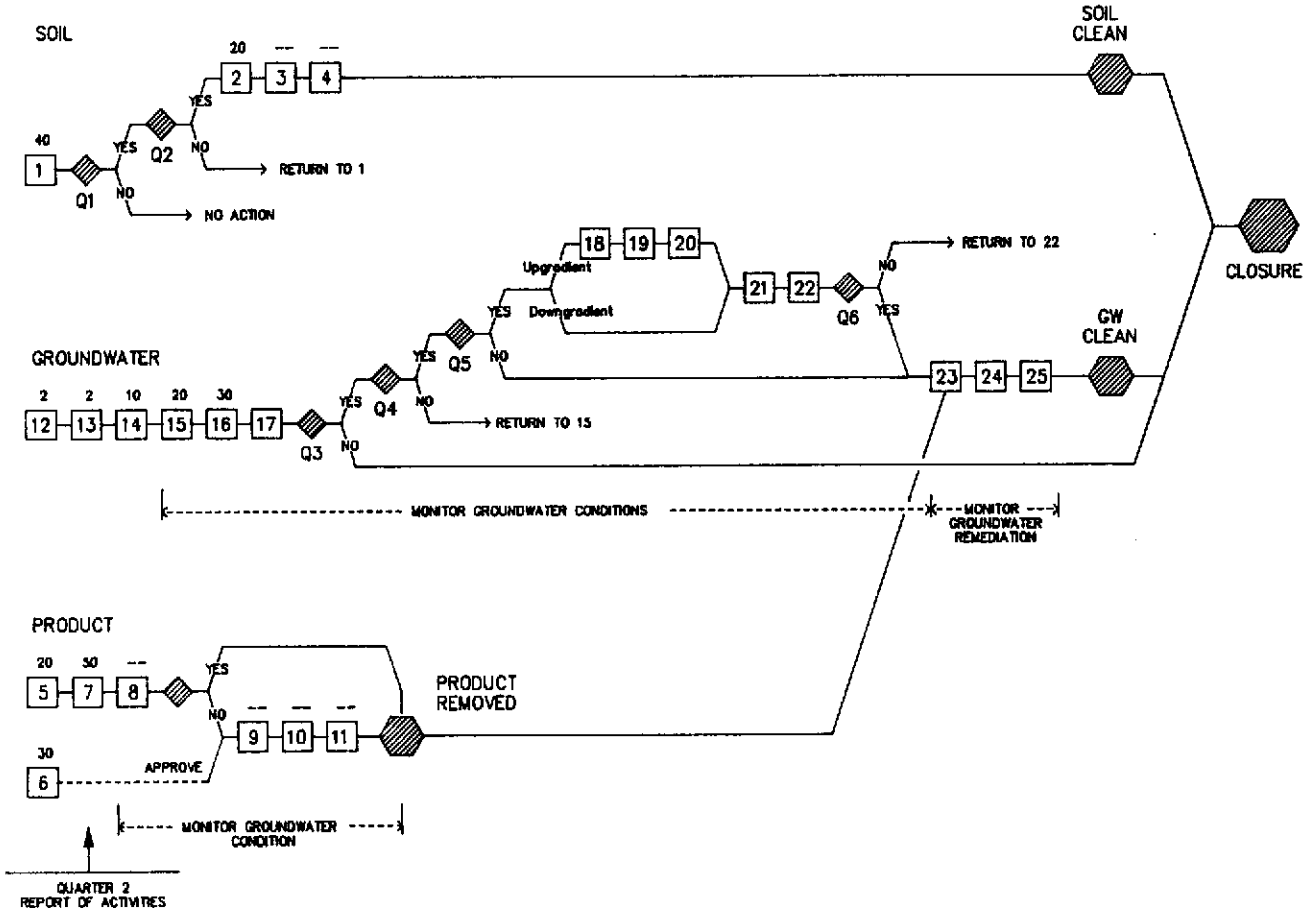
Base Map: Surveyed with EDM, Converse 1989.

1989 PLOT PLAN

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	7/6/89
Prepared By	KGC
Checked By	RMB
Approved By	DWC
Project No.	88-44-361-01
Drawing No.	2a



TASKS

Program I: Onsite Groundwater Investigations

Task 1 Drill Soil Borings/Analyze Soil
Task 2 Prepare Soil Remedial Action Plan
Task 3 Remediate soil (if needed)
Task 4 Confirm Remediated Soil

Program II: Interim Product Remediation

Task 5 Prepare Product Remediation Plan
Task 6 Apply for NPDES (See Task 11)
Task 7 Install Extraction Trench
Task 8 Operate Product Extraction Trench
Task 9 Install Interim Groundwater Treatment System
Task 10 Operate Groundwater Interim Pilot
Task 11 Conduct Groundwater Product Remediation

Program III: Onsite Groundwater Investigations

Task 12 Locate and Expose 1982 Wells
Task 13 Assess Well Conditions
Task 14 Restore/Redevelop Wells
Task 15 Install New Wells
Task 16 Sample/Analyze Groundwater
Task 17 Conduct Hydro Tests/Research

Program IV: Offsite Soil Investigations and Remediation

Task 18 Neighborhood Assessment
Task 19 Refer to Legal Counsel
Task 20 Inform RWQCB
Task 21 Offsite Groundwater Investigation Plan
Task 22 Install Offsite Wells; Sample/Analyze

Program V: Groundwater Remediation

Task 23 Prepare Groundwater Remediation Action Plan
Task 24 Implement Remedial Action Plan
Task 25 Confirm Remediated Groundwater

QUESTIONS

Q1: Is soil actionable?
Q2: Is soil fully characterized?
Q3: Is groundwater actionable?
Q4: Is groundwater characterized onsite?
Q5: Does groundwater pollution extend offsite?
Q6: Is groundwater characterized offsite?
Q7: Is the product fully recovered to the extent possible?

CRITICAL PATH DIAGRAM

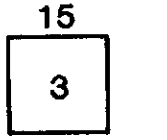
SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental Consultants California

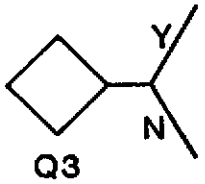
Scale	N/A
Date	4-5-89
Prepared By	LQL
Checked By	RMB
Approved By	DWC
Project No.	88-44-361-01
Drawing No.	3

KEY TO CRITICAL PATH DIAGRAMS

Time proceeds from left to right, with Tasks shown in relative order of succession.

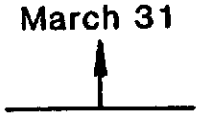


Task, showing Task number (inside) and anticipated number of days to completion (above), including preparatory activities, report preparation and review, and other related actions.



Question to be answered based on information from prior tasks.

Solid symbols indicate Letter Reports or formal Completion Reports coincident with question response.



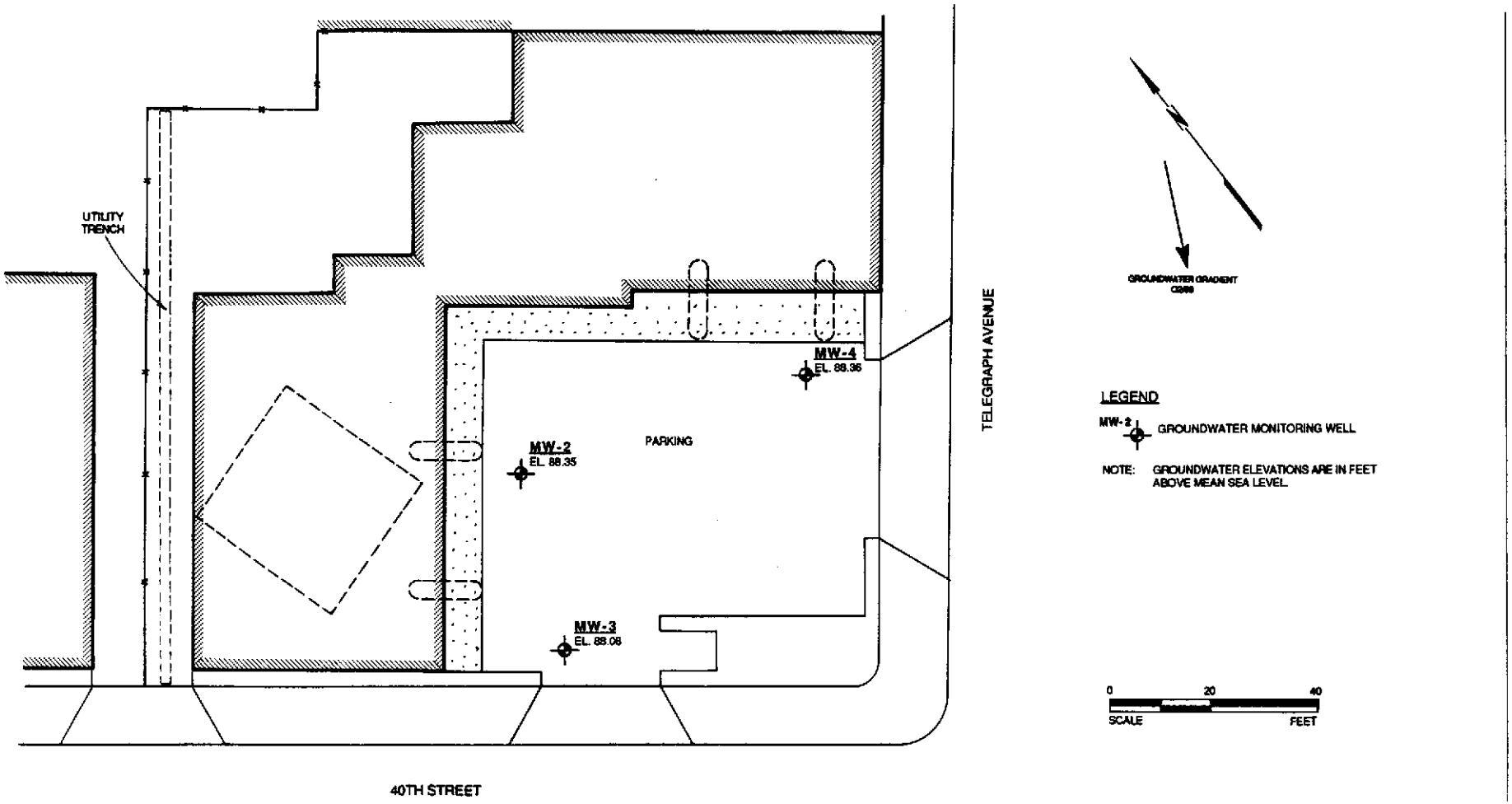
Relative calendar dates and dates of quarterly program reports to regulatory agencies.

KEY TO CRITICAL PATH DIAGRAM

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental Consultants California

Scale: N/A
Date: 4/4/89
Prepared By: LQL
Checked By: RMB/MIY
Approved By: DWC
Project No: 88-44-361-01
Drawing No: 3a



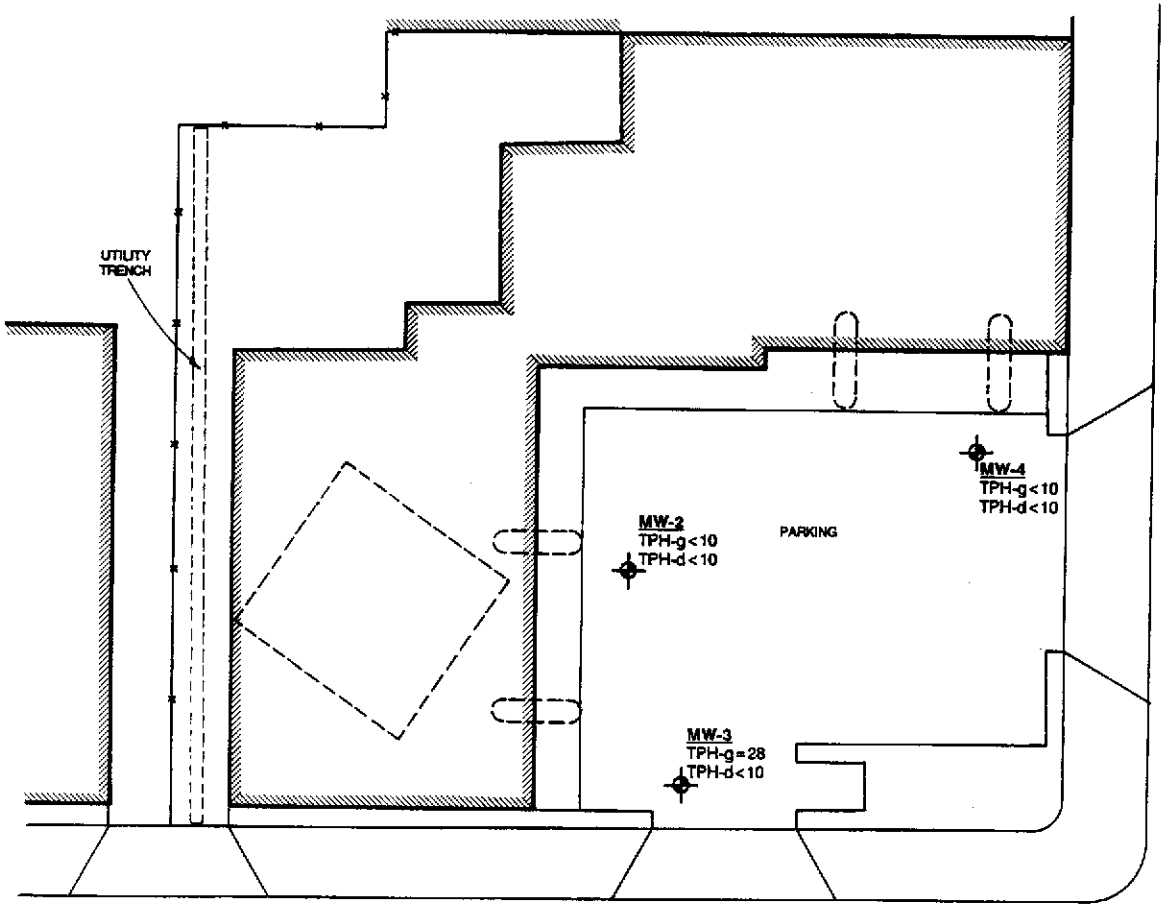
GROUNDWATER GRADIENT

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	7/5/89
Prepared By	CRB/KGC
Checked By	RMB
Approved By	DWC
Project No	88-44-361-01
Drawing No.	4

Base Map : Surveyed with EDM, Converse 1989.



GROUNDWATER GRADIENT

LEGEND

TPH-g = GASOLINE(ppm)

TPH-d = DIESEL(ppm)

MW-2 GROUNDWATER MONITORING WELL

NOTE: GROUNDWATER MONITORING WELL MW-1 WAS NOT INSTALLED.

0 20 40

SCALE FEET

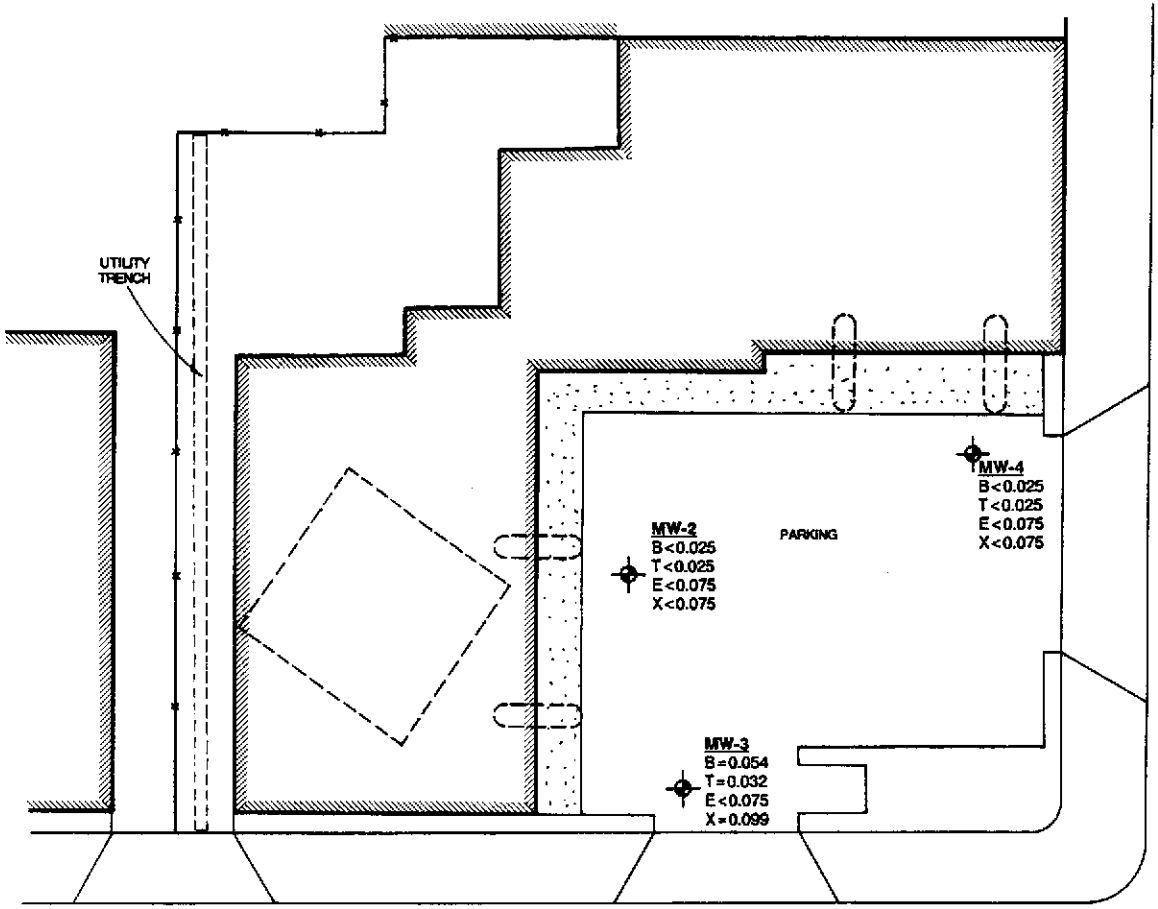
Base Map : Surveyed with EDM, Converse 1989.

PLAN: SOIL TPHg AND TPHd AT (-10') Q2/89

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	7/6/89
Prepared By	CRB/KGC
Checked By	RMB
Approved By	DWC
Project No.	88-44-361-01
Drawing No.	5



LEGEND

B = BENZENE (ppm)

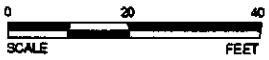
T = TOLUENE (ppm)

E = ETHYLBENZENE (ppm)

X = XYLENE (ppm)

MW-2 GROUNDWATER MONITORING WELL

NOTE: GROUNDWATER MONITORING WELL MW-1 WAS NOT INSTALLED



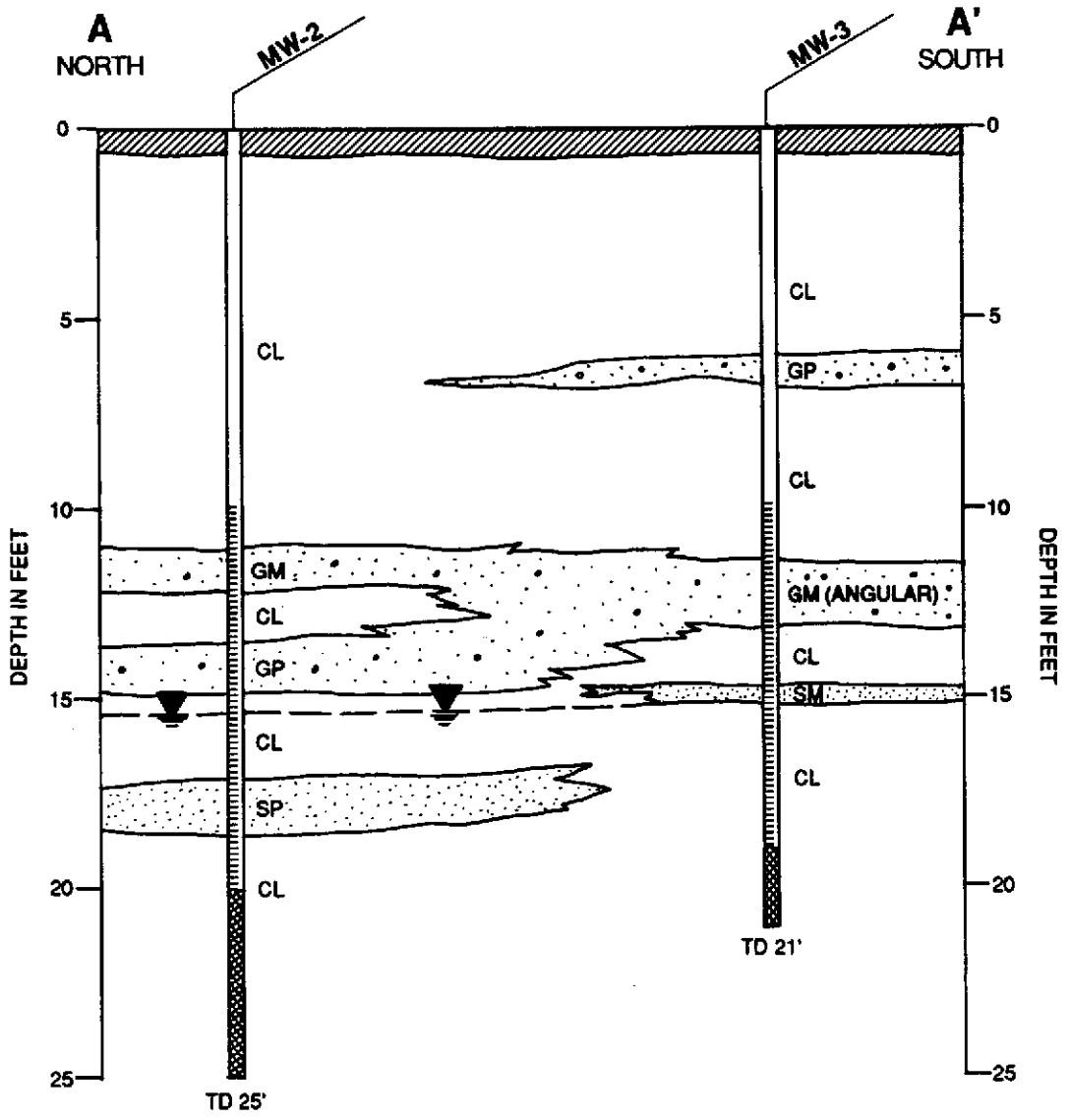
PLAN: SOIL BTEX AT (-10') Q2/89

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	7/6/89
Prepared By	CRB/KGC
Checked By	RMB
Approved By	DWC
Project No.	88-44-361-01
Drawing No.	6

Base Map: Surveyed with EDM, Converse 1989.



LEGEND

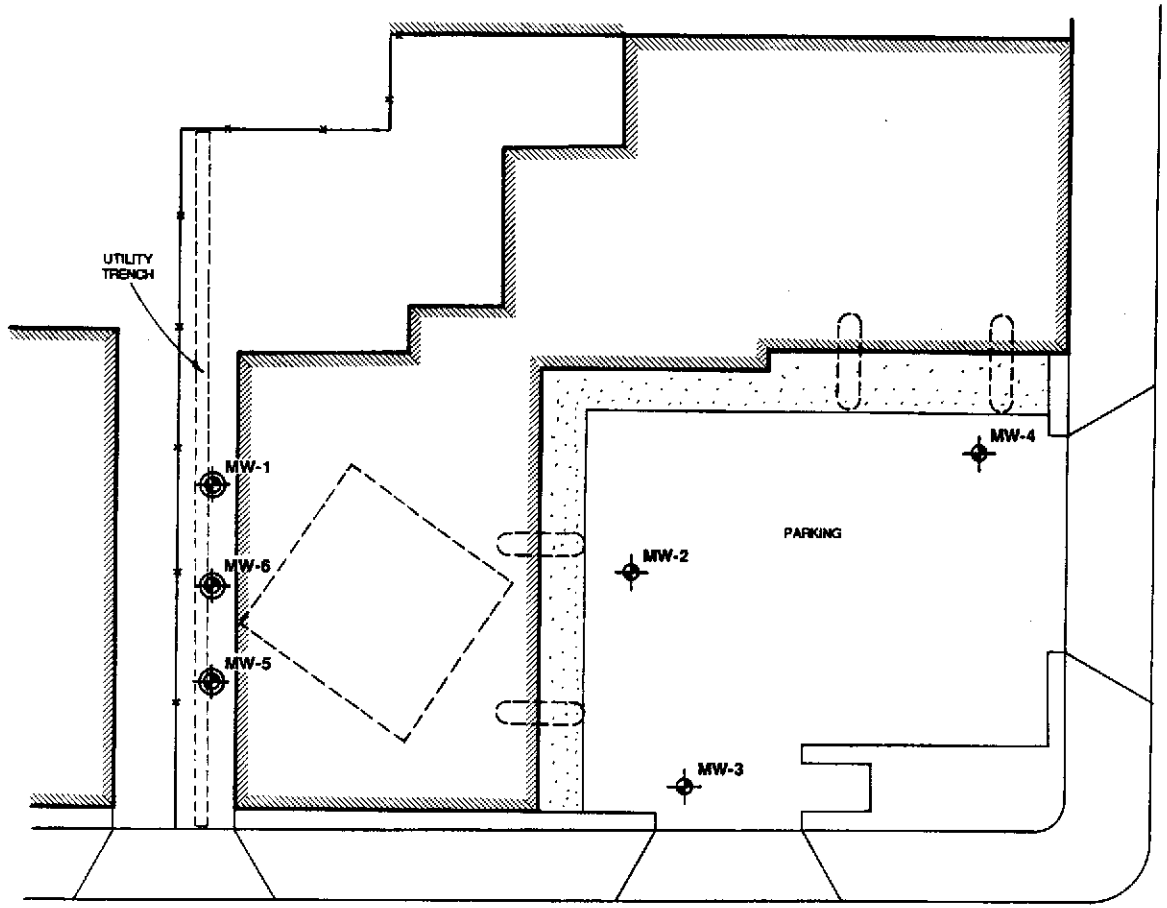
	FILL
ML	SILT
SM, SP, GM, GP	SANDS AND GRAVELS
CL	CLAY OR SILTY CLAY
	SCREEN
	BENTONITE PLUG

CROSS SECTION A-A'

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Project No.	88-44-361-01
Prepared by	CRB
Date	6/22/89
Checked by	RMB
Drawing No.	7
Approved by	DWC



LEGEND

MW-5 PROPOSED GROUNDWATER MONITORING WELL

MW-2 GROUNDWATER MONITORING WELL

Base Map: Surveyed with EDM, Converse 1989.

PROPOSED GROUNDWATER MONITORING WELLS

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	7/6/89
Prepared By	CRB/KGC
Checked By	RMB
Approved By	DWC
Project No.	88-44-361-01
Drawing No.	8

LOG OF BORING NO. MW-2

DATE DRILLED: 5/22/89	ELEVATION:	WL TAKEN: 05-22-89	EQUIPMENT: 8"x 3-3/4" & 12"x 8"

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	PLASTICITY	COLOR	DESCRIPTION	WELL CONSTRUCTION	BLOWS/FT.	T.P.H Mg/Kg	TESTS
				moist	loose	brown	SANDY GRAVEL (Fill) SP-GP				
					soft	black	GRAVELLY CLAY CL Glass and brick fragments and asphalt fragments				
	D			moist	stiff		SILTY CLAY CL		11		
5									33		
				moist	stiff	tan mottled gray rust	Trace gravels				
						brown			48		
	D					black	SILTY CLAY CL Some fine sand		15		
10									73		
					dense	gray	SANDY GRAVEL GM Trace silt				
					stiff	mottled tan rust	SILTY CLAY CL		36		
					medium dense		Fine SANDY GRAVEL (angular) GP				
	D								13		
15		▽			medium dense	gray mottled rust	SILTY CLAY CL Lenses sand		31		
				wet	loose	tan	GRAVELLY SAND SP		23		
				very moist	loose	gray	SILTY CLAY CL		10		
20											

REGISTERED PROFESSIONAL ENGINEER Douglas W. Grant No. 4110 STATE OF CALIFORNIA

SHELL OIL COMPANY
500 40th treet
Oakland, California

Project No.
88-44-361-01

Converse Environmental Consultants California

Drawing No.
A-1

LOG OF BORING NO.MW-2

continued - page 2

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	PLASTICITY	COLOR	DESCRIPTION	WELL CONSTRUCTION	BLOWS/FT.	T.P.H Mg/Kg	TESTS
				very moist	medium	tan mottled rust	SILTY CLAY and fine SAND CL		14		
									53		
						brown	SILTY CLAY Lenses sand		30		
25							Bottom of Hole at 25 ft.				
30											
35											
40											

REGISTERED PROFESSIONAL GEOLOGIST
Douglas W. Charlton
No. 4110
STATE OF CALIFORNIA

SHELL OIL COMPANY
500 40th treet
Oakland, California

Project No.
88-44-361-01

Converse Environmental Consultants California

Drawing No.
A-2

LOG OF BORING NO. MW-3

DATE DRILLED: 5/23/89	ELEVATION:	WL TAKEN: 5/23/89	EQUIPMENT: 8"x 3-3/4" & 12"x 8"

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	PLASTICITY	COLOR	DESCRIPTION		WELL CONSTRUCTION	BLOWS/FT.	T.P.H Mg/Kg	TESTS
				moist	loose	brown	SANDY GRAVEL (Fill)	GP				
				moist	stiff	black mottled tan	SILTY CLAY	CL				
5	D									13		
						tan mottled rust						
					medium dense		GRAVEL LENS	GP		38		
					stiff		SILTY CLAY Trace gravel	CL				
	D									32		
						gray mottled tan						
10	2									12		
										49		
					medium dense	tan	Fine SAND with angular GRAVEL some silt	GM				
					stiff	tan mottled gray	SILTY CLAY Trace gravel	CL		40		
	D			very moist			Some fine sand			13		
15				wet		tan mottled rust	LENS SANDY CLAY	GC				
				very moist			SILTY CLAY	CL		28		
										27		
					very stiff					17		
20				moist	very stiff	tan	SILTY CLAY Bottom of Hole at 21 ft.	CL		45		

REGISTERED PROFESSIONAL ENGINEER
Douglas W. Charlton
No. 4110
STATE OF CALIFORNIA
CIVIL

SHELL OIL COMPANY
500 40th Street
Oakland, California

Project No.
88-44-361-01

Converse Environmental Consultants California

Drawing No.
A-3

LOG OF BORING NO. MW-4

DATE DRILLED: 5/23/89	ELEVATION:	WL TAKEN: 5/23/89	EQUIPMENT: 8"x 3-3/4" & 12"x 8"

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	PLASTICITY	COLOR	DESCRIPTION		WELL CONSTRUCTION	BLOWS/FT.	T.P.H Mg/Kg	TESTS
				moist	loose medium	brown	GRAVELLY SAND (Fill)	GP-SP				
						black	SILTY CLAY and GRAVELS Decreasing gravel	CL				
5	D					tan mottled rust	SILTY CLAY Trace gravel			10 38		
	D				stiff	brown mottled rust				45		
	2									19		
10					medium dense		SANDY GRAVEL Trace silt.	GM		39		
						tan	LENS CLAY	CL				
						gray	LENS GRAVEL	GM				
					medium	tan	SILTY CLAY and fine SAND	CL		19		
		▼		wet								
	D				medium dense		SANDY GRAVEL and SILT	GM		24		
15				very moist	stiff		SILTY CLAY some GRAVEL	CL		36		
					medium							
				very moist		tan mottled rust				17		
							Increasing SAND					
20							Bottom of Hole: 20 ft.					

REGISTERED PROFESSIONAL ENGINEER
Douglas W. Charlton
No. 4110
STATE OF CALIFORNIA

SHELL OIL COMPANY
500 40th Street
Oakland, California

Project No.
88-44-361-01

Converse Environmental Consultants California

Drawing No.
A-4

NET NATIONAL ENVIRONMENTAL TESTING, INC.

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

Formerly: ANATEC Labs, Inc.

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

06-09-89
NET Pacific Log No: 6607
Series No: 212
Client Ref: Project# 88-44-361-01

Subject: Analytical Results for Shell - 40th St., Oakland Received 05-26-89.

Dear Robin Breuer/Fadwa Samara

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Brian Fies
Group Leader
Atomic Spectroscopy

Approved by:

Susan Joy Griffin
Group Leader
Gas Chromatography

/sm
Enc: Sample Custody Document

KEY TO ABBREVIATIONS

mean	:	Average; the sum of the measurements divided by the total number of measurments.
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, unless noted otherwise.
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.
ND	:	Not detected; the analyte concentration is less than the listed reporting limit.
NR	:	Not requested.
NTU	:	Nephelometric turbidity units.
RL	:	Reporting limit.
RPD	:	Relative percent difference, $[V^1-V^2/V$ mean$]x100$.
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.
ug/filter	:	Concentration in units of micrograms of analyte per filter.
umhos/cm	:	Micromhos per centimeter.
*	:	See cover letter for details.

THE COVER LETTER AND KEY TO ABBREVIATIONS ARE AN INTEGRAL PART OF THIS REPORT

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results (ppm) MW-3-2 @ 10' (-28276)	MW-4-2 @ 10' (-28277)	MW-3-1,2,3 Composite 05-23-89 (-28278)	MW-4-1,2 Composite 05-23-89 (-28279)	Method No:
Lead	0.2	ND	ND	ND	ND	7421
PETROLEUM HYDROCARBONS						
Volatile, as Gasoline	10	28	ND	ND	ND	GCFID/5030
DATE ANALYZED		06-06-89	06-06-89	06-06-89	06-06-89	
Extractable,						
as Motor Oil	10	ND	ND	ND	ND	GCFID/3550
as Diesel Fuel	10	ND	ND	ND	ND	GCFID/3550
DATE ANALYZED		06-02-89	06-02-89	06-02-89	06-02-89	
DATE EXTRACTED		06-02-89	06-02-89	06-02-89	06-02-89	

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results (ppm) MW-3-2 @ 10' (-28276)	MW-4-2 @ 10' (-28277)	MW-3-1,2,3 Composite 05-23-89 (-28278)	MW-4-1,2 Composite 05-23-89 (-28279)	Method No:
PURGEABLE AROMATICS						
Benzene	0.025	0.054	ND	ND	ND	8020
Ethylbenzene	0.075	ND	ND	ND	ND	8020
Toluene	0.025	0.032	ND	ND	ND	8020
Xylenes, total	0.075	0.099	ND	ND	ND	8020

Converse Consultants

CHAIN OF CUSTODY RECORD 6/6 +B 1 HE 6/8 4 samples (10607)

Project No.	Project Name
88-44-361-01	500 40th St Oak

Samplers: (signature) D. Coy

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	Lead 7421	TPH-G 8015	TPH-D 8015			Remarks
MW3	5/23/89				MW-3-1 @ 5'	1						Std Turn Around
MW3	5/23				MW-3-2 @ 10'	duplicate	X	X	X		Comp	
MW3	5/23				MW-3-3 @ 15'	1						
MW4	5/23				MW-4-1 @ 5'	1						
MW4	5/23				MW-4-2 @ 10'	1	X	X	X		Comp	
												per bob 5/30

Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
D. Coy	5/25 1350	Diane Krueger	Diane Krueger	5-26 7:50	GARY-A
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
Method of Shipment		Shipped by: (signature)	Courier from Airport: (signature) VIA AES	Received for Laboratory: (signature)	Date/Time 5/26/89 2130

NET NATIONAL ENVIRONMENTAL TESTING, INC.

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

Formerly: ANATEC Labs, Inc.

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

06-12-89
NET Pacific Log No: 6604
Series No: 212
Client Ref: Project# 88-44-361-01

Subject: Analytical Results for Shell - 500 40th St., Oakland Received 05-26-89.

Dear Ms. Breuer:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Brian Fies
Group Leader
Atomic Spectroscopy

Approved by:

Susan Joy Griffin
Group Leader
Gas Chromatography

/sm
Enc: Sample Custody Document

KEY TO ABBREVIATIONS

mean	:	Average; the sum of the measurements divided by the total number of measurments.
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, unless noted otherwise.
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.
ND	:	Not detected; the analyte concentration is less than the listed reporting limit.
NR	:	Not requested.
NTU	:	Nephelometric turbidity units.
RL	:	Reporting limit.
RPD	:	Relative percent difference, $[V^1-V^2/V \text{ mean}]x100$.
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.
ug/filter	:	Concentration in units of micrograms of analyte per filter.
umhos/cm	:	Micromhos per centimeter.
*	:	See cover letter for details.

THE COVER LETTER AND KEY TO ABBREVIATIONS ARE AN INTEGRAL PART OF THIS REPORT

SAMPLE DESCRIPTION: MW-2 1,2,3 Comp 05-22-89
LAB NO.: (-28261)

Parameter	Reporting Limit	Results	Units	Methods
Lead	0.2	0.4	ppm	7421
PETROLEUM HYDROCARBONS				
Volatile, as Gasoline	10	ND	ppm	8015/5030
DATE ANALYZED		06-2-89		
Extractable,				GCFID/3550
as Motor Oil	10	ND	ppm	
as Diesel Fuel	10	ND	ppm	
DATE ANALYZED		06-2-89		
DATE EXTRACTED		06-2-89		
PURGEABLE AROMATICS				8020
Benzene	0.025	ND	ppm	
Ethylbenzene	0.075	ND	ppm	
Toluene	0.025	0.028	ppm	
Xylenes, total	0.075	ND	ppm	

SAMPLE DESCRIPTION: MW-2-2 @ 10' 05-22-89
LAB NO.: (-28262)

Parameter	Reporting Limit	Results	Units	Methods
Lead	0.2	1.0	ppm	7421
PETROLEUM HYDROCARBONS				
Volatile, as Gasoline	10	ND	ppm	8015/5030
DATE ANALYZED		06-2-89		
Extractable,				GCFID/3550
as Motor Oil	10	18	ppm	
as Diesel Fuel	10	ND	ppm	
DATE ANALYZED		06-2-89		
DATE EXTRACTED		06-2-89		
PURGEABLE AROMATICS				8020
Benzene	0.025	ND	ppm	
Ethylbenzene	0.075	ND	ppm	
Toluene	0.025	ND	ppm	
Xylenes, total	0.075	ND	ppm	

2 samples

Converse Consultants

CHAIN OF CUSTODY RECORD

6/16 Kyle 6/18 6/16

6604

Project No.	Project Name
88-44-361-01	500 40th St Oak

Samplers: (signature) D. Coy

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	Lead 7421	TPH-G 8015	TPH-D 8015			Remarks
MW-2	5/22/89				MW-2-1 @ 5'							5T. Turn Around
MW-2	5/22				MW-2-2 @ 10'	duplicate	X	X	X		Composite	
MW-2	5/22				MW-2-3 @ 15'							

per Bob 5/30 JK

Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
D. Coy	5/25/1350	Diane Kruger	Diane Kruger	5-26 | 7:30	GARY A
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
	|			|	
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
	|			|	
Method of Shipment		Shipped by: (signature)	Courier from Airport: (signature) (via NCS)	Received for Laboratory: (signature) K Temple	Date/Time 5/26/89 | 2136

NET NATIONAL ENVIRONMENTAL TESTING, INC.

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

Formerly: ANATEC Labs, Inc.

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

06-26-89
NET Pacific Log No: 6861
Series No: 212
Client Ref: Project# 88-44-361-01

Subject: Analytical Results for Shell - 500 40th St., Oakland Received 06-21-89.

Dear Mr. Charlton:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Brian Fies
Group Leader
Atomic Spectroscopy

Approved by:

Susan Joy Griffin
Group Leader
Gas Chromatography

/sm
Enc: Sample Custody Document

KEY TO ABBREVIATIONS

mean	:	Average; the sum of the measurements divided by the total 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, unless noted otherwise.
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.
ND	:	Not detected; the analyte concentration is less than the listed reporting limit.
NR	:	Not requested.
NTU	:	Nephelometric turbidity units.
RL	:	Reporting limit.
RPD	:	Relative percent difference, $[V^1-V^2/V \text{ mean}]x100$.
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.
ug/filter	:	Concentration in units of micrograms of analyte per filter.
umhos/cm	:	Micromhos per centimeter.
*	:	See cover letter for details.

THE COVER LETTER AND KEY TO ABBREVIATIONS ARE AN INTEGRAL PART OF THIS REPORT

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results (ppm) MW-2 06-20-89 1152 (-29730)	MW-4 06-20-89 1224 (-29731)
PETROLEUM HYDROCARBONS			
Volatile, as Gasoline	0.05	0.80	ND
DATE ANALYZED		06-22-89	06-22-89
METHOD 8015/5030			
Extractable,			
as Motor Oil	0.05	ND	ND
as Diesel Fuel	0.05	ND	ND
DATE ANALYZED		06-21-89	06-21-89
DATE EXTRACTED		06-21-89	06-21-89
METHOD GCFID/3510			

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results (ppm) MW-2 06-20-89 1152 (-29730)	MW-4 06-20-89 1224 (-29731)
PURGEABLE AROMATICS			
Benzene	0.0005	0.046	ND
Ethylbenzene	0.0015	0.0027	ND
Toluene	0.0005	0.0068	ND
Xylenes, total	0.0015	0.0056	ND
METHOD 602			

PM- Doug Charlton

Converse Consultants

CHAIN OF CUSTODY RECORD

Project No.	Project Name
88-44-3161-01	SHELL 500 40th OAKLAND

Samplers: (signature) Thomas Smith

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers (6 - litres, 8 - VOAS)	TPH-GAS	TPH-D	BTEX				Remarks
MW2	6/20/89	11:52		✓	500 40th - OAKLAND	7	✓	✓	✓				48 hrs T.A.T.
MW4	6/20/89	12:24		✓	" " "	7	✓	✓	✓				

SHELL

6861

Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Thomas Smith	6/20/89 1600	Diane Kruger	D Kruger	6-21 0730	JJ
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
Method of Shipment		Shipped by: (signature)	Courier from Airport: (signature) CVIA NCS	Received for Laboratory: (signature) K Temple	Date/Time 6/21/89 0700

NET NATIONAL ENVIRONMENTAL TESTING, INC.

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

Formerly: ANATEC Labs, Inc.

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

06-26-89
NET Pacific Log No: 6860
Series No: 212
Client Ref: Project# 88-44-361-01

Subject: Analytical Results for "Shell - 500 4th St Oakland Received 06-21-89

Dear Mr. Charlton:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Sue J. Long
Group Leader
Classical Chemistry

Approved by:

Susan Joy Griffin
Group Leader
Gas Chromatography

/ml
Enc: Sample Custody Document

pls original
pls c to folder in conference Rm

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

June 26, 1989

Formerly: ANATEC Labs, Inc.

KEY TO ABBREVIATIONS

mean	:	Average; the sum of the measurements divided by the total 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, unless noted otherwise.
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.
ND	:	Not detected; the analyte concentration is less than the listed reporting limit.
NR	:	Not requested.
NTU	:	Nephelometric turbidity units.
RL	:	Reporting limit.
RPD	:	Relative percent difference, $[V^1-V^2/V \text{ mean}]x100$.
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.
ug/filter	:	Concentration in units of micrograms of analyte per filter.
umhos/cm	:	Micromhos per centimeter.
*	:	See cover letter for details.

THE COVER LETTER AND KEY TO ABBREVIATIONS ARE AN INTEGRAL PART OF THIS REPORT

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-3200
Fax: (707) 526-9623

June 26, 1989

Formerly: ANATEC Labs, Inc.

SAMPLE DESCRIPTION: MW-3 06-20-89 1747
LAB NO.: (-29729)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS			
Volatile, as Gasoline	0.05	2.3	ppm
DATE ANALYZED		06-22-89	
METHOD 8015/5030			
Extractable,			
as Motor Oil	0.05	ND	ppm
as Diesel Fuel	0.05	ND	ppm
DATE ANALYZED		06-21-89	
DATE EXTRACTED		06-21-89	
METHOD GCFID/3510			
PURGEABLE AROMATICS			
Benzene	0.0005	0.18	ppm
Ethylbenzene	0.0015	0.040	ppm
Toluene	0.0005	0.15	ppm
Xylenes, total	0.0015	0.80	ppm
METHOD 602			

Converse Consultants

CHAIN OF CUSTODY RECORD

P.M. Dawn Charlton

Project No.	Project Name
88.44.361.01	Shell - 500 40th St. Oakland

Samplers: (signature) Thomas Smith

Shell

60160

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	TPH-GAS	TPH-D	BTEX				Remarks
						4 VOA 3 Litre							
MW-3	6/20/88	5:47		✓	500 40th St. Oakland	7	✓	✓	✓				~~TAT~~ ~~Standard turn around time~~ 48 hrs T.A.T.

Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Thomas Smith	6/20/88 1600	Duane Krueger	D. Krueger	6-21 0230	SSE
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
Method of Shipment		Shipped by: (signature)	Courier from Airport: (signature) (via NES)	Received for Laboratory: (signature) K Temple	Date/Time 6/21/88 0830

APPENDIX A

Hollow-Stem Auger Drilling and Soil Sampling

HOLLOW-STEM AUGER DRILLING AND SOIL SAMPLING

Borings shall be drilled with a hollow-stem auger and sampled with a modified California-type split-spoon sampler. Soil samples shall be of sufficient volume to perform the analyses which may be required, including replicate analyses. Aside from deionized water or distilled water, no fluids will be used in drilling.

Undisturbed (intact) soil samples shall be recovered from soil borings without introducing liquids into the borings. Soil samples as core or cuttings shall be taken continuously from ground surface to termination depth (TD), or through the aquifer zone of interest for lithologic logging.

Soils from all borings shall be described in detail using the Unified Soil Classification System and shall be logged by a professional geologist, civil engineer, or engineering geologist who is registered or certified by the State of California and who is experienced in the use of the Unified Soil Classification System. A technician trained and experienced in the use of the Unified Soil Classification System who is working under the direct supervision of one of the aforementioned professionals shall be qualified to log borings, provided the aforementioned professional reviews the logs and assumes responsibility for the accuracy and completeness of the logs.

All wet zones above the free water zone shall be noted and accurately logged.

If evidence of contamination is detected by sight, smell, or other field analytical methods, drilling shall be halted until the responsible professional determines if drilling deeper is advisable.

All drilling tools shall be thoroughly decontaminated with trisodium phosphate (TSP) or steam cleaner immediately before starting each boring.

Soil samples shall be taken in decontaminated brass sampling tubes in the split-spoon. The brass sleeves will be cut apart using a clean knife. The ends of the tubes will be covered tightly with teflon wrap, capped with tight-fitting plastic caps, wrapped with plastic electricians' tape, and properly labeled.

APPENDIX B

Standards for Backfilling Borings and Sealing Wells

STANDARDS FOR BACKFILLING BORINGS AND SEALING WELLS

INTRODUCTION

As standard practice, all borings and observation and monitoring wells shall be backfilled or sealed with "relatively impervious" grout to prevent surface contamination or cross-contamination between aquifers. Borings will be sealed from termination depth to the surface and observation and monitoring wells shall be backfilled and sealed above the water table. This practice will reduce liability if it is determined and proven that groundwater contamination occurred along a "vertical pathway" in an improperly sealed or filled boring or well.

In hazardous and potentially hazardous waste sites where deep borings or wells are installed, appropriate geologic information will be reviewed to determine if multiple aquifer system(s) exist(s). If such system(s) exist(s), drilling and sealing techniques will be used to prevent contamination of a lower aquifer by upper, potentially contaminated aquifer(s). Grout seals will be installed according to the following techniques through all thicknesses of impermeable zones which separate aquifer.

Borehole grouting shall consist of backfilling with bentonite pellets, cement/bentonite grout, or a thick bentonite slurry, depending upon the depth of the boring, depth to ground water, and type of drilling equipment used. Details of currently acceptable sealing methods are outlined below.

GENERAL SPECIFICATIONS

- All grouting and well construction and sealing and abandonment of borings shall be consistent with local ordinances.

- Cement/bentonite grout used to seal wells will be of a hard consistency that can resist traffic loads, but not installed to create a "concrete pile" that will obstruct further earthwork. Bentonite slurry, which does not support surface loads, will not be used for sealing wells.

GROUTING/SEALING TECHNIQUES

Dry Holes and Borings Containing Less Than 5 Feet of Water

Option 1: Backfill boring with bentonite pellets or granules in about 2-foot lifts. Add a gallon of water to hole after each lift.

Option 2: Pour in a mixture of cement/bentonite group (9 parts cement, 1 part bentonite powder plus water as needed to make mixture consistency of pancake batter).

Option 3: Pour in a thick mixture of bentonite and water. Soil cuttings can be used to bulk this mixture is soil is not contaminated and chunks are small and well-mixed in slurry.

Borings Containing More Than 5 Feet of Water

Option 1: Pump out water and use criteria for "dry hole."

Option 2: Pump cement/bentonite grout to bottom of hole or use tremie. Do not pour grout through water.

Option 3: Pump or tremie bentonite slurry. This alternative is particularly efficient if you are using rotary wash equipment since all you have to do is thicken the drilling mud and pump it through the drill rod.

Monitoring/Observation Well Sealing (Single Aquifer)

A. Place sand pack around well casing to about 2 feet above slotted interval. Anticipate fluctuation of water level so screened interval covers maximum water elevation.

B. Place 2-foot thick bentonite pellet seal above sand pack. Add a bucket of clean water to swell pellets.

C. Pour cement/bentonite grout or bentonite slurry above pellet seal to ground surface.

APPENDIX C

Groundwater Monitoring Well Construction

GROUNDWATER MONITORING WELL CONSTRUCTION

Groundwater monitoring wells shall be constructed according to the general specifications described in the EPA Technical Enforcement Guidance Document (TEGD, 1986) and shown on the attached well construction diagram.

Groundwater monitoring wells shall be installed through hollow stem augers in borings drilled and sampled per Appendix A. Groundwater monitoring wells shall extend to the base of the upper aquifer, as defined by the first consistent (>5-foot thick) clay layer below the upper aquifer, or at least 15 feet below the top of the upper aquifer, whichever is shallower. The wells shall not extend through the laterally extensive clay layer below the upper aquifer. The wells shall be terminated 1 to 2 feet into such a clay layer.

The groundwater monitoring wells shall be single-cased wells which extend to the bottom of the boring or into a bentonite plug, if one is used at the bottom of the boring as a hydraulic seal. The screens shall be factory-perforated from the bottom of the upper blank casing at least 5 feet above the top of the upper aquifer as defined by boring lithology and/or geophysics. The base of the screen shall be the bottom of the well, or above a 2-5 foot long silt trap in the bottom of the well.

Groundwater monitoring wells shall be constructed as filter-packed wells that will prevent the migration of the surrounding formation into the well. Wells shall have 4-inch diameter factory-perforated casing with slots which match formation grain size as determined by field grain-size distribution analysis. Well casings shall have a threaded bottom cap or plug, and may have a silt trap below the screened zone.

All casing and screen shall be flush threaded, and no adhesive shall be used. PVC casing screen shall be steam-cleaned prior to installation. Filter pack shall be washed, graded sand.

Filter packs shall extend at least 2 feet above the top of the perforated interval. A layer of bentonite pellets 1 to 2 feet thick shall be placed on top of the filter pack. Approximately 2 gallons of water shall be added to hydrate the bentonite pellets. The wells shall then be sealed from the top of the bentonite seal to the surface with neat cement. All sand, bentonite and cement shall be placed using a tremie pipe.

Wellheads shall be installed in flush-mounted watertight structures and provided with a watertight caps. Wellheads shall be provided with locked security devices that protect the wells from the entry of surface water, accidental damage, unauthorized access, and vandalism.

Soil and water sampling equipment and materials used to construct the wells shall not donate, capture, mask, nor alter the chemical composition of the soils and ground water.

All well casings, casing fittings, screens, and all other components that are installed in the well shall be thoroughly decontaminated immediately before starting each well installation.

APPENDIX D

Well Development

WELL DEVELOPMENT

For all newly installed groundwater monitoring wells, the well casing, filter pack and adjacent formation shall be cleared of disturbed sediment and water before representative water samples are collected. A field geologist shall supervise such development work.

Before well development begins, the grout and bentonite seals shall set at least 24 hours and one pre-development water sample will be taken for each well. These water samples will be collected and analyzed for possible contaminants present according to CECC groundwater sampling protocol and QA/QC. These samples will be stored in the laboratory pending a decision to analyze, if required. If analyzed, standard laboratory procedures will be used. Samples not analyzed will be discarded.

All well development tools shall be thoroughly cleaned immediately before each well development. Well development shall begin with bailing using either a stainless steel or teflon bailer. This procedure will remove heavy sediments from within each well casing, reducing the possibility of the well screen abrasion and pump damage during subsequent pumping. Wells shall be bailed until water samples contain only trace amounts of fine to coarse sand, as measured in sampling jars after 15 minutes of settling.

The wells will be mechanically surged with a surge or flapper block for 15 strokes or 30 minutes, whichever is less. The block will be lowered to the well plug and then carefully drawn up to the top of the well screen or until it emerges from the water. For wells in moderate soils, the rate of surging will be progressively increased with each stroke. When working in areas of loose sediments, surging will be at a constant, slow stroke rate. Areas of dense or over-compacted sediments may require more vigorous surging. Between surging episodes, the wells will be bailed and/or pumped to remove the sediment-rich water generated.

After surging, wells under development will be pumped using stainless steel 3-inch positive displacement development pumps, 2-inch bladder pumps or other appropriate equipment. In this procedure, the pumps will operate at maximum rate which is less than the recharge rate of the pumped well. For complete development, the wells will be pumped until: (1) the discharge is clear or nearly clear; and (2) the turbidity has not noticeably changed with one-half hour.

All water and sediment generated by well development shall be collected in clean, 55-gallon steel drums unless only a small volume (less than 100 gallons) is produced. Drums of this development water will be temporarily contained onsite, pending sampling and laboratory analysis. Non-hazardous development waters shall be disposed of by surface dumping (small volumes) or sewerage. Potentially hazardous development water shall be properly disposed of at a suitable hazardous waste disposal site or properly treated for non-hazardous discharge. Small volumes of development water may be disposed of by surface dumping if, in the opinion of the onsite geologist, potential contamination to the environment is minimal.

APPENDIX E

Groundwater Sampling

GROUNDWATER SAMPLING

Groundwater samples shall be collected for laboratory analysis by the following procedures:

1. Before sampling or purging begins, all bailers, pumps, cables and lines will be steam-cleaned. An established and designated cleaning area will be kept clean by lining with visqueen or using a cleaning rack.

2. A pre-purge sample shall first be obtained with a bailer from as deep in the well as possible. Standard "Water Sampling Field Survey Forms" will be filled out for this and all future samples, to include the following information:

   - Depth to water and total depth of water column, measured and recorded before purging begins;

   - Conductivity, checked and recorded for every 5 gallons of purged water (for small volumes); and

   - Purged volume (as appropriate), with stabilized readings for pH, conductivity and temperature.

The well shall then be bailed or pumped to remove four to ten well volumes prior to sampling. The well will be purged until conductivity has been stabilized. "Stabilized" is defined as three consecutive readings within 15% of one another. A casing volume will be based on actual measurements made on the day of sampling, i.e., the total depth minus depth to water on day of sampling, time the cross-sectioned area of the casing.

If the well is emptied before four to ten well volumes are removed, the sample shall be taken when the water level in the well recovers to 80% of its initial water level or better.

Whenever possible, samples will be collected within 24 hours after purging; ideally, samples will be collected immediately after purging.

Following the required volume of evacuation from the well, the sample shall be obtained with a teflon or stainless steel bailer on a 60-pound monofilament or polypropylene (washed) line. Care will be taken to properly clean cables with braided stainless steel cable or plastic coverings, if used. Air lift sampling and bladder pumps shall not be used.

Unless specifically waived or changed by the local, prevailing regulatory agency, water samples shall be handled and preserved according to the latest EPA methods as described in the Federal Register (Volume 44, No. 233, Monday, December 3, 1979, Page 69544, Table II) for the type of analysis to be performed.

Purge water will be properly disposed of or temporarily contained in steel barrels pending chemical analysis to designate proper disposal procedure.

APPENDIX F

Chain-of-Custody

CHAIN-OF-CUSTODY

SAMPLE COLLECTION, HANDLING AND IDENTIFICATION

Sample collection, handling, and identification will follow the guidelines set by the California Department of Health Services. Field records will be completed when the sample is collected and will be signed or initialed, including the date and time, by the sample collector(s). Field records will contain the following information:

1. Unique sample or log number;
2. Date and time;
3. Source of sample (including name, location and sample type);
4. Preservative used;
5. Analyses required;
6. Name of collector(s);
7. Pertinent field data (pH, DO, C1, residual, etc.); and
8. Serial number on seals and transportation cases.

Each sample will be identified by affixing a pressure sensitive, gummed label, or standardized tag on the container(s). This label will contain the sample identification number, date and time of sample collection, source of sample preservative used, and the collector(s) initial(s). Analysis required will be identified. Where a label is not available, the same information will be affixed to the sample contained with an indelible, waterproof, marking pen.

The sample container will be placed in a transportation case along with the chain-of-custody record form, pertinent field records, and analyses request form. The transportation case will then be sealed and labeled. Records will be filled out legibly in pen.

TRANSFER OF CUSTODY AND SHIPMENT

When transferring the possession of the samples, the transferee will sign and record the date and time on the chain-of-custody record. Custody transfer, if made to a sample custodian in the field, will account for each individual sample, although samples may be transferred as a group.

The field custodian or field inspector will be responsible for properly packaging and dispatching samples to the appropriate laboratory for analysis. This responsibility includes filling out, dating, and signing the appropriate portion of the chain-of-custody record.

All packages sent to the laboratory will be accompanied by the chain-of-custody record and other pertinent forms. A copy of these forms will be retained by the originating office.

Mailed packages can be registered with return receipt requested. If packages are sent by common carrier, receipts should be retained as part of the permanent chain-of-custody documentation.

Samples to be shipped will be sealed locked so evidence of tampering may be readily detected.

LABORATORY CUSTODY PROCEDURES

Chain-of-custody procedures will be followed in the laboratory from the time of sample receipt to the time the sample is discarded.

The sample control officer (SCO) will be the designated custodian, and an alternate is designated to act as custodian in the custodian's absence. All incoming samples are received by the SCO, who shall indicate receipt by signing the accompanying custody forms and who shall retain the signed forms as permanent records.

The SCO will maintain a permanent log book to record, for each sample, the person delivering the sample, the person receiving the sample, date and time received, source of sample, sample identification or log number, how transmitted to the laboratory, and condition received (sealed, unsealed, broken container, or other pertinent remarks). A standardized format will be established for log book entries.

A clean, dry, isolated room, building, and/or refrigerated space that can be securely locked from the outside, will be designated as a "sample storage security area."

The SCO will ensure that heat-sensitive, light-sensitive samples, radioactive, or other sample materials having unusual physical characteristics, or requiring special handling, are properly stored and maintained prior to analysis.

Only the custodian will distribute samples to the section leaders who are responsible for the laboratory performing the analysis.

The laboratory area will be maintained as a secured area, restricted to authorized personnel only.

Laboratory personnel will be responsible for the care and custody of the sample once it is received by them. These personnel shall be prepared to testify that the sample was in their possession and view, or secured in the laboratory at all times, from the moment it was received from the SCO, until the time that the analyses are completed.

Once the sample analyses are completed, the unused portion of the sample, together with all identifying labels, will be returned to the SCO. The returned tagged sample will be retained in the custody room until permission to destroy the sample is received by the SCO.

Samples will be destroyed only upon the order of the Laboratory Director, in consultation with previously-designated Project Manager, and/or client, or when it is certain that the information is no longer required or the samples have deteriorated. The same procedure will apply to tags and laboratory records.

APPENDIX G

Drum Handling Procedures

OUTLINE OF DRUM HANDLING PROCEDURES

1. Complete drummed worksheets onsite, forward a copy to Shell.

2. Test material per Shell's site-specific test requirements.

3. Classify Material as: Clean/Non-Hazardous/Hazardous

4. Labeling of Drums

   - Pending Label: Used to describe material pending final analytical testing. Labels must be immediately affixed to drum during field work.

   - Non-Hazardous Label: Required within 48 hours after analytical results are received.

   - Hazardous Label: Required within 48 hours after analytical results are received.

   - For Pick-Up Label: Must be affixed to drum prior to Shell Hazardous Waste Coordinator arranged pick-up date.

5. Remove within 14 days of date of generation. Empty drums, where material was disposed in bulk, must be removed the same day they are emptied.

6. Dispose of Material:

   - Clean: Any local landfill
   - Non-Hazardous: Class III landfill. If a Class III landfill will not accept, contact Shell Hazardous Waste Coordinator for assistance
   - Hazardous: Class I landfill arranged by Shell Hazardous Waste Coordinator.

   Mail or FAX completed Hazardous Waste Pick-Up Forms to the Shell Hazardous Waste Coordinator with a copy of the analytical results and worksheets.

7. If required, contact the Shell Hazardous Waste Coordinator:

   Shell Oil Company
   Hazardous Waste Coordinator
   Anna Sampson
   P.O. Box 6249
   Carson, California 90749
   Phone: (213) 816-2037
   FAX: (213) 816-2114

8. Manifests may be signed by the onsite contractor or consultant, station dealer, or other authorized Shell Oil representatives. The transporter CAN NOT sign the manifest.

   IT IS THE RESPONSIBILITY OF THE CONTRACTOR/CONSULTANT TO ARRANGE FOR A PERSON TO SIGN THE MANIFEST ON THE DAY OF PICK-UP.

9. Reporting

   All reports must be received by the Shell Hazardous Waste Coordinator within 7 working days of disposal. Reports shall include the following:

   - Completed drummed soil and water worksheets.
   - Attach a copy of the analytical results.
   - State how and where material was disposed.
   - If drums are emptied and material was disposed in bulk, state how empty drums were handled.
   - The signed blue and yellow copies of the hazardous waste manifest.

SOIL:

1. Test Requirements and Methods: Per Shell's site-specific test requirements

   - TPH: EPA Method 8015

   - BTEX: EPA Method 8020

   - Lead:

     -One composite sample from each boring
     -See attached decision tree
     -Total Lead - EPA Method 7421
     -Inorganic (soluble) Lead - DOS Title 22, Waste Extraction Test, §22-66700

   - Ignitable:

     -One composite sample from each boring
     -Bunsen Burner Test Flame Test

2. Classification:

   - Clean: TPH, BTEX, and Lead non-detectable

   - Non-Hazardous if any are true:

     -TPH less than 1000 ppm

-Lead -Inorganic (soluble) Lead less than 5 ppm (STLC)
or less than 100 ppm (TTLC)
-Organic Lead less than 13 ppm (TTLC)

-Ignitable - If TPH < 1000 ppm do not conduct test

- Hazardous if any are true:

-TPH greater than 1000 ppm

-Lead -Inorganic (soluble) Lead greater than 5 ppm (STLC)
or greater than 1000 ppm (TTLC)
-Organic Lead greater than 13 PPM (TTLC)

-Ignitable -If TPH >1000 ppm, then conduct Bunsen Burner Test
-If soil burns vigorously and persistently, soils are RCRA D001

3. Responsibility for Disposal:
   - Clean: Consultant/Contractor
   - Non-Hazardous: Consultant/Contractor or Shell Hazardous Waste Coordinator
   - Hazardous: Shell Hazardous Waste Coordinator
4. Types of Drums: DOT-17H for a solid, solidified, or sludge material.
5. Disposal Facility:
   - Clean: Any local landfill
   - Non-Hazardous: Class III landfill. If a Class III landfill will not accept, contact Shell Hazardous Waste Coordinator for assistance
   - Hazardous: Class I landfill arranged by Shell Hazardous Waste Coordinator

WATER:

1. Test Requirements and Methods: Per Shell's site-specific test requirements.
   - TPH: EPA Method 8015
   - BTEX: EPA Method 602
2. Classification:
   - Clean Water: TPH and BTEX non-detectable

- Non-Hazardous:

  -Water with dissolved product and detectable TPH and BTEX
  -Water with free product
  -Free product only

3. Responsibility for Disposal:

   - Clean: Consultant/Contractor

   - Non-Hazardous: Consultant/Contractor or Shell Hazardous Waste Coordinator

4. Types of Drums: DOT-17C or DOT-17E for liquid or slurry

5. Disposal Facility:

   - Clean Water: Into dealer's sanitary sewer or with proper approval from Water Board to storm sewer

   - Non-Hazardous:

     Water with TPH and BTEX only -

     -Into dealer's sanitary sewer with approval from the POTW
     -Contact Shell Hazardous Waste Coordinator to arrange disposal

     Water with free product -

     -Contact Shell Hazardous Waste Coordinator to arrange disposal

   - Hazardous:

     Free product only -

     -Contact Shell Hazardous Waste Coordinator to arrange disposal