CONVERSE ENVIRONMENTAL WEST

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September 28, 1990
88-44-361-20-896

Ms. Dyan Whyte
Water Resources Control Engineer
Regional Water Quality Control Board
1800 Harrison, Room 700
Oakland, California 94612

Subject: Transmittal of Quarter 3, 1990 Progress Report
Shell Retail Service Station
500 40th Street
Oakland, California

Dear Ms. Whyte:

Attached is a progress report describing the activities and findings for the Shell Oil Company site (Shell) located at 500 40th Street in Oakland, California, during Q3/90.

Please call if you have any questions.

Very truly yours,

Converse Environmental West

Bojan Gustincic
Project Geologist

BG:gts

cc: Mr. [redacted]id - Alameda County Health Department (w/ encl.)
Mr. Charles R. Comstock - Converse Environmental West (w/o encl.)

500 40TH ST 2\WHYTE.896

REPORT OF ACTIVITIES
QUARTER 3, 1990

SHELL OIL COMPANY SITE
500 40th STREET
OAKLAND, CALIFORNIA

Prepared for:

Shell Oil Company
1390 Willow Pass Road, Suite 900
Concord, California 94520

Prepared by:

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September 28, 1990

CEW Project No. 88-44-361-20

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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 3, 1990 (Q3/90), for the former Shell Oil Company (Shell) station (site) located at 500 40th Street in Oakland, California (Drawing 1). This report is prepared to fulfill the quarterly reporting requirements (September 30, 1990) as specified in the Work Plan prepared by CEW (April, 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 northwest corner of 40th Street and Telegraph Avenue in Oakland, California (Drawing 2). The site location and setting are presented in Appendix A. The site was formerly operated as a retail motor vehicle fuel sales and automobile repair station. Presently, it is occupied by several non-industrial retail sale and service business. The site is approximately 145 feet long by 130 feet wide.

The purpose of the investigative activities is to provide additional data on subsurface conditions at the site in order to characterize the present lateral and vertical extent, and distribution, of existing petroleum hydrocarbon contamination resulting from the former operation of underground automobile fuel storage tanks at the site, and to assess the feasibility of applicable remedial technologies.

1.2 SCOPE OF ACTIVITIES

The work initiated and completed by CEW during Q3/90 consisted of the following activities:

- Sampling each well and analyzing the groundwater for total petroleum hydrocarbons as gasoline (TPH-g) as diesel (TPH-d) and benzene, toluene, ethylbenzene and xylenes (BTEX).

- The completion of the two groundwater wells one monitoring and one extraction well tank place during late Q2/90; these completion is presented in this report.

- Evaluating the findings from the field activities and preparing this Quarterly Report.

The installation of three offsite groundwater monitoring wells has been delayed due to the recent changes in permitting requirements by the City of Oakland for groundwater monitoring well installation. The city is now requiring that a notarized form be submitted by the owner of the site property. This replaces the previous requirement of an approval letter.

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 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 compilation of 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 numerous assumptions and limitations that are part of the process would require substantial discussion and justification, and

(2) The multiple working hypothesis process is iterative to the time of closure, at which point a final, best hypothesis will be provided and fully explained to the regulatory agencies in closure documentation.

SECTION 2

WORK COMPLETED THIS QUARTER

Work initiated and completed during Q3/90 followed the task descriptions of the CEW Work Plan (April, 1989) and the CEW protocols on file with the regulatory agencies of jurisdiction. The site activity summary is presented in Table 1.

2.1 GROUNDWATER SAMPLING AND ANALYSES

Following CEW QA/QC protocols (Appendix E), groundwater samples were collected on August 28 and 29, 1990, from 4 onsite and 3 offsite wells. Wells MW-8 and EW-1 were sampled previously on July 3, 1990, and samples were submitted to NET Pacific, Inc., a California-certified laboratory located in Santa Rosa, California. Following the recommended analytical methods listed in Table 2, the samples were analyzed for TPH-g, TPH-d, and BTEX. Analytical data for the groundwater samples collected from the monitoring wells are summarized in Table 3. Analytical laboratory reports and chain-of-custody forms from this quarterly round of monitoring are provided in Appendix C.

2.2 GROUNDWATER MONITORING

During Q3/90, all wells were physically monitored for depth-to-water and observed for floating product, its thickness and odor, if any. A summary of groundwater monitoring information is presented in Table 4.

2.3 GROUNDWATER MONITORING WELL INSTALLATION

An onsite groundwater monitoring well (MW-8) and 6-inch diameter extraction well (EW-1) were installed on June 27 and 28, 1990 (Q2/90). The location of the wells is shown on Drawing 2. The wells were completed to a total depth of approximately 39 feet below ground surface (bgs). No additional groundwater monitoring wells were installed during Q3/90. The summary of well installation is presented in Table 6. Groundwater monitoring well completion diagrams are presented in Appendix D.

SECTION 3

FINDINGS AND DISCUSSION

3.1 SOIL

3.1.1 Stratigraphy

Available lithologic information from previously drilled onsite soil borings indicate that subsurface soils consist of silty clay with local laterally discontinuous layers of silty fine sand and silty gravel, to the depth of approximately 23 feet bgs. The installation of two new onsite wells, EW-1 and MW-8, show silty clays to the depth of approximately 20 feet bgs, which grade into a thick layer of sandy gravel. This sandy gravel, approximately 20 feet thick, is underlain by a silty clay. The silty clay was confirmed to the depth of 5 feet below the sandy gravel as specified in CEW protocols (Appendix C). A stratigraphic profile is shown in geologic cross-sections A-A' and B-B' (Drawings 3 and 4). Stratigraphy is interpreted from borings logs presented in Appendix D.

3.1.2 Results of Chemical Analyses

Analytical results of soil samples collected during the installation of wells MW-8 and EW-1, indicate the presence of petroleum hydrocarbons in concentrations above analytical laboratory detection limits.

Analytical results of soil samples collected during the installation of well MW-8 were all below detectable levels. A soil sample from well EW-1 collected at the depth of 6 feet bgs showed the presence of total petroleum hydrocarbons as motor oil (TPH-mo) at the concentration of 21 mg/Kg, and xylenes at 0.0081 mg/Kg. Soil sample from the same well collected at the depth of 10 feet bgs showed the presence of total petroleum hydrocarbons as gasoline (TPH-g) at the concentration of 100 mg/kg. Total petroleum

hydrocarbons as diesel (TPH-d) and BTEX were also present in detectable concentrations. A summary of soil chemical analyses is presented in Table 6.

3.1.3 Discussion

Soil analytical results from well EW-1 show the presence of petroleum hydrocarbons in soil to the depth of 10 feet bgs. Soil boring logs for this interval show a gravelly lense which may act as a conduit for hydrocarbons. This gravelly lense grades into a silty clay lense which possibly acts as an impermeable boundary to water table.

3.2 GROUNDWATER

3.2.1 Physical Parameters

During Q3 onsite wells EW-1, MW-2, MW-3, MW-4, MW-5, MW-8, and offsite wells OMW-6, OMW-9 and OMW-10 were monitored for depth-to-water and presence of floating product. No floating product was detected in any of the wells. Petroleum odor was detected in one onsite (MW-2), and all three offsite wells (OMW-6, OMW-9, and MW-10). A summary of Q3/90 groundwater monitoring is presented in Table 4.

3.2.2 Elevation and Gradient

Groundwater elevations ranged from 68.78 feet above mean sea level (MSL) in well MW-2 to 65.15 feet MSL in well EW-1. Groundwater flow appears to be trending to the west and southwest towards the San Francisco Bay, with an approximate gradient of 0.04 ft/ft (Drawing 5).

3.2.3 Results of Chemical Analyses

Groundwater analytical results made available during Q3/90 indicate no significant changes in the onsite groundwater quality (Table 3). Wells MW-4 and MW-5, located near the northeastern site boundary, contained no detectable chemical concentrations. Groundwater analytical results collected during Q3/90 have further confirmed the upgradient northeastern contaminant plume boundary, established in Q4/89.

In the offsite area, cross and downgradient from the site, all monitoring wells showed chemical concentrations above detection levels. Water quality data from the offsite wells indicate that the contaminant plume is extended in the downgradient direction to the west. Offsite well OMW-6, located approximately 30 feet downgradient from the site, indicated that the dissolved petroleum hydrocarbon plume extends into 40th Street. Based on the available offsite soil and groundwater quality data, the possibility of offsite contamination source cannot presently be excluded. The groundwater chemical concentration contours for TPH-g, TPH-d and benzene are presented in Drawings 6, 7 and 8 respectively.

SECTION 4

NEXT QUARTER ACTIVITIES

4.1 PROPOSED ACTIVITIES

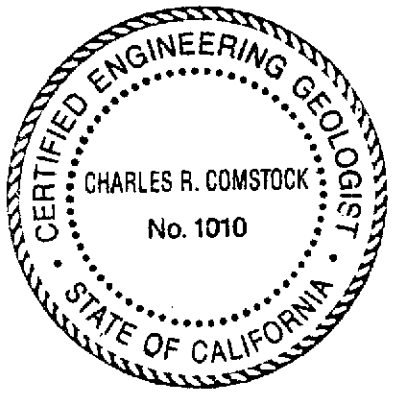
During Q3/90, Shell plans to continue the investigation of the lateral extent of groundwater contamination in the downgradient direction to the west, along 40th Street. Three offsite groundwater monitoring wells are planned to be installed on 40th Street when the permits for encroachment and excavation are granted by the City of Oakland, Department of Planning and Development. The monitoring well installation will be conducted in accordance with CEW standard operating procedures and revised Work Plan dated April 7, 1989.

CERTIFICATION

This report of activities for the Shell Oil Company facility at 500 40th Street, 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,



BOJAN GUSTINCIC
Project Geologist

CHARLES R. COMSTOCK
Technical Director

PRIMARY CONTACTS

Shell Oil Company Facility
500 40th Street
Oakland, California

Quarter 3, 1990

Regional Water Quality Control Board Representative:	Ms. Dyan Whyte San Francisco Bay Regional Water Quality Control Board 1800 Harrison Street, Room 700 Oakland, California 94612
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Converse Project Manager:	Mr. Bojan Gustincic 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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TABLE 1. ACTIVITY SUMMARY - QUARTER 3, 1990

Shell Oil Company Facility
500 40th Street
Oakland, California

	PERCENT COMPLETE			
	Quarter 3, 1990		Total to Date	
Activity	Onsite	Offsite	Onsite	Offsite
Soil Characterization	10	0	40	5
Groundwater Characterization (Dissolved Product)	10	0	35	10
Groundwater Characterization (Floating Product)	NA	NA	NA	NA
Soil Remediation	0	-----	0	-----
Groundwater Remediation (Dissolved Product)	0	-----	0	-----
Groundwater Remediation (Floating Product)	NA	NA	NA	NA

NOTE:

NA Not Applicable

TABLE 2. RECOMMENDED MINIMUM VERIFICATION ANALYSES FOR UNDERGROUND TANK LEAKS

From: RWQCB Guidelines for Additional Fuel Tank Leaks (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 & 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 & 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 & BTEX	8260		
Diesel	TPH-d	GCFID (3550)	TPH-d	GCFID (3510)
	BTEX	8020 or 8240	BTEX	602, 624 or 8260
	TPH & BTEX	8260		
Jet Fuel	TPH-d	GCFID (3550)	TPH-d	GCFID (3510)
	BTEX	8020 or 8240	BTEX	602, 624 or 8260
	TPH & 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 & BTEX	8260	CL HC & BTEX	8260
Non Chlorinated Solvents	TPH-d	GCFID (3550)	TPH-d	GCFID (3510)
	BTEX	8020 or 8240	BTEX	602 or 624
	TPH & BTEX	8260	TPH & 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 & 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 3. SOIL ANALYTICAL RESULTS (PPM)

Shell Oil Company
500 40th Street
Oakland, California

Boring No.	Sample Depth (ft. bgs)	TPH-g	TPH-d	TPH-mo	Benzene	Toluene	Ethyl-Benzene	Xylene	Total Lead
MW-2	5,10,15	<10	<10	<10	<0.025	0.028	<0.075	<0.075	0.4
MW-2	10	<10	<10	<10	<0.025	<0.025	<0.075	<0.075	1.0
MW-3	5,10,15	28	<10	<10	0.054	0.032	<0.075	0.099	<0.2
MW-3	5,10,15	<10	<10	<10	<0.025	<0.025	<0.075	<0.075	<0.2
MW-4	10	<10	<10	<10	<0.025	<0.025	<0.075	<0.075	<0.2
MW-4	5,10	<10	<10	<10	<0.025	<0.025	<0.075	<0.075	<0.2
MW-5	4	<10	<10	<10	<0.025	<0.025	<0.075	<0.075	12
MW-5	8	<10	<10	27	<0.025	<0.025	<0.075	<0.075	5.3
MW-5	12	<10	<10	18	<0.025	<0.025	<0.075	<0.075	3.3
MW-5	16	<10	<10	<10	<0.025	<0.025	<0.075	<0.075	5.7
OMW-6	5	<10	1	<10	<0.025	<0.025	<0.075	<0.075	4.3
OMW-6	10	18	17	<10	0.028	0.040	0.10	0.45	3.2
OMW-6	15	<10	<1	<10	<0.025	<0.025	<0.075	<0.075	3.6
OMW-9	5	<10	<1.0	<10	<0.025	<0.025	<0.075	<0.075	3.1
OMW-9	10	210	40	<10	0.064	0.46	1.1	6.3	2.6
OMW-9	15	11	<1.0	<10	<0.025	<0.025	<0.075	<0.075	4.3
OMW-9	20	<10	<1.0	<10	<0.025	<0.025	<0.075	<0.075	3.1
OMW-10	5	<1.0	<1.0	<10	<2.5	<2.5	<2.5	<2.5	5.5
OMW-10	10	<1.0	<1.0	<10	20	4.4	8.4	24	4.3
OMW-10	15	<1.0	<1.0	<10	<2.5	<2.5	<2.5	<2.5	6.9
MW-8	6	<1.0	<1.0	<10.0	<0.0025	<0.0025	<0.0025	<0.0025	5.4
MW-8	10	<1.0	<1.0	<10.0	<0.0025	<0.0025	<0.0025	<0.0025	5.4
MW-8	15	<1.0	<1.0	<10.0	<0.0025	0.0027	<0.0025	<0.0025	4.4
MW-8	20	<1.0	<1.0	<10.0	<0.0025	<0.0025	<0.0025	<0.0025	5.8
EW-1	6	<1.0	<1.0	21.0	<0.0025	<0.0025	<0.0025	0.0081	9.1
EW-1	10	110	4.4	<10.0	0.028	0.380	0.410	1.600	3.3
EW-1	15	<1.0	<1.0	<10.0	<0.0025	0.005	<0.0025	0.0029	3.0
EW-1	20	<1.0	<1.0	<10.0	<0.0025	<0.0025	<0.0025	<0.0025	4.8

TABLE 4. GROUNDWATER MONITORING INFORMATION

Shell Oil Company Facility
500 40th Street
Oakland, California

Well No.	Date Monitored	Well Elevation (ft msl)	Depth to Water (ft bgs)	Water Table Elevation (ft msl)	Petroleum Odor In Water	Floating Product Thickness (inches)	Comments
EW-1	8/28/90	78.26	13.11	65.15	No	0.0	
MW-2	6/19/89	80.80	11.91	68.89	No	0.0	
MW-2	7/18/89		11.98	68.82	No	0.0	
MW-2	8/08/89		12.00	68.80	Yes	0.0	
MW-2	9/11/89		12.00	68.80	No	0.0	
MW-2	10/10/89		12.05	68.75	Yes	0.0	
MW-2	1/05/90		10.95	69.85	No	0.0	
MW-2	3/02/90		11.54	69.26	Yes	0.0	
MW-2	5/31/90		11.08	69.72	Yes	0.0	
MW-2	**8/28/90**		**12.02**	**68.78**	**Yes**	**0.0**	
MW-3	6/19/89	79.60	10.99	68.61	No	0.0	
MW-3	7/18/89		11.05	68.55	Yes	0.0	
MW-3	8/08/89		11.07	68.53	Yes	0.0	
MW-3	9/11/89		11.02	68.58	Yes	0.0	
MW-3	10/10/89		11.08	68.52	Yes	0.0	
MW-3	1/05/90		10.97	68.63	No	0.0	
MW-3	3/02/90		10.91	68.69	Yes	0.0	
MW-3	5/31/90		10.23	69.37	No	0.0	
MW-3	**8/28/90**		**11.02**	**68.58**	**No**	**0.0**	
MW-4	6/19/89	81.00	12.18	68.82	No	0.0	
MW-4	7/18/89		12.21	68.79	No	0.0	
MW-4	8/08/89		12.23	68.77	No	0.0	
MW-4	9/11/89		12.26	68.74	No	0.0	
MW-4	10/10/89		12.28	68.72	No	0.0	
MW-4	1/05/90		12.25	68.50	No	0.0	
MW-4	3/02/90		11.63	69.37	No	0.0	
MW-4	5/31/90		11.52	69.48	No	0.0	
MW-4	**8/28/90**		**12.26**	**68.74**	**No**	**0.0**	
MW-5	10/10/89	81.50	11.08	70.42	No	0.0	
MW-5	1/05/90		12.96	68.54	No	0.0	
MW-5	3/02/90		12.66	68.84	No	0.0	
MW-5	5/31/90		12.39	69.11	No	0.0	
MW-5	**8/28/90**		**12.94**	**68.56**	**No**	**0.0**	
MW-8	8/28/90	79.91	12.95	66.96	No	0.0	

TABLE 4 (cont'd). GROUNDWATER MONITORING INFORMATION

Shell Oil Company Facility
500 40th Street
Oakland, California

Well No.	Date Monitored	Well Elevation (ft msl)	Depth to Water (ft bgs)	Water Table Elevation (ft msl)	Petroleum Odor In Water	Floating Product Thickness (inches)	Comments
OMW-6	1/05/90	77.90	10.23	67.67	No	0.0	
OMW-6	3/02/90		9.40	68.50	No	0.0	
OMW-6	6/1/90		9.81	68.09	Yes	0.0	
OMW-6	**8/28/90**		**10.18**	**67.72**	**Yes**	**0.0**	
OMW-9	1/05/90	77.71	9.90	67.81	No	0.0	
OMW-9	3/04/90		9.20	68.51	Yes	0.0	
OMW-9	6/1/90		9.50	68.21	Yes	0.0	
OMW-9	**8/28/90**		**9.88**	**67.83**	**No**	**0.0**	
OMW-10	1/05/90	77.91	9.92	67.99	No	0.0	
OMW-10	3/04/90		9.20	68.71	No	0.0	
OMW-10	6/1/90		9.42	68.49	Yes	0.0	
OMW-10	**8/28/90**		**9.89**	**68.02**	**No**	**0.0**	

NOTES:

ft bgs feet below ground surface
Bold **Boldface** indicates work completed this quarter.

TABLE 5. RESULTS OF GROUNDWATER CHEMICAL ANALYSES

Shell Oil Company Facility
500 40th Street
Oakland, California

Well No.	Sample Date	Concentration (mg/l) TPH-g	TPH-d	Benzene	Toluene	Ethyl-Benzene	Xylenes	Lead
MW-2	06/20/89	0.8	<0.01	0.046	0.0068	0.0027	0.056	NA
MW-2	07/18/89	1.4	0.4	0.033	0.0056	0.024	0.073	0.003
MW-2	08/08/89	0.230	0.50	0.0045	<0.0005	<0.0015	0.011	NA
MW-2	09/11/89	0.50	0.31	0.019	0.0023	<0.0015	0.010	NA
MW-2	10/10/89	2.0	0.81	0.077	0.0084	0.024	0.150	NA
MW-2	01/05/90	2.0	0.56	0.038	0.0056	0.030	0.059	NA
MW-2	03/02/90	1.9	0.58	0.095	0.0005	0.083	0.200	NA
MW-2	05/31/90	4.1	0.57	0.170	<0.0005	0.100	0.33	NA
MW-2[1]	05/31/90	5.2	0.51	0.200	<0.0005	0.120	0.39	NA
MW-2	**08/28/90**	**1.4**	**0.31**	**0.044**	**<0.0005**	**0.0029**	**0.067**	**NA**
MW-3	06/20/89	2.3	<0.1	0.18	0.15	0.054	0.800	NA
MW-3	07/18/89	1.5	9.1	0.085	0.034	0.010	0.120	0.002
MW-3	08/08/89	2.5	0.71	0.13	0.073	0.0035	0.330	NA
MW-3	09/11/89	1.9	0.23	0.18	0.074	0.0037	0.110	NA
MW-3	10/10/89	2.6	1.2	0.069	0.055	0.0063	0.300	NA
MW-3	01/05/90	2.7	0.76	0.051	0.041	0.028	0.070	NA
MW-3	03/02/90	2.3	0.57	0.23	0.8	0.055	0.230	NA
MW-3[1]	03/02/90	2.3	0.56	0.22	0.8	0.53	0.230	NA
MW-3	05/31/90	1.9	0.460	0.140	0.048	0.044	0.180	NA
MW-3	**08/28/90**	**1.5**	**0.28**	**0.140**	**0.050**	**0.038**	**0.170**	**NA**
MW-3[1]	**08/28/90**	**1.5**	**0.26**	**0.140**	**0.04905**	**0.036**	**0.170**	**NA**
MW-4	06/20/89	<0.05	<0.01	<0.0005	<0.0015	<0.0015	<0.0015	NA
MW-4	07/18/89	<0.05	<0.05	<0.0005	<0.0015	<0.0015	<0.0015	0.003
MW-4	08/08/89	<0.05	<0.05	<0.0005	<0.0005	<0.0015	<0.0015	NA
MW-4	09/11/89	<0.05	<0.05	<0.0005	<0.0005	<0.0015	<0.0015	NA
MW-4	10/10/89	<0.05	<0.05	<0.0005	<0.0005	<0.0015	<0.0015	NA
MW-4	01/05/90	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-4	03/02/90	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-4	05/31/90	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-4	**NS**							
MW-5	10/10/89	<0.05	<0.05	<0.0005	<0.0005	<0.0015	<0.0015	NA
MW-5	01/05/90	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-5	03/02/90	<0.05	0.11	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-5	05/31/90	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.005	NA
MW-5	**08/28/90**	**<0.05**	**<0.05**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**	**NA**
OMW-6	01/05/90	22	6.5	1.4	1.8	0.56	1.500	NA
OMW-6	03/04/90	27	4.6	1.3	1.4	0.63	2.400	NA
OMW-6[1]	03/04/90	25	4.8	1.2	1.3	0.55	2.300	NA
OMW-6	06/01/90	23	4.6	1.3	0.79	0.44	2.400	NA
OMW-6	**08/28/90**	**16**	**3.3**	**1.10**	**0.580**	**0.220**	**1.400**	**NA**

TABLE 5 (cont'd). RESULTS OF GROUNDWATER CHEMICAL ANALYSES

Shell Oil Company Facility
500 40th Street
Oakland, California

Concentration (mg/l)

Well No.	Sample Date	TPH-g	TPH-d	Benzene	Toluene	Ethyl-benzene	Xylenes	Lead
OMW-9	01/05/90	4.3	1.6	0.097	0.12	0.091	0.290	NA
OMW-9	03/04/90	2.6	1.0	0.058	0.024	0.0081	0.075	NA
OMW-9	06/01/90	2.9	0.49	0.085	0.020	0.013	0.085	NA
OMW-9	**08/28/90**	**1.5**	**0.26**	**0.140**	**0.049**	**0.036**	**0.170**	**NA**
OMW-10	01/05/90	<0.05	0.20	0.034	0.0011	0.0043	0.013	NA
OMW-10	03/04/90	0.29	0.39	0.053	0.0015	0.0043	0.015	NA
OMW-10	06/01/90	0.73	0.30	0.100	0.0019	0.015	0.025	NA
OMW-10	**08/28/90**	**0.36**	**0.36**	**0.064**	**0.0006**	**0.0022**	**0.0057**	**NA**
MW-8	**7/03/90**	**0.16**	**<0.05**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**	**NA**
EW-1	**7/03/90**	**0.40**	**<0.05**	**0.0032**	**0.0009**	**0.0007**	**0.0040**	**NA**

NOTES:

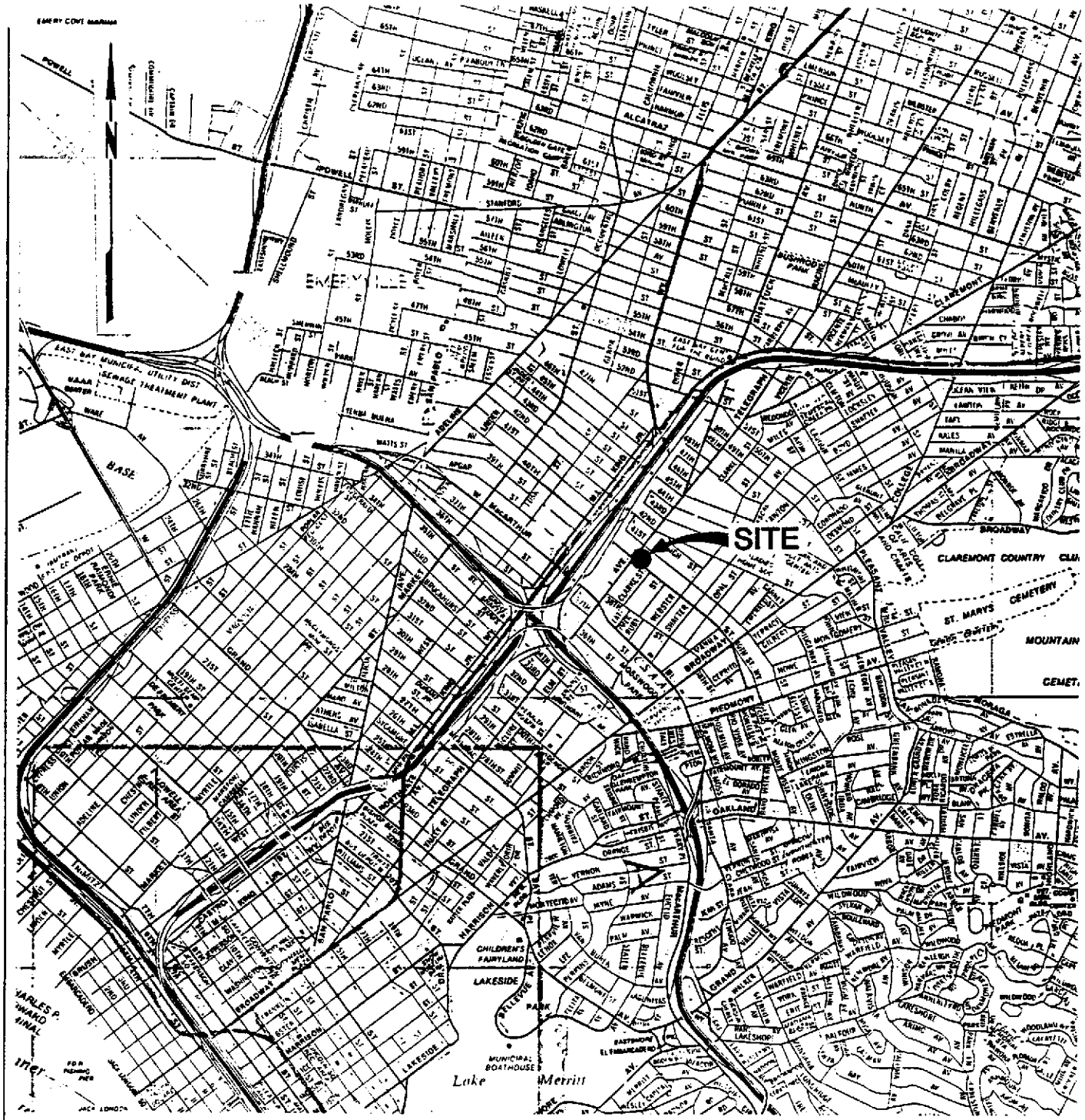
[1]	duplicate sample
ppm	part per million
TPH-g	total petroleum hydrocarbons as gasoline (GCFID)
TPH-d	total petroleum hydrocarbons as diesel (GCFID)
TPH-mo	total petroleum hydrocarbons as motor oil (GCFID)
NA	not analyzed
NS	not sampled this quarter
Bold	Boldface indicates work completed this quarter.

TABLE 6. SUMMARY OF GROUNDWATER MONITORING WELL INSTALLATIONS

Shell Oil Company
500 50th Street
Oakland, California

Well No.	Date Installed	Diameter Well Bore (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	68.78	25	20.0-9.0	9.0-7.0	7.0-0
MW-3	5/23/89	12	15.3	68.58	21	19.0-9.5	9.5-8.0	8.0-0
MW-4	5/23/89	12	13.0	68.54	20	15.5-9.5	9.5-7.5	7.5-0
MW-5	9/19/89	12	18.5	68.56	20	20.0-10.0	9.0-8.0	8.0-0
OMW-6	10/16/89	12	16.0	67.72	20	10.5-20.0	9.0-8.0	8.0-0
OMW-9	11/13/89	12	NA	67.72	30	17.5-7.5	6.5-5.5	5.5-0
OMW-10	11/13/89	12	NA	68.02	20	16.0-6.0	5.0-4.0	4.0-0
MW-8	6/27/90	12	20	66.96	39	39.-19	18-16	16-0
EW-1	6/28/90	12	24'	65.15	39	38.5-24.5	23-20	20-0

DRAWINGS



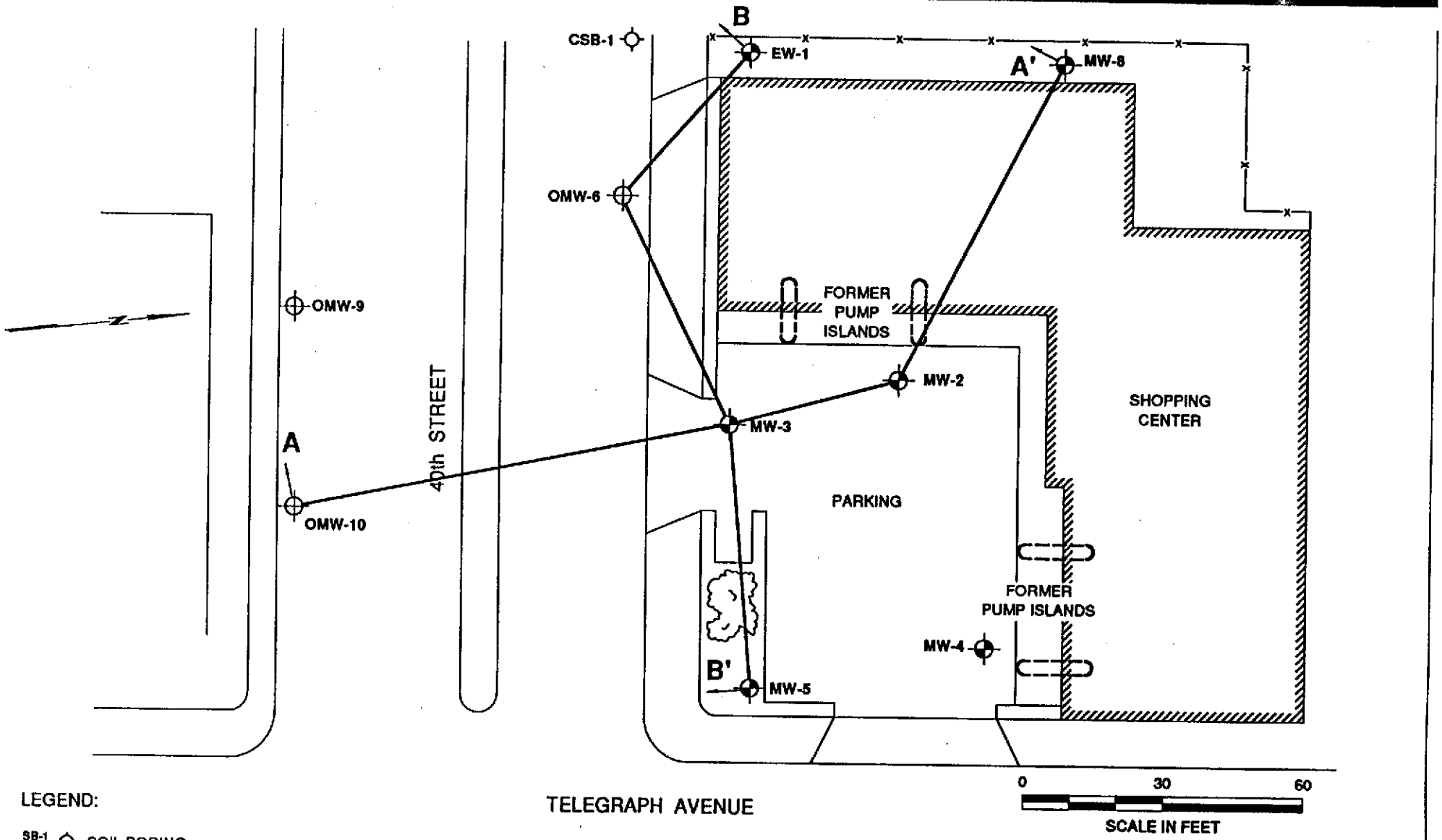
SOURCE: California State Automobile Association.

SITE LOCATION MAP

SHELL OIL COMPANY
500 40th Street
Oakland, California

Scale: AS SHOWN	Project No.: 88-44-361-20
Prepared by: KGC	Date: 9/30/90
Checked by: BG	Drawing No.: 1
Approved by: CRC	

Converse Environmental West



LEGEND:

SB-1 ○ SOIL BORING

MW-1 ⊕ GROUNDWATER MONITORING WELL

OMW-1 ⊕ OFFSITE GROUNDWATER MONITORING WELL

A A' LINE OF GEOLOGIC CROSS SECTION

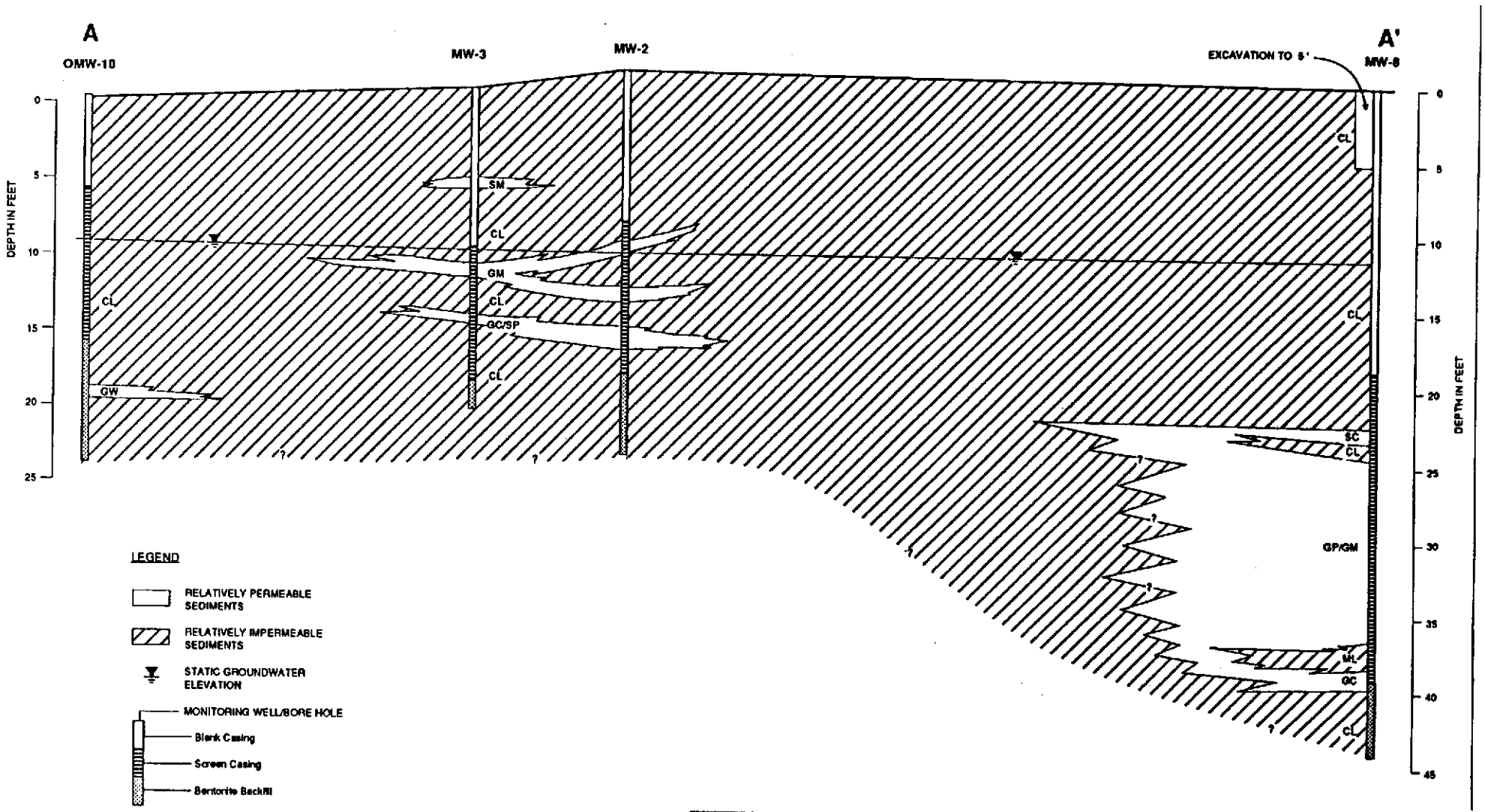
Base Map: Surveyed with Electronic Distance Meter by CEW, 1989

PLOT PLAN

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental West

Scale: AS SHOWN	Project No.: 88-44-361-20
Prepared by: CCH/CRB	Date: 9/21/90
Checked by: CCH	Drawing No.: 2
Approved by: BG	

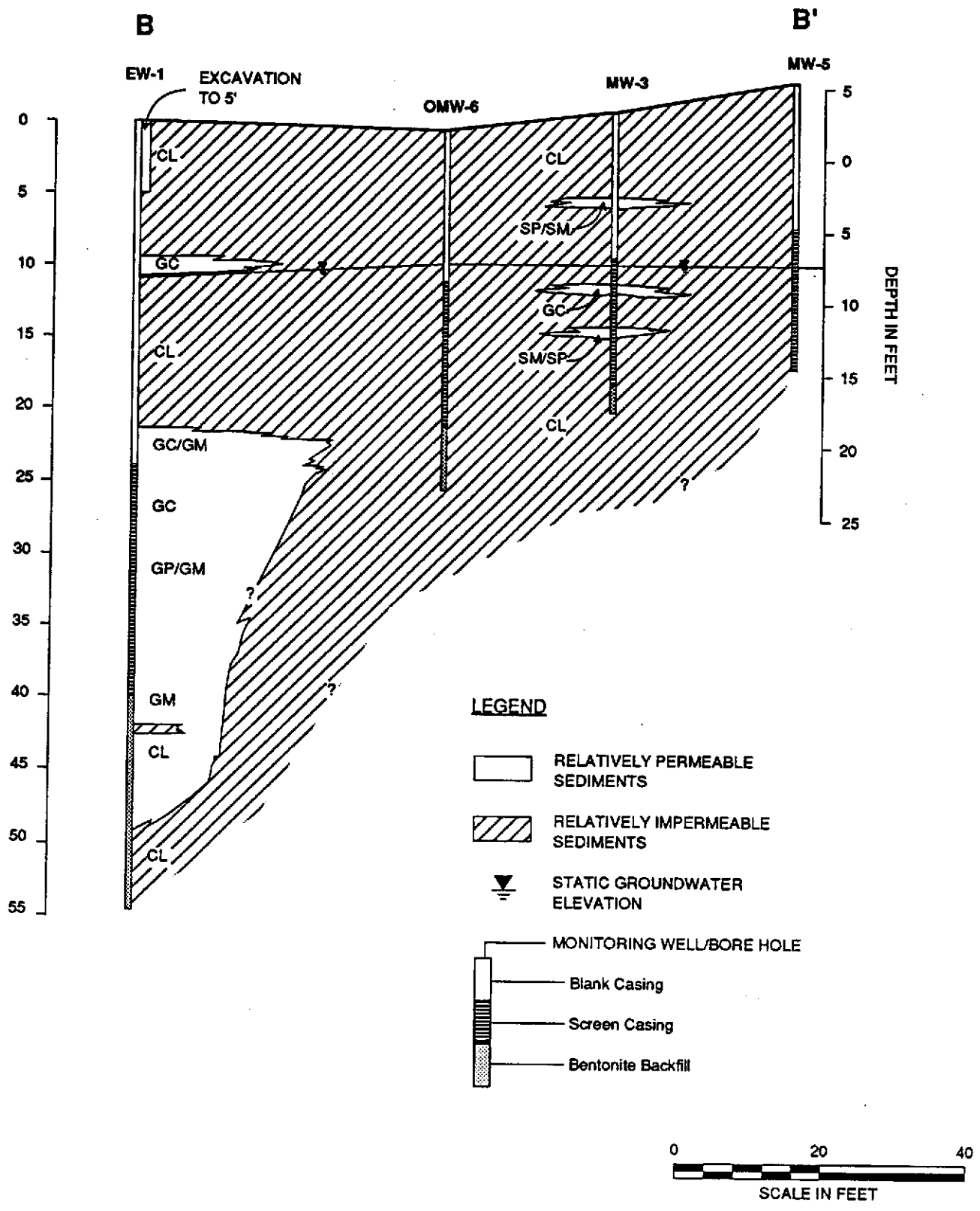


GEOLOGIC CROSS SECTION A-A'

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Project No.	88-44-361-20
Prepared by	DEN
Date	6/26/90
Checked by	SG
Drawing No.	3
Approved by	CRC

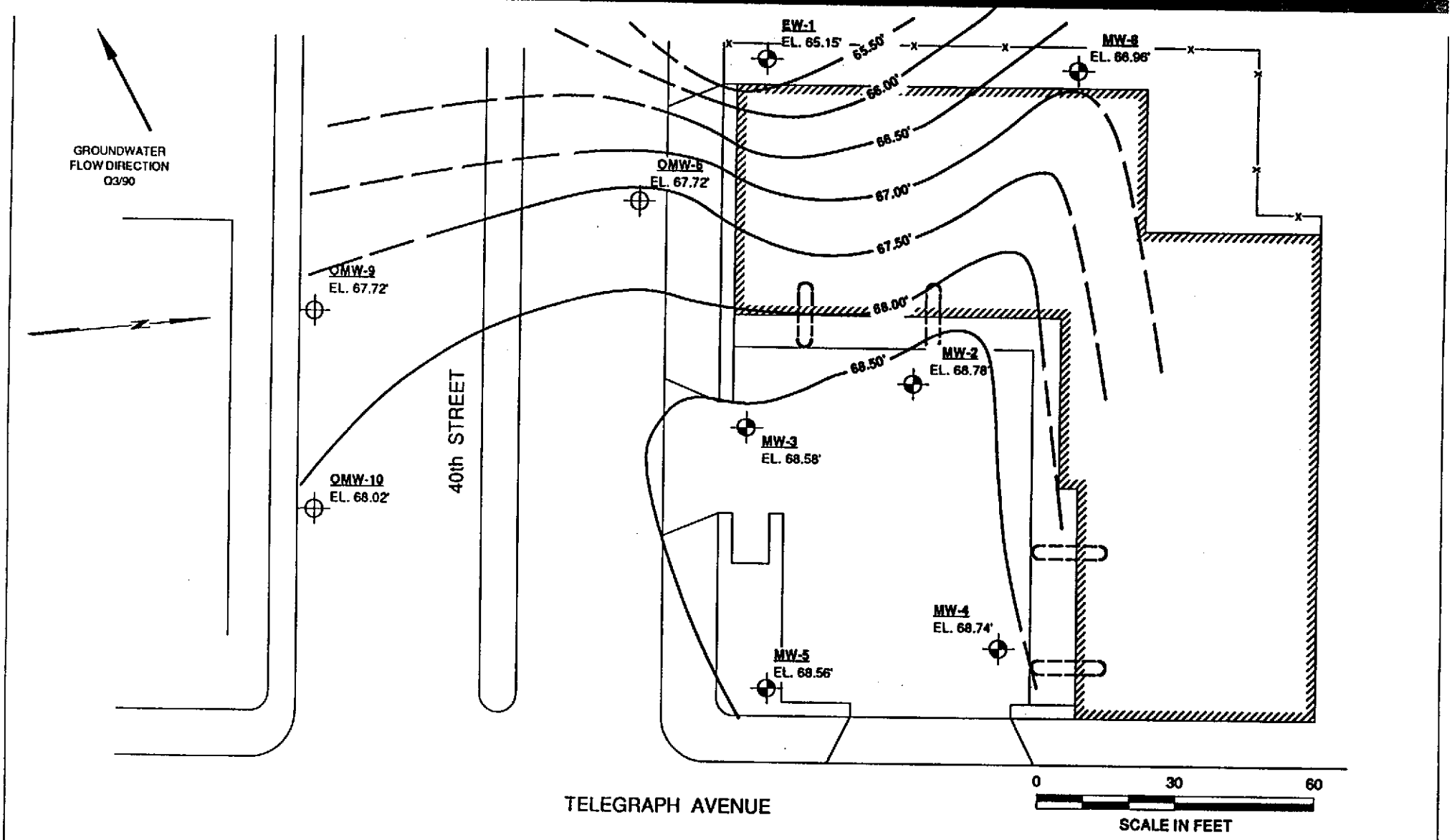


GEOLOGIC CROSS SECTION B-B'

SHELL OIL COMPANY
500 40th Street
Oakland, California

Scale: AS SHOWN	Project No.: 88-44-361-20
Prepared by: DEN/CRB	Date: 6/26/90
Checked by: BG	Drawing No.: 4
Approved by: CRC	

Converse Environmental West



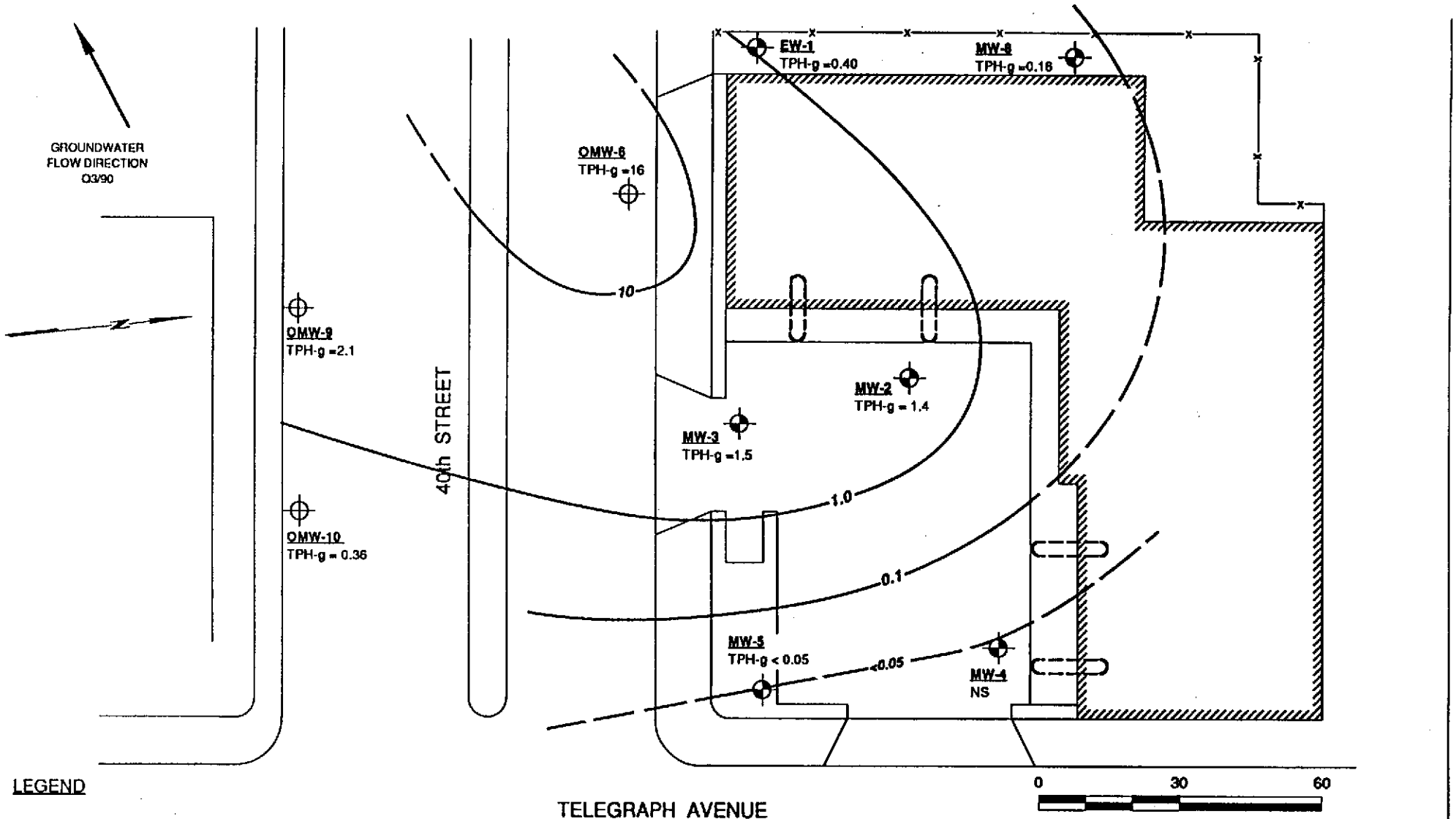
Base Map: Surveyed with Electronic Distance Meter by CEW, 1989

GROUND WATER CONTOUR MAP Q3/90

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental West

Scale: AS SHOWN	Project No.: 88-44-361-20
Prepared by: CCH/CRB	Date: 9/21/90
Checked by: CCH	Drawing No.: 5
Approved by: BG	



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

LEGEND

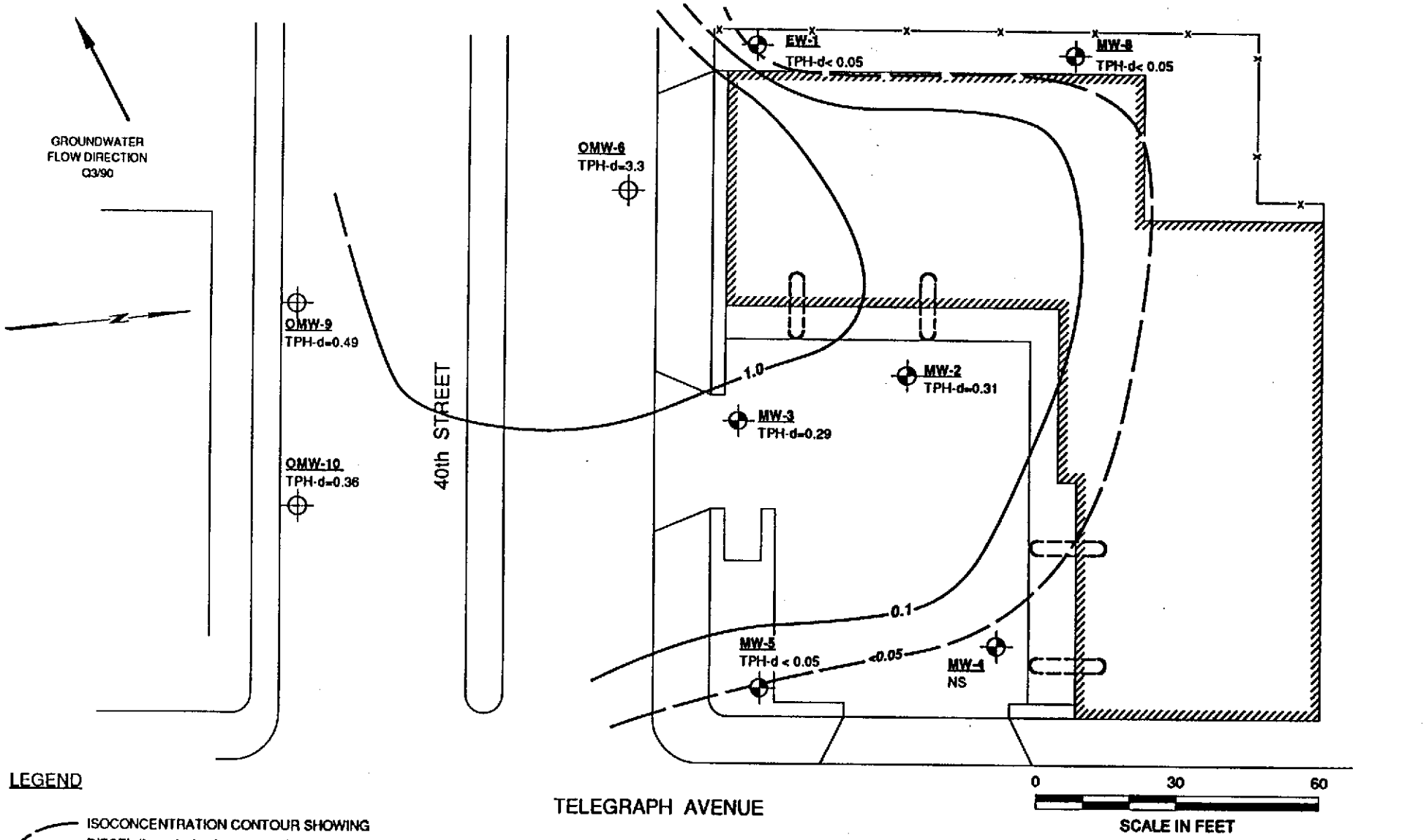
- ISOCONCENTRATION CONTOUR SHOWING GASOLINE (long dash where approximate, short dash where inferred)
- MW-1 — GROUNDWATER MONITORING WELL
- OMW-6 — OFFSITE GROUNDWATER MONITORING WELL
- TPH-g = TOTAL PETROLEUM HYDROCARBONS AS GASOLINE (in milligrams per liter)

PLAN: GROUNDWATER TPH-g Q3/90

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Project No.	88-44-361-20
Prepared by	CCH/CRB
Date	9/21/90
Checked by	CCH
Drawing No.	6
Approved by	BG



LEGEND

- ISOCONCENTRATION CONTOUR SHOWING DIESEL (long dash where approximate, short dash where inferred)
- MW-1 — GROUNDWATER MONITORING WELL
- OMW-6 — OFFSITE GROUNDWATER MONITORING WELL
- TPH-d = TOTAL PETROLEUM HYDROCARBONS AS DIESEL (in milligrams per liter)

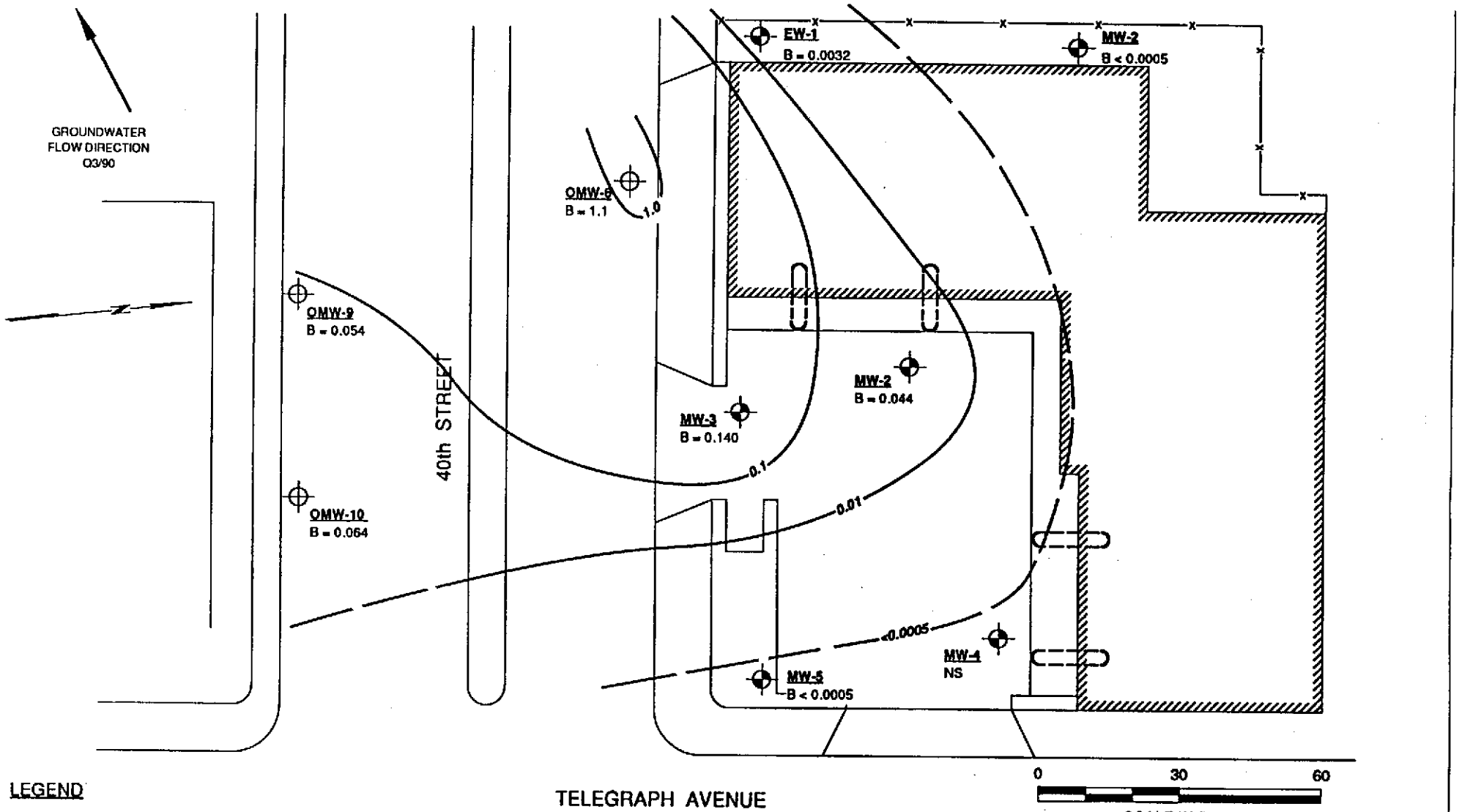
Base Map: Surveyed with Electronic Distance Meter by CEW, 1989

PLAN: GROUNDWATER TPH-d Q3/90

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Project No.	88-44-361-20
Prepared by	CCH/CRB
Date	9/21/90
Checked by	CCH
Drawing No.	7
Approved by	BG



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

LEGEND

- ISOCONCENTRATION CONTOUR SHOWING BENZENE (long dash where approximate, short dash where inferred)
- MW-1 — GROUNDWATER MONITORING WELL
- OMW-6 — OFFSITE GROUNDWATER MONITORING WELL
- B = BENZENE (milligrams per liter)

PLAN: GROUNDWATER BENZENE Q3/90

SHELL OIL COMPANY
500 40th Street
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Project No.	88-44-361-20
Prepared by	CCH/CRB
Date	9/21/90
Checked by	CCH
Drawing No.	8
Approved by	BG

APPENDIX A

SITE DESCRIPTION

APPENDIX A

SITE DESCRIPTION

LOCATION

The Shell Oil Company (Shell) site is located at 500 40th Street in Oakland, California. The site is approximately 145 feet long by approximately 130 feet wide. The site was formerly operated as a retail motor vehicle fuel sales and automobile repair station. Presently, it is occupied by several non-industrial retail sales and services.

SETTING

The facility is located on the gently sloped alluvial fan between the base of the Oakland Hills to the east and the San Francisco Bay to the west. The major natural soils underlying the site consist of alluvial-fan deposits comprising interfingering lenses of clayey gravel, sandy silty clay and sand-clay-silt mixtures of Pleistocene Age, commonly known as the Temescal formation. A layer of gravel with cobbles is at the base of the formation. The gravel often grades upward into sand and then into clay. In general, the formation is thin near the Bay and thicker close to the Oakland Hills.

Underlying the Temescal Formation is the oldest of the post-Knoxville quaternary unconsolidated deposits, known as the Alameda Formation, formed during the Pleistocene Age. In its upper part it consists mainly of yellowish-gray to yellowish-brown sandy, silty clay containing a few pebbles. The lower part, consisting of clay, silt, sand and gravel, does not crop out. The upper clay crops out at the several locations within the area.

Bedrock below the Alameda formation is the Franciscan Complex, of Jurassic and Cretaceous Age. It consists of fine to very coarse-grained sandstone with some shale beds.

APPENDIX B

CHRONOLOGICAL SUMMARY

CHRONOLOGICAL SUMMARY

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

Date	Description of Activity
7/82	IT installed 8 six inch diameter groundwater monitoring wells to 30 feet below ground surface (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.
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 tops of casings (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.

CHRONOLOGICAL SUMMARY (continued)

Date	Description of Activity
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 westward-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.
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.

CHRONOLOGICAL SUMMARY (continued)

Date	Description of Activity
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.
1/04/87(?)	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.
1/89	Shell transfers project to CEW.
4/07/89	Revised Work Plan submitted to RWQCB.
5/23/89	Monitoring wells MW-2, MW-3 and MW-4 installed, soil sampled.
6/20/89	Groundwater sampled, wells MW-2 through MW-4.
7/07/89	CEW issued Quarterly Report.
7/19/89	Groundwater sampled, wells MW-2 through MW-4.
8/01/89	Right-of-Entry Agreement sent to property owners of 518 40th Street.
8/08/89	Groundwater was sampled, wells MW-2 through MW-4.
9/11/89	Groundwater was sampled, wells MW-2 through MW-4.
9/19/89	CEW installed well MW-5; soils were sampled and analyzed.
10/10/89	Groundwater was sampled MW-2 through MW-5.
10/16/89	CEW installed well OMW-6; soils were sampled and analyzed.
10/17/89	CEW installed boring SB-1; soils sampled and analyzed; and bored OMW-9. During well drilling, Loma Prieta Earthquake struck. Oakland municipal services were severely disrupted.

CHRONOLOGICAL SUMMARY (continued)

Date	Description of Activity
10/21/89	OMW-9 pilot boring was sealed.
11/13/89	OMW-9 boring was reamed and the well installed. OMW-10 installed; soils sampled and analyzed. Proposed well OMW-8 boring attempted and abandoned; location was in sewer main backfill.
11/17/89	Discharge permit application for interim groundwater treatment system submitted to EBMUD.
12/01/89	OMW-6 was developed.
12/10/89	OMW-10 and OMW-9 were developed.
1/5/90	CEW sampled groundwater wells MW-2, MW-3, MW-4, MW-5, OMW-6, OMW-9 and OMW-10.
8/89-3/90	Ongoing unsuccessful attempts to gain right-of-entry for installation of extraction wells EW-11 and EW-12, as the commencement of onsite groundwater remediation. This process has continued without resolution since August, 1989.
2/15-20/90	Conducted underground utilities location survey in the west alley behind the building; survey was needed for the proposed groundwater monitoring well location selection.
3/2-3/4/90	CEW sampled groundwater wells MW-2, MW-3, MW-4, MW-5, OMW-6, OMW-9 and OMW-10.
3/22/90	Shell obtained the right-of-entry agreement from the owners of 518 40th Street.
5/31-6/1/90	CEW sampled groundwater wells MW-2, MW-3, MW-4, MW-5 OMW-6, OMW-9 and OMW-10.
6/27-28/90	CEW installed onsite wells MW-8 and EW-1.
7/03/90	CEW sampled groundwater from wells MW-8 and EW-1.
8/28-29/90	CEW sampled groundwater monitoring wells MW-2 through MW-5, OMW-6, OMW-9 and OMW-10.

NOTE:

Bold indicates work completed this quarter.

APPENDIX C

ANALYTICAL LABORATORY REPORTS AND CHAIN-OF-CUSTODY FORMS

NATIONAL ENVIRONMENTAL TESTING, INC.

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

RECEIVED

JUL 17 1990

CONVERSE ENVIRONMENTAL

Bojan Gustincic
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

Date: 07-16-90
NET Client Acct No: 18.02
NET Pacific Log No: 2680
Received: 06-29-90 0800

Client Reference Information

500 40th/Telegraph; Project: 88-44-361-20

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 II
Laboratory Manager

JS:rct
Enclosure(s)

Client No: 18.02 Date: 07-16-90
Client Name: Converse Consultants
NET Log No: 2680 Page: 2

Ref: 500 40th/Telegraph; Project: 88-44-361-20

			Descriptor, Lab No. and Results		
			MW-8 6' 06-27-90	MW-8 10' 06-27-90	
Parameter	Method	Reporting Limit	56791	56792	Units
Lead (EPA 7421)	7421	0.2	5.4	5.4	mg/Kg
PETROLEUM HYDROCARBONS			--	--	
VOLATILE (SOIL)			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			07-02-90	07-02-90	
METHOD GC FID/5030			--	--	
as Gasoline		1	ND	ND	mg/Kg
METHOD 8020			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			07-02-90	07-02-90	
Benzene		2.5	ND	ND	ug/Kg
Ethylbenzene		2.5	ND	ND	ug/Kg
Toluene		2.5	ND	ND	ug/Kg
Xylenes, total		2.5	ND	ND	ug/Kg
PETROLEUM HYDROCARBONS			--	--	
EXTRACTABLE (SOIL)			--	--	
DILUTION FACTOR *			1	1	
DATE EXTRACTED			07-06-90	07-06-90	
DATE ANALYZED			07-07-90	07-07-90	
METHOD GC FID/3550			--	--	
as Diesel		1	ND	ND	mg/Kg
as Motor Oil		10	ND	ND	mg/Kg

Client No: 18.02 Date: 07-16-90
Client Name: Converse Consultants
NET Log No: 2680 Page: 3

Ref: 500 40th/Telegraph; Project: 88-44-361-20

			Descriptor, Lab No. and Results		
			MW-8 15' 06-27-90	MW-8 20' 06-27-90	
Parameter	Method	Reporting Limit	56793	56794	Units
Lead (EPA 7421)	7421	0.2	4.4	5.8	mg/Kg
PETROLEUM HYDROCARBONS			--	--	
VOLATILE (SOIL)			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			07-02-90	07-02-90	
METHOD GC FID/5030			--	--	
as Gasoline		1	ND	ND	mg/Kg
METHOD 8020			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			07-02-90	07-02-90	
Benzene		2.5	ND	ND	ug/Kg
Ethylbenzene		2.5	ND	ND	ug/Kg
Toluene		2.5	2.7	ND	ug/Kg
Xylenes, total		2.5	ND	ND	ug/Kg
PETROLEUM HYDROCARBONS			--	--	
EXTRACTABLE (SOIL)			--	--	
DILUTION FACTOR *			1	1	
DATE EXTRACTED			07-06-90	07-06-90	
DATE ANALYZED			07-07-90	07-07-90	
METHOD GC FID/3550			--	--	
as Diesel		1	ND	ND	mg/Kg
as Motor Oil		10	ND	ND	mg/Kg

Ref: 500 40th/Telegraph; Project: 88-44-361-20

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Diesel	1	mg/Kg	102	ND	97	92	5.3
Motor Oil	10	mg/Kg	99	ND	NA	NA	NA

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	1	mg/Kg	99	ND	95	82	14
Benzene	2.5	ug/Kg	86	ND	92	81	13
Toluene	2.5	ug/Kg	88	ND	97	89	8.6

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
Lead (EPA 7421)	0.2	mg/Kg	94	ND	112	116	3.5

COMMENT: Blank Results were ND on other analytes tested.

KEY TO ABBREVIATIONS and METHOD REFERENCES

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

Method References

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

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

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

NATIONAL ENVIRONMENTAL TESTING, INC.

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Fax: (707) 526-9623

Bojan Gustincic
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

Date: 09-17-90
NET Client Acct No: 18.02
NET Pacific Log No: 3598
Received: 08-31-90 0800

Client Reference Information

SHELL, 500 40th Street/Telegraph; Project: 88-44-361-20

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

JS:rct
Enclosure(s)

Client No: 18.02 Date: 09-17-90
Client Name: Converse Consultants
NET Log No: 3598 Page: 2

Ref: SHELL, 500 40th Street/Telegraph; Project: 88-44-361-20

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results OMW-10 08-29-90 1340 61682	 OMW-9 08-29-90 1400 61683	Units
PETROLEUM HYDROCARBONS			--	--	
VOLATILE (WATER)			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			09-06-90	09-06-90	
METHOD GC FID/5030			--	--	
as Gasoline		0.05	0.36	2.1	mg/L
METHOD 602			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			09-06-90	09-06-90	
Benzene		0.5	64	54	ug/L
Ethylbenzene		0.5	2.2	11	ug/L
Toluene		0.5	0.6	7.5	ug/L
Xylenes, total		0.5	5.7	120	ug/L
PETROLEUM HYDROCARBONS			--	--	
EXTRACTABLE (WATER)			--	--	
DILUTION FACTOR *			1	1	
DATE EXTRACTED			09-04-90	09-04-90	
DATE ANALYZED			09-04-90	09-04-90	
METHOD GC FID/3510			--	--	
as Diesel		0.05	0.36	0.49	mg/L
as Motor Oil		0.5	1.1	ND	mg/L

Ref: SHELL, 500 40th Street/Telegraph; Project: 88-44-361-20

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Gasoline	0.05	mg/L	97	ND	86	89	3.3
Benzene	0.5	ug/L	95	ND	90	93	3.8
Toluene	0.5	ug/L	95	ND	91	95	4.3
COMMENT: Blank Results were ND on other analytes tested.							
Diesel	0.05	mg/L	107	ND	75	88	16
Motor Oil	0.5	mg/L	90	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, which supercedes the listed reporting limit.
mean	:	Average; sum of measurements divided by number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
N/A	:	Not applicable.
NA	:	Not analyzed.
ND	:	Not detected; the analyte concentration is less than applicable listed reporting limit.
NTU	:	Nephelometric turbidity units.
RPD	:	Relative percent difference, 100 [Value 1 - Value 2]/mean value.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
umhos/cm	:	Micromhos per centimeter.

Method References

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

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

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

WIC #: -204-3500-4103
AFE # - 086610
EXP CODE - 5440

3598

PM: Bo G.

CONVERSE ENVIRONMENTAL WEST

CHAIN OF CUSTODY RECORD

PROJECT NO.: 88-44-361-20

SAMPLERS: (Signature) Michelle Mason

PROJECT NAME / CROSS STREET: SHELL 500 40th ST. @ TELEGRAPH

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	ANALYSES: TPH-G	BTEX	TPH-D				REMARKS
OMW-10	8/29/90	1:40 PM		X	40 mL VOA	3.	X	X					STANDARD TURNAROUND TIME
OMW-10	8/29/90	1:40 PM		X	1-Litre Amber	2.			X				
OMW-9	8/29/90	2:00 PM		X	40 mL VOA	3.	X	X					
OMW-9	8/29/90	2:00 PM		X	1-Litre Amber	2.			X				

Detection Limits:

TPH-G = 0.05 ppm
TPH-D = 0.05 ppm
BTEX = 0.0005 ppm

RELINQUISHED BY: (Signature) Michelle Mason	DATE: 8/30/90 TIME: 6:00 p	RECEIVED BY: (Signature) James Green	RELINQUISHED BY: (Signature) James Green	DATE: 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 (VIA NCL)		SHIPPED BY: (Signature)	RECEIVED FOR LAB: (Signature) K Temple	DATE: 8-31-90 TIME: 0800	COURIER FROM AIRPORT: (Signature)

NATIONAL ENVIRONMENTAL TESTING, INC.

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435 Tesconi Circle
Santa Rosa, CA 95401
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Fax: (707) 526-9623

Bo Gustincic
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

Date: 07-17-90
NET Client Acct No: 18.02
NET Pacific Log No: 2718
Received: 06-29-90 2300

Client Reference Information

SHELL, 500 40th/Telegraph; Project: 88-44-361-20

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:

Judy Redlesfox

Jules Skamarack
Laboratory Manager

JS:rct
Enclosure(s)

Client No: 18.02 Date: 07-17-90
Client Name: Converse Consultants
NET Log No: 2718 Page: 2

Ref: SHELL, 500 40th/Telegraph; Project: 88-44-361-20

			Descriptor, Lab No. and Results		
			EW-1 6' 06-28-90	EW-1 10' 06-28-90	
Parameter	Method	Reporting Limit	56834	56835	Units
Lead (EPA 7421)	7421	0.2	9.1	3.3	mg/Kg
PETROLEUM HYDROCARBONS			--	--	
VOLATILE (SOIL)			--	--	
DILUTION FACTOR *			1	10	
DATE ANALYZED			07-03-90	07-05-90	
METHOD GC FID/5030			--	--	
as Gasoline		1	ND	110	mg/Kg
METHOD 8020			--	--	
DILUTION FACTOR *			1	10	
DATE ANALYZED			07-03-90	07-05-90	
Benzene		2.5	ND	28	ug/Kg
Ethylbenzene		2.5	ND	410	ug/Kg
Toluene		2.5	ND	380	ug/Kg
Xylenes, total		2.5	8.1	1,600	ug/Kg
PETROLEUM HYDROCARBONS			--	--	
EXTRACTABLE (SOIL)			--	--	
DILUTION FACTOR *			1	1	
DATE EXTRACTED			07-06-90	07-06-90	
DATE ANALYZED			07-07-90	07-07-90	
METHOD GC FID/3550			--	--	
as Diesel		1	ND	4.4	mg/Kg
as Motor Oil		10	21	ND	mg/Kg

Client No: 18.02 Date: 07-17-90
Client Name: Converse Consultants
NET Log No: 2718 Page: 3

Ref: SHELL, 500 40th/Telegraph; Project: 88-44-361-20

			Descriptor, Lab No. and Results		
			EW-1 15' 06-28-90	EW-1 20' 06-28-90	
Parameter	Method	Reporting Limit	56836	56837	Units
Lead (EPA 7421)	7421	0.2	3.0	4.8	mg/Kg
PETROLEUM HYDROCARBONS			--	--	
VOLATILE (SOIL)			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			07-03-90	07-03-90	
METHOD GC FID/5030			--	--	
as Gasoline		1	ND	ND	mg/Kg
METHOD 8020			--	--	
DILUTION FACTOR *			1	1	
DATE ANALYZED			07-03-90	07-03-90	
Benzene		2.5	ND	ND	ug/Kg
Ethylbenzene		2.5	ND	ND	ug/Kg
Toluene		2.5	5.0	ND	ug/Kg
Xylenes, total		2.5	2.9	ND	ug/Kg
PETROLEUM HYDROCARBONS			--	--	
EXTRACTABLE (SOIL)			--	--	
DILUTION FACTOR *			1	1	
DATE EXTRACTED			07-06-90	07-06-90	
DATE ANALYZED			07-07-90	07-07-90	
METHOD GC FID/3550			--	--	
as Diesel		1	ND	ND	mg/Kg
as Motor Oil		10	ND	ND	mg/Kg

Ref: SHELL, 500 40th/Telegraph; Project: 88-44-361-20

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Diesel	1	mg/Kg	102	ND	97	92	5.3
Motor Oil	10	mg/Kg	99	ND	NA	NA	NA

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Diesel	1	mg/Kg	100	ND	84	90	6.9
Motor Oil	10	mg/Kg	137	ND	NA	NA	NA

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Gasoline	1	mg/Kg	120	ND	100	90	10
Benzene	2.5	ug/Kg	89	ND	102	94	8.2
Toluene	2.5	ug/Kg	91	ND	100	96	4.1

COMMENT: Blank Results were ND on other analytes tested.

KEY TO ABBREVIATIONS and METHOD REFERENCES

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

Method References

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

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

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

CONVERSE ENVIRONMENTAL WEST

CHAIN OF CUSTODY RECORD

2718

PROJECT NO.:	PROJECT NAME / CROSS STREET :
88-44-361-20	500 40th / TELEGRAPH
SAMPLERS: (Signature)	

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	ANALYSES: TPH-g	TPH-d	BTEX	LEAD			REMARKS
EW-1	6/29/90			✓	EW-1 @ 6 ft	1	X	X	X	Y			LOC - 204-5508-4F03 AFE - 986611 EX - 5440 SHELL - STAT
"	"			✓	" @ 10 ft	1	X	X	X	Y			
"	"			✓	" @ 15 ft	1	X	X	X	Y			
"	"			✓	" @ 20 ft	1	X	X	X	Y			
"	"			✓	" @ 25 ft	1	X	X	X	X			HOLD - SATURATED
2													
													custody seal intact 6/29/90
													custody seal 6/29/90 @ 19:00

RELINQUISHED BY : (Signature)	DATE : 6/29/90	RECEIVED BY : (Signartue)	RELINQUISHED BY : (Signature)	DATE : 6/29/90	RECEIVED BY : (Signature)
	TIME : 17:00			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 : (Signature)	DATE :	RECEIVED BY COURIER : (Signature)
	TIME :			TIME :	
METHOD OF SHIPMENT: (WITH NCS)		SHIPPED BY : (Signatue)	RECEIVED FOR LAB : (Signature)	DATE : 6-29-90	COURIER FROM AIRPORT : (Signature)
				TIME : 2300	

NET NATIONAL ENVIRONMENTAL TESTING, INC.

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

Bo Gustincic
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

Date: 07-19-90
NET Client Acct No: 18.02
NET Pacific Log No: 2768
Received: 07-06-90 0800

Client Reference Information

SHELL, 500 40th Street/Telegraph Rd.; Project: 88-44-361-20

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

JS:rct
Enclosure(s)

Client No: 18.02
Client Name: Converse Consultants
NET Log No: 2768

Date: 07-19-90

Ref: SHELL, 500 40th Street/Telegraph Rd.; Project: 88-44-361-20

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results 900703 07-03-90 1330 57254	 MW-8 07-03-90 1430 57255	Units
PETROLEUM HYDROCARBONS VOLATILE (WATER)			--	--	
DILUTION FACTOR *			--	--	
DATE ANALYZED			1	1	
METHOD GC FID/5030			07-10-90	07-10-90	
as Gasoline		0.05	--	--	
METHOD 602			ND	0.16	mg/L
DILUTION FACTOR *			--	--	
DATE ANALYZED			1	1	
Benzene		0.5	07-10-90	07-10-90	
Ethylbenzene		0.5	ND	ND	ug/L
Toluene		0.5	ND	ND	ug/L
Xylenes, total		0.5	ND	ND	ug/L
PETROLEUM HYDROCARBONS EXTRACTABLE (WATER)			ND	ND	ug/L
DILUTION FACTOR *			--	--	
DATE EXTRACTED			--	--	
DATE ANALYZED			1	1	
METHOD GC FID/3510			07-09-90	07-09-90	
as Diesel		0.3	07-09-90	07-09-90	
as Motor Oil		0.5	--	--	
			ND	ND	mg/L
			ND	ND	mg/L

Client No: 18.02
Client Name: Converse Consultants
NET Log No: 2768

Date: 07-19-90

Ref: SHELL, 500 40th Street/Telegraph Rd.; Project: 88-44-361-20

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results: EW-1 07-03-90 1450 57256	trip blank 06-25-90 57257	Units
PETROLEUM HYDROCARBONS VOLATILE (WATER)			--	--	
DILUTION FACTOR *			--	--	
DATE ANALYZED			1	1	
METHOD GC FID/5030			07-10-90	07-11-90	
as Gasoline		0.05	--	--	
METHOD 602			0.40	ND	mg/L
DILUTION FACTOR *			--	--	
DATE ANALYZED			1	1	
Benzene		0.5	07-10-90	07-11-90	
Ethylbenzene		0.5	3.2	ND	ug/L
Toluene		0.5	0.7	ND	ug/L
Xylenes, total		0.5	0.9	ND	ug/L
PETROLEUM HYDROCARBONS EXTRACTABLE (WATER)			4.0	ND	ug/L
DILUTION FACTOR *			--	--	
DATE EXTRACTED			--	--	
DATE ANALYZED			1	1	
METHOD GC FID/3510			07-09-90	07-09-90	
as Diesel		0.3	07-09-90	07-09-90	
as Motor Oil		0.5	--	--	
			ND	ND	mg/L
			ND	ND	mg/L

Client No: 18.02
Client Name: Converse Consultants
NET Log No: 2768

Date: 07-19-90

Ref: SHELL, 500 40th Street/Telegraph Rd.; Project: 88-44-361-20

Parameter	Method	Reporting Limit	Descriptor, Lab No. and Results field blank 07-03-90 1440 57258	Units
PETROLEUM HYDROCARBONS VOLATILE (WATER)			--	
DILUTION FACTOR *			--	
DATE ANALYZED			1	
METHOD GC FID/5030			07-11-90	
as Gasoline		0.05	--	
METHOD 602			ND	mg/L
DILUTION FACTOR *			--	
DATE ANALYZED			1	
Benzene		0.5	07-11-90	
Ethylbenzene		0.5	ND	ug/L
Toluene		0.5	ND	ug/L
Xylenes, total		0.5	ND	ug/L
PETROLEUM HYDROCARBONS EXTRACTABLE (WATER)			ND	ug/L
DILUTION FACTOR *			--	
DATE EXTRACTED			--	
DATE ANALYZED			1	
METHOD GC FID/3510			07-09-90	
as Diesel		0.3	07-09-90	
as Motor Oil		0.5	--	
			ND	mg/L
			ND	mg/L

Ref: SHELL, 500 40th Street/Telegraph Rd.; Project: 88-44-361-20

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Gasoline	0.05	mg/L	101	ND	100	102	1.9
Benzene	0.5	ug/L	101	ND	100	97	3.2
Toluene	0.5	ug/L	100	ND	100	97	2.6

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	0.3	mg/L	101	ND	N/A	N/A	N/A
Motor Oil	0.5	mg/L	103	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, which supercedes the listed reporting limit.
mean	:	Average; sum of measurements divided by number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
N/A	:	Not applicable.
NA	:	Not analyzed.
ND	:	Not detected; the analyte concentration is less than applicable listed reporting limit.
NTU	:	Nephelometric turbidity units.
RPD	:	Relative percent difference, 100 [Value 1 - Value 2]/mean value.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
umhos/cm	:	Micromhos per centimeter.

Method References

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

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

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

WIC # 204-5508-4403
AFE # 986611
EXPCODE 5440

CONVERSE ENVIRONMENTAL WEST

CHAIN OF CUSTODY RECORD

P.M. Bo G. (2768)

PROJECT NO.: 88-44-361-20

PROJECT NAME / CROSS STREET: SHELL 500 @ 40th Street, Telegraph Rd.

SAMPLERS: (Signature) Michelle Mason

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	ANALYSES: TPH-G	BTEX	TPH-D	REMARKS
900703	7/03/90	1:30 PM		X	40 mL VOA	3.	X	X		STANDARD TURN-AROUND TIME
900703	7/3/90	1:30 PM		X	1-Litre Amber	2.			X	
MW-8	7/3/90	2:30 PM		X	40 mL VOA	4.	X	X		
MW-8	7/3/90	2:30 PM		X	1-Litre Amber	3.			X	
EW-1	7/3/90	2:50 PM		X	40 mL VOA	3.	X	X		
EW-1	7/3/90	2:50 PM		X	1-Litre Amber	2.			X	
TRIP BLANK	6/25/90				40 mL VOA	1.	X	X		
TRIP BLANK	6/25/90				1-Litre Amber	1.			X	
FIELD BLANK	7/3/90	2:40 PM			40 mL VOA	1.	X	X		
FIELD BLANK	7/3/90	2:40 PM			1-Litre Amber	1.			X	

*CUSTODY SEAL APPLIED 7/5/90 6:30p. custody seal intact @ 9/6

RELINQUISHED BY: (Signature) Michelle Mason	DATE: 7/5/90 TIME: 2:45p	RECEIVED BY: (Signature) James Green	RELINQUISHED BY: (Signature) James Green	DATE: 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 (VIA NCSI)		SHIPPED BY: (Signature)	RECEIVED FOR LAB: (Signature) K Temple	DATE: 7-6-90 TIME: 0830	COURIER FROM AIRPORT: (Signature)		

NET NATIONAL ENVIRONMENTAL TESTING, INC.

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

Bo Gustincic
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

Date: 07-19-90
NET Client Acct No: 18.02
NET Pacific Log No: 2797
Received: 07-09-90 1700

Client Reference Information

SHELL, 500 40th/Telegraph; Project: 88-44-361-20

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)

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 2797

Date: 07-19-90
Page: 2

Ref: SHELL, 500 40th/Telegraph; Project: 88-44-361-20

ANALYTE: Lead (EPA 7421) WET-Sol
REPORTING LIMIT: 0.002 mg/L

Lab No.	Descriptor		Results	Units
57363	MW-8 6'	06-27-90	0.057	mg/L
57364	MW-8 10'	06-27-90	0.037	mg/L
57365	MW-8 20'	06-27-90	0.035	mg/L

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 2797

Date: 07-19-90
Page: 3

Ref: SHELL, 500 40th/Telegraph; Project: 88-44-361-20

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Lead (EPA 7421)	0.002	mg/L	109	ND	96	96	<1

KEY TO ABBREVIATIONS and METHOD REFERENCES

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

Method References

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

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

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

NATIONAL ENVIRONMENTAL TESTING, INC.

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

Bojan Gustincic
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

Date: 09-10-90
NET Client Acct No: 18.02
NET Pacific Log No: 3578
Received: 08-30-90 0800

Client Reference Information

SHELL, 500 40th Street/Telegraph; Project: 88-44-361-20

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)

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 3578

Date: 09-10-90
Page: 2

Ref: SHELL, 500 40th Street/Telegraph; Project: 88-44-361-20

		Descriptor, Lab No. and Results			
		MW-5 08-28-90 1250	MW-2 08-28-90 1310	MW-3 08-28-90 1340	
Parameter	Reporting Limit	61546	61547	61548	Units
PETROLEUM HYDROCARBONS		--	--	--	
VOLATILE (WATER)		--	--	--	
DILUTION FACTOR *		1	1	10	
DATE ANALYZED		09-04-90	09-04-90	09-06-90	
METHOD GC FID/5030		--	--	--	
as Gasoline	0.05	ND	1.4	1.5	mg/L
METHOD 602		--	--	--	
DILUTION FACTOR *		1	1	10	
DATE ANALYZED		09-04-90	09-04-90	09-06-90	
Benzene	0.5	ND	44	140	ug/L
Ethylbenzene	0.5	ND	2.9	38	ug/L
Toluene	0.5	ND	ND	50	ug/L
Xylenes, total	0.5	ND	67	170	ug/L
PETROLEUM HYDROCARBONS		--	--	--	
EXTRACTABLE (WATER)		--	--	--	
DILUTION FACTOR *		1	1	1	
DATE EXTRACTED		09-04-90	09-04-90	09-04-90	
DATE ANALYZED		09-04-90	09-04-90	09-04-90	
METHOD GC FID/3510		--	--	--	
as Diesel	0.05	ND	0.31	0.29	mg/L
as Motor Oil	0.5	ND	ND	ND	mg/L

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 3578

Date: 09-10-90
Page: 3

Ref: SHELL, 500 40th Street/Telegraph; Project: 88-44-361-20

Parameter	Reporting Limit	Descriptor, Lab No. and Results 900828 08-28-90 1350 61549	 OMW-6 08-28-90 1450 61550	 field blank 08-28-90 1430 61551	Units
PETROLEUM HYDROCARBONS		--	--	--	
VOLATILE (WATER)		--	--	--	
DILUTION FACTOR *		10	25	1	
DATE ANALYZED		09-06-90	09-06-90	09-04-90	
METHOD GC FID/5030		--	--	--	
as Gasoline	0.05	1.5	16	ND	mg/L
METHOD 602		--	--	--	
DILUTION FACTOR *		10	25	1	
DATE ANALYZED		09-06-90	09-06-90	09-04-90	
Benzene	0.5	140	1,100	ND	ug/L
Ethylbenzene	0.5	36	220	ND	ug/L
Toluene	0.5	49	580	1.3	ug/L
Xylenes, total	0.5	170	1,400	ND	ug/L
PETROLEUM HYDROCARBONS		--	--	--	
EXTRACTABLE (WATER)		--	--	--	
DILUTION FACTOR *		1	10	1	
DATE EXTRACTED		09-04-90	09-04-90	09-04-90	
DATE ANALYZED		09-04-90	09-04-90	09-04-90	
METHOD GC FID/3510		--	--	--	
as Diesel	0.05	0.26	3.3	ND	mg/L
as Motor Oil	0.5	ND	ND	ND	mg/L

Ref: SHELL, 500 40th Street/Telegraph; Project: 88-44-361-20

Parameter	Reporting Limit	Descriptor, Lab No. and Results trip blank 08-20-90 61552	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		09-06-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		09-06-90	
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		09-04-90	
DATE ANALYZED		09-04-90	
METHOD GC FID/3510		--	
as Diesel	0.05	ND	mg/L
as Motor Oil	0.5	ND	mg/L

Ref: SHELL, 500 40th Street/Telegraph; Project: 88-44-361-20

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Diesel	0.05	mg/L	107	ND	75	88	16
Motor Oil	0.5	mg/L	90	ND	N/A	N/A	N/A

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Gasoline	0.05	mg/L	88	ND	87	94	7.5
Benzene	0.5	ug/L	89	ND	96	104	7.4
Toluene	0.5	ug/L	91	ND	102	109	7.1

COMMENT: Blank Results were ND on other analytes tested.

KEY TO ABBREVIATIONS and METHOD REFERENCES

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

Method References

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

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

CONVERSE ENVIRONMENTAL **WEST** 3578

CHAIN OF CUSTODY RECORD

WC# 20[illegible]
AFE# 086610
EXP CODE # 5440

PM: Bo G.

PROJECT NO.: 88-44-361-20
PROJECT NAME / CROSS STREET: SHELL 500 40th St. @ TELEGRAPH
SAMPLERS: (Signature) Michelle Moore

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	ANALYSES: TPH-G	BTEX	TPH-D	REMARKS
MW-5	8/28/90	12:50 PM		X	40 mL VOA's	3	X	X		STANDARD TURNAROUND TIME
MW-5	8/28/90	12:50 PM		X	1-Litre Amber	2			X	
MW-2	8/28/90	1:10 PM		X	40 mL VOA's	4	X	X		Detection Limits:
MW-2	8/28/90	1:10 PM		X	1-Litre Amber	3			X	
MW-3	8/28/90	1:40 PM		X	40 mL VOA's	3	X	X		TPH-G; 0.05 ppm
MW-3	8/28/90	1:40 PM		X	1-Litre Amber	2			X	BTEX : 0.0005 ppm
900828	8/28/90	1:50 PM		X	40 mL VOA's	3	X	X		TPH-D : 0.05 ppm
900828	8/28/90	1:50 PM		X	1-Litre Amber	2			X	
OMW-6	8/28/90	14:50 PM		X	40 mL VOA's	3	X	X		
OMW-6	8/28/90	14:50 PM		X	1-Litre Amber	2			X	
TRIP BLANK	8/20/90				40 mL VOA's	1	X	X		
TRIP BLANK	8/20/90				1-Litre Amber	1			X	
FIELD BLANKS	8/28/90	2:30 2:30			40 mL VOA -Litre Amber	1 1	X	X	X	

INTACT @ 8/30/90
custody seal 8/29/90 @ 19:00

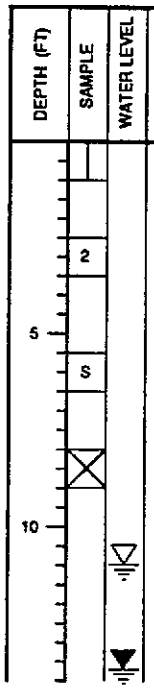
RELINQUISHED BY : (Signature)	DATE : 8/29/90 TIME : 15:50	RECEIVED BY : (Signartue)	RELINQUISHED BY : (Signature)	DATE : 8/29/90 TIME :	RECEIVED BY : (Signature)
RELINQUISHED BY : (Signature)	DATE : TIME :	RECEIVED BY : (Signartue)	RELINQUISHED BY : (Signature)	DATE : TIME :	RECEIVED BY : (Signature)
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 8/30/90 TIME 0800	COURIER FROM AIRPORT : (Signature)

APPENDIX D

BORING LOGS

MAJOR DIVISIONS			SYMBOLS	TYPICAL NAMES
COARSE GRAINED SOILS MORE THAN HALF IS LARGER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12 % FINES	GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS
			SP	POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12 % FINES	SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE GRAINED SOILS MORE THAN HALF IS SMALLER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR,SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAY
			OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE, SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS

SAMPLE TYPE



INTERVAL SAMPLED WITH HAND AUGER

DRIVEN SAMPLE, 2.5" I.D. SAMPLER, DRIVEN WITH 140 LB. WEIGHT, 30" DROP

DRIVE SAMPLE, USED FOR LITHOLOGIC LOGGING ONLY

NO RECOVERY

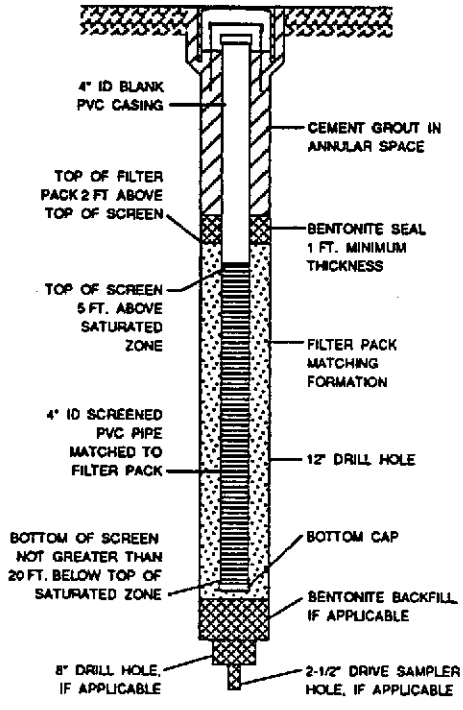
INITIAL WATER LEVEL AT TIME OF DRILLING

STABILIZED WATER LEVEL ON DATE NOTED

NOTE:

SOIL CONDITIONS INDICATED BY BORING LOGS APPLY ONLY AT THE LOCATION OF THE PARTICULAR BORING AND AT THE TIME OF DRILLING. SUBSURFACE CONDITIONS MAY DIFFER AT OTHER LOCATIONS AND MAY CHANGE AT THE BORING LOCATION WITH THE PASSAGE OF TIME. DATA PRESENTED IN THE LOGS REPRESENT A SIMPLIFICATION OF THE ACTUAL CONDITIONS ENCOUNTERED.

WELL CONSTRUCTION



UNIFIED SOIL CLASSIFICATION, BORING LOG, AND WELL CONSTRUCTION SYMBOLS

SHELL OIL COMPANY
500 40th Street
Oakland, California

Project No.
88-44-361-20

Drawing No.
A-1

Converse Environmental West

LOG OF BORING NO. EW-1

DATE DRILLED: 6/28/90	EL: n/a	WL TAKEN: n/a	EQUIPMENT: 3.75"x 8" / 7.25"x 12" H.S.A

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	CONSISTENCY	COLOR	DESCRIPTION		WELL CONSTRUCTION	BLOWS/6IN.	O.V.H. (ppm)	T.P.H. (ppm)
				moist	loose	light brown	0.2' CONCRETE. Pea GRAVEL. (Fill)					
				moist	medium	black	Silty CLAY, trace Gravel.	CL				
5	1					dark gray	Gravelly CLAY.	CL		5		
				moist	medium dense	tan	Fine SAND.	SP		6		
	S				loose	tan	Fine SAND.	SP		2 2 3		
				slightly moist	stiff	dark gray	Silty CLAY.	CL		8 5		
	S			slightly moist	stiff	dark gray	Silty CLAY.	CL		9		
	2						Silty CLAY, some fine Sand.	CL		8		
10				moist	dense		Clayey GRAVEL.	GC		17 15		
	S				medium dense	dark gray	Clayey GRAVEL.	GC		12		
				slightly moist	very stiff	tan	Silty CLAY.	CL		14 16 7		
	S									18 15		
				slightly moist	very stiff	grayish brown	Silty CLAY.	CL		14 15		
	3			slightly moist	very stiff	tan	Silty CLAY, trace Gravel.	CL		11		
15										10 14		
	S									18		
				slightly moist	hard	tan	Silty CLAY, trace Gravel.	CL		20 10		
	S									15 19		
				slightly moist	very stiff	light brown	Silty Clay, tr fine Sand.	CL		21 7		
	4			slightly moist	hard	brown	Silty CLAY.	CL		18		
20												

SHELL OIL COMPANY
500 40th Street
Oakland, California

Project No.
88-44-361-20

Converse Environmental West

Drawing No.
A-5

LOG OF BORING NO. EW-1

continued - page 2

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	CONSISTENCY	COLOR	DESCRIPTION		WELL CONSTRUCTION	BLOWS/6IN.	O.V.M. (ppm)	T.P.H. (ppm)
							Silty CLAY.	CL		7		
	S			slightly moist						19		
					hard	reddish brown	Silty CLAY, trace Gravel.	CL		20		
				moist			Last 2" Clayey Sandy Gravel.			22		
							Sandy GRAVEL, some Silt, trace Clay.	GM		12		
	S									17		
							0.2' Sandy CLAY.			20		
				very moist	dense	reddish brown	Sandy GRAVEL, some Silt.	GM		22		
	S						Gravelly CLAY.	GC		5		
25				wet	medium dense	brown	Sandy GRAVEL, some Clay, some Silt.	GM		11		
	S									12		
							Gravelly SAND, some Silt.	GC		15		
							Increasing Gravel.			17		
				wet	dense	brown	Sandy GRAVEL, some Silt.	GM		18		
										12		
	S									18		
					medium dense		Silty SAND, some Gravel, trace Clay.	SC/GC		20		
				wet		brown				22		
	S			wet			Fine to coarse Sandy Fine to coarse GRAVEL.	GM		15		
30					dense	brown				23		
	S						Increasing Gravel.			15		
					dense	brown				16		
				wet			Sandy GRAVEL.	GP		19		
										24		
	S					brown	Sandy GRAVEL.	GP		17		
					v stiff	brown	Silty CLAY, tr fine Sand.	CL		18		
				wet						20		
	S						Sandy GRAVEL.	GP		23		
				wet			Fine to medium GRAVEL, some Sand, some Clay.	GP		17		
35										22		
	S									22		
				wet		brown				20		
						rusty red	GRAVEL, little SAND.	GP		14		
	S									17		
						rd brn	Silty fine SAND.	SM		16		
				moist			Fine SAND and GRAVEL, some Silt.	GP		22		
					very dense					50/5"		
	S									16		
40				moist	very dense	brown	Silty Sandy GRAVEL.	GM		24		

SHELL OIL COMPANY
500 40th Street
Oakland, California

Project No.
88-44-361-20

Drawing No.
A-6

LOG OF BORING NO. EW-1

continued - page 3

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	CONSISTENCY	COLOR	DESCRIPTION		WELL CONSTRUCTION	BLOWS/6IN.	O.V.M. (ppm)	T.P.H. (ppm)
							Sandy CLAY, some GRAVEL.	CL		12		
	S			moist						13		
						brown				27		
					hard		Sandy CLAY, some GRAVEL.	CL		29		
										6		
	S						Gravelly SAND, some Clay.	SC		23		
										33		
				moist						60		
					very dense	brown						
45												
	S									6		
50				slightly moist	very stiff	tan	Silty CLAY, black organics.	CL		14		
										12		
	S									16		
										19		
				slightly moist	very stiff	tan	Silty CLAY.	CL		22		
										10		
	S									15		
						reddish brown	Silty CLAY.	CL		20		
				slightly moist	hard		Sandy CLAY.	CL		26		
55							Total Depth of Boring: 44 ft Below Ground Surface.					
							Casing: blank 4" ID schedule 40 PVC pipe.					
							Screen: slotted 4" ID schedule 40 PVC pipe. (0.020" slot)					
							Filter Pack: 12/20 Sand.					
60												

SHELL OIL COMPANY
500 40th Street
Oakland, California

Project No.
88-44-361-20

Converse Environmental West

Drawing No.
A-7

LOG OF BORING NO. MW-8

DATE DRILLED: 6/27/90	EL: n/a	WL TAKEN: n/a	EQUIPMENT: 3.75"x 8" / 7.25"x 12" H.S..

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	CONSISTENCY	COLOR	DESCRIPTION		WELL CONSTRUCTION	BLOWS/6IN.	O.V.M. (ppm)	T.P.H. (ppm)
				moist	loose	light brown	Gravelly SAND. (Fill)	SW				
				moist	medium	black	Silty CLAY, trace Gravel.	CL				
5	1			slightly moist	very stiff	brownish gray	Silty CLAY.	CL		7 10		
10	2			slightly moist	very stiff	light gray	Silty CLAY.	CL		6 11		
15	3			moist	very stiff	grayish brown	Silty CLAY, trace coarse Gravel.	CL		5 12		
20	4			very moist	very stiff	reddish brown	Silty CLAY.	CL		12 11		

CERTIFIED ENGINEERING GEOLOGIST
CHARLES R. COMSTOCK
No. 1010
STATE OF CALIFORNIA

SHELL OIL COMPANY
500 40th Street
Oakland, California

Project No.
88-44-361-20

Converse Environmental West

Drawing No.
A-2

LOG OF BORING NO. MW-8

continued - page 2

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	CONSISTENCY	COLOR	DESCRIPTION		WELL CONSTRUCTION	BLOWS/6IN.	O.V.H. (ppm)	T.P.H. (ppm)
	S			wet						10		
										10		
	S			wet	very stiff	light brown	Silty CLAY, trace fine Sand.	CL		20		
										21		
	S			wet	m dense		SAND and CLAY, some Gravel.	SC		10		
							Sandy GRAVEL, some CLAY.	GC		11		
	S			wet	stiff	light brown	Sandy CLAY, trace Gravel.	CL		13		
										14		
	S			wet	medium dense	tan	Sandy fine to coarse GRAVEL, some Clay, some Silt.	GC		10		
25										15		
	S									12		
										15		
										18		
	S			wet	medium dense	tan	Fine to coarse Sandy fine to coarse GRAVEL, trace Clay, trace Silt.	GP		18		
					loose					4		
										8		
	S				medium dense		Sandy GRAVEL.	GP		10		
				wet						12		
	S									30		
30					very dense		Silty SAND and GRAVEL, trace Clay.	GM		27		
	S									8		
										17		
					dense	tan				25		
				wet			Sandy GRAVEL, some Silt, trace Clay.	GM		27		
	S									5		
					loose d=33.75					4		
					medium dense					3		
				wet			Sandy GRAVEL, some Silt.	GM		18		
	S									10		
				wet	dense	tan	Sandy fine to very coarse Gravel, some SILT.	GM		16		
35										15		
	S						Sandy GRAVEL, some Silt.	GM		25		
				wet	dense					13		
				moist		tan	Fine SAND and Silt, some Clay.	SM		14		
	S									8		
										8		
										7		
				moist	stiff	tan	Silty CLAY, tr fine Sand.	CL		14		
						tan	Gravelly SAND, little Clay.	GC		35		
	S			moist	hard	brn gry	Silty CLAY, trace Gravel, trace fine Sand.	CL		32		
40												

SHELL OIL COMPANY
500 40th Street
Oakland, California

Project No.
88-44-361-20

Converse Environmental West

Drawing No.
A-3

LOG OF BORING NO. MW-8

continued - page 3

DEPTH (ft)	SAMPLE	WATER LEVEL	SYMBOL	MOISTURE	CONSISTENCY	COLOR	DESCRIPTION	WELL CONSTRUCTION	BLOWS/6IN.	O.V.M. (ppm)	T.P.H. (ppm)
							Silty CLAY. CL		12		
	S			slightly moist					14		
									18		
				slightly moist	hard	tan	Silty CLAY, trace fine Gravel. CL		21		
									8		
	S								10		
									15		
				slightly moist	very stiff	tan	Silty CLAY, some Sand. CL		17		
45							Total Depth of Boring: 44 ft Below Ground Surface.				
							Casing: blank 4" ID blank schedule 40 PVC Pipe.				
							Screen: slotted 4" ID schedule 40 PVC Pipe. (0.020"slot)				
							Filter Pack: 2/12 Sand.				
50											
55											
60											

CERTIFIED ENGINEERING GEOLOGIST
CHARLES R. COMSTOCK
No. 1010
STATE OF CALIFORNIA

SHELL OIL COMPANY
500 40th Street
Oakland, California

Project No.
88-44-361-20

Converse Environmental West

Drawing No.
A-4

APPENDIX E

COPIES OF FIELD MEASUREMENT RECORDS

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 500 40th St Project No.: 88 44 761 20 Project Manager: BO

Date: 7/2 Day: Mon

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
[illegible]	6:45	~~8:30~~				8:30

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled:

Wells Installed:

Wells/Borings Surface Completed:

Wells/Borings Abandoned:

Wells Developed:

Wells Initially Sampled:

Wells Periodically Sampled:

Wells/Borings/Structures Surveyed:

Work Accomplished - Not Listed Above - Expanded Description:

locked up porta potty which had not been secured over the weekend. attached 0909 key to right front skid (as you face it) with #8 galvanized nail. demobed back to laboratory 7:45-8:15. 8:15-8:30 demobed and ~~[illegible]~~ apprised Kelly of status at 500 40th St.

Deviations From Standard Operating Procedures:

SHELL

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 500 40th St. Project No.: 88-44-361-20 Project Manager: Bo G.

Date: 7/03/90 Day: TUESDAY

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
M. MASON	6:15		9:00	4:00		6:00

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number
GARCIA PUMP SERVICE			9:15	2:00			
(JIM & FAMAN)			9:15	2:00			

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled:
Wells Installed:
Wells/Borings Surface Completed:
Wells/Borings Abandoned:
Wells Developed: MW-8, EW-1
Wells Initially Sampled: MW-8, EW-1
Wells Periodically Sampled:
Wells/Borings/Structures Surveyed:

Work Accomplished - Not Listed Above - Expanded Description:
DEVELOPED AND INITIALLY SAMPLED MW-8 & EW-1.
EW-1 HAD EXCELLENT RECHARGE. WAS ABLE TO PURGE
220 GAL. IN ~ 1 HR. AND WELL REMAINED 80% RECHARGED.
MW-8 HAD MODERATE RECHARGE
WELL NEED TO BE COMPLETED
PUT LOCK ON MW-8
BOTH MW-8 & EW-1 NEED TO BE DEDICATED WITH
1" PVC PIPE WITH 1" FOOT VALVE.
BOTH WELLS CONTAINED LARGE AMOUNT OF CLAYS/SILTS.

Deviations From Standard Operating Procedures:
BOTH WELLS HAVE BEEN COVERED WITH A PLY WOOD BOARD
WITH BOLTS ON EVERY CORNER. THE BOARD OVER EW-1
HAS ONLY 1 BOLT DUE TO THE DIFFICULTY I HAD TRYING
TO PUT THE OTHER BOLTS BACK IN.

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 500 40TH ST Project No.: 8844361-20 Project Manager: B. G.

Date: 7/10/90 Day: TUES.

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
MARION	7:00	7:30	8:00	9:15	9:45	10:00

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled:
Wells Installed:
Wells/Borings Surface Completed:
Wells/Borings Abandoned:
Wells Developed:
Wells Initially Sampled:
Wells Periodically Sampled:
Wells/Borings/Structures Surveyed:

Work Accomplished - Not Listed Above - Expanded Description: REPLACED AND OR REPAIRED SLEEVES & LAGS/WASHERS FOR TRENCH COVERS IN ALLEYWAY;

*RECOMMENDATION - COVER LAG HOLES W/ DUCT TAPE OR PLUG HOLES W/ CORKS OR PAPER

Deviations From Standard Operating Procedures:

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 920 40th St Project No.: 88 44 361 20 Project Manager: BOG

Date: 7/13 Day: Friday

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
Jim				7:00	7:30	8:00

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled:
Wells Installed:
Wells/Borings Surface Completed:
Wells/Borings Abandoned:
Wells Developed:
Wells Initially Sampled:
Wells Periodically Sampled:
Wells/Borings/Structures Surveyed:

Work Accomplished - Not Listed Above - Expanded Description:
transit to-fro and demob of supplies

Deviations From Standard Operating Procedures:

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 500 40th ST. Project No.: 88-44-361-20 Project Manager: Bo G.

Date: 7/31/90 Day: _____

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
KS	~~1:00~~					5:30
T.S.	~~1:00~~ 1:30					4:30

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled: _____
Wells Installed: _____
Wells/Borings Surface Completed: _____
Wells/Borings Abandoned: _____
Wells Developed: _____
Wells Initially Sampled: _____
Wells Periodically Sampled: _____
Wells/Borings/Structures Surveyed: EW-1, MW-8

Work Accomplished - Not Listed Above - Expanded Description: ARRIVED ONSITE TO SURVEY NEW WELLS — EW-1, MW-8! CAR WAS PARKED OVER EW-1, DELAYED FINALLY FOUND OWNER HAD PERSON MOVE CAR - BEGAN SETTING TRAVERSE POINTS TO START SURVEYING — SURVEYED in EW-1, MW-8 — COVERED BACK UP WITH PLYWOOD AND BOLTED DOWN - TRAVEL

Deviations From Standard Operating Procedures: SHOULD HAVE SOMEONE GO BACK OUT TAKE OFF THE PLYWOOD — FINISH GROUTING UP TO TOP OF CRISTY BOX!! LOOKS BAD — WHAT ABOUT NEIGHBORS FENCE?

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 500 40th ST. Project No.: 88-44-361-20 Project Manager: BO

Date: 8-2-90 Day: Thurs.

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
KS	3:30					5:00

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled:
Wells Installed:
Wells/Borings Surface Completed:
Wells/Borings Abandoned:
Wells Developed:
Wells Initially Sampled:
Wells Periodically Sampled:
Wells/Borings/Structures Surveyed:

Work Accomplished - Not Listed Above - Expanded Description: CALLS. for Survey @ 500 40th ST. ON NEW WELLS

Deviations From Standard Operating Procedures:

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 500 40th Project No.: 884436/20 Project Manager: BG

Date: 8/16/90 Day: Thursday

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
Tom			9:30	10:00		

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled:
Wells Installed:
Wells/Borings Surface Completed:
Wells/Borings Abandoned:
Wells Developed:
Wells Initially Sampled:
Wells Periodically Sampled:
Wells/Borings/Structures Surveyed:

Work Accomplished - Not Listed Above - Expanded Description:
9:30-10:00 Contacted Contractor re: fence rebuild on site

Deviations From Standard Operating Procedures:

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 500 40th ST. Project No.: 88-44-361-20 Project Manager: Bo

Date: 8-20-90 Day: Mon.

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
KS	6:15					2:45 pm

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled: _____
Wells Installed: _____
Wells/Borings Surface Completed: _____
Wells/Borings Abandoned: _____
Wells Developed: _____
Wells Initially Sampled: _____
Wells Periodically Sampled: _____
Wells/Borings/Structures Surveyed: _____

Work Accomplished - Not Listed Above - Expanded Description: Calcs – Plotting – Drafting – New wells

Deviations From Standard Operating Procedures: _____

CONVERSE ENVIRONMENTAL WEST
Water Sampling Form

Job # 88-44-361.20 Site 500 40th St, Oak. Sampling Team MM/RPC

Date Aug. 20 1990 Well #/Source OMW-6 Lab Sample I.D.# _____

Field conditions Sunny, warm

Describe Equipment D-Con Before Sampling This Well Alconox wash, water rinse, final rinse for water level probe; rest of equipt. pre-pkgd.

Describe All Meter/Equipment Calibration p.H. meter calibrated at field office to 7.0 and 4.0 standards; OVM calibrated at field office to iso-but. 100 ppm

Total Depth of Well 20.50 ft Time 1357 OVM Reading High 396* Average ~100-150

Depth to Water Before Pumping 10.18 Product Present YES (NO) (Circle) Thickness _____

Height of Water Column (ft) 10.32 2" .16 3" .37 (4" .65) 6" 1.47 = Volume 6.71 * Purge Multiple 3 = Volume to Purge 20.12 (Gal)

Depth Purging From 20.50

Time Purging Begins 1407 Notes on Initial Discharge Clear, Slight Petro Odo

Pre-Purge Sample (Check) Sheen no Petro Odor slight Clear yes Other (Describe under comments)

Time	Volume Purged	pH	Conductivity (x10)	T	Notes
1407	PP	6.71	107	22.5°C	"Hach one" meter does pH & temp. both.
1416	7	6.68	110	24.0	
1417	10	6.69	109	22.9	
1418	15	6.70	109	22.6	
1420	20	6.71	109	22.5	
14:42					

Time	Volume Purged	pH	Conductivity	T	Notes
14:50					

Time Sample Collection Begins ~~XXXX~~ Time Sample Collection Ends ~~XXXX~~ Total Volume Purged 20

Depth to Water for 80% Recharge 12.24 Depth to Water After Total Purge 18.60

DTW = 18.60 at 1421
DTW = 15.00 at 1428
DTW = 12.34 at 1439

DTW = 11.90 at 14:42
DTW = _____ at _____
DTW = _____ at _____

Dissolved oxygen measured? YES (NO) (circle) Barometric Pressure _____ Ambient D.O. ppm _____

Sample Temp _____ Sample D.O. _____ ppm

Comments: * well next to traffic lane; well has foot valve, max OVM while purging = 55 ppm upwind, 6* away.

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 500 40th St 8844 Project No.: 8844 36120 Project Manager: BG

Date: 8/20/90 Day: monday

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
Tom	7:30	8:30				

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled:
Wells Installed:
Wells/Borings Surface Completed:
Wells/Borings Abandoned:
Wells Developed:
Wells Initially Sampled:
Wells Periodically Sampled:
Wells/Borings/Structures Surveyed:

Work Accomplished - Not Listed Above - Expanded Description:

Contacted Contractors for fence erection @ 500 40th St. Asked them to send proof of Workers Comp and Public liability. Done Ink Construction has $500,000 liability, to bad coverage.

Deviations From Standard Operating Procedures:

EDITED DATA
Reviewed By:
Date: 8/27/90

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 500 40th Project No.: 8844361.20 Project Manager: BG

Date: 8/23/90 Day: Thursday

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
Tim	9:30	10:30				

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled:
Wells Installed:
Wells/Borings Surface Completed:
Wells/Borings Abandoned:
Wells Developed:
Wells Initially Sampled:
Wells Periodically Sampled:
Wells/Borings/Structures Surveyed:

Work Accomplished - Not Listed Above - Expanded Description:
contacted Contractors re: fence rebuild

Deviations From Standard Operating Procedures:

EDITED DATA
Reviewed By:
Date: 8/29/90

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: SDO 40th Project No.: 88 44 36 20 Project Manager: BG

Date: 8/24/90 Day: Friday

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
Tim	7:30	8:30	9:00	10:00		

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled:
Wells Installed:
Wells/Borings Surface Completed:
Wells/Borings Abandoned:
Wells Developed:
Wells Initially Sampled:
Wells Periodically Sampled:
Wells/Borings/Structures Surveyed:

Work Accomplished - Not Listed Above - Expanded Description:
talked to Contractor re: bid for fence
no contractor will be able to perform
work by 8/28. Need to wait for Contractors

Deviations From Standard Operating Procedures:

EDITED DATA
Reviewed By: BG
Date: 8/27/90

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 500 40TH ST. Project No.: 8844361-20 Project Manager: BOG.

Date: 8/27/00 Day: MON.

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
MARION	7:30	7:40	9:30	10:15	11:00	12:00

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled:
Wells Installed:
Wells/Borings Surface Completed:
Wells/Borings Abandoned:
Wells Developed:
Wells Initially Sampled:
Wells Periodically Sampled:
Wells/Borings/Structures Surveyed:

Work Accomplished - Not Listed Above - Expanded Description: ARRANGED FOR FLASH SAFETY TO DROP-OFF BARRICADES ON SITE. CALL OAKLAND P.D. TO INFORM THEM OF MY ARRIVAL AND FOR CLEARENCE. PICKED UP TRAFFIC SIGNS AT OFFICE OF TRAFFIC CONTROL. SGT. MC GUFFEY NOT AVAILABLE MUST FALLOW-UP AFTER 12:00. 24 HOUR CLEARENCE.

Deviations From Standard Operating Procedures:

EDITED DATA
Reviewed By:
Date: 9/4/01

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 88-44-361-20 Project No.: 500 40th St. Project Manager: B.G.

Date: 8/28/90 Day: TUESDAY

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
M. MASON	7:30		8:45	3:20	4:10	4:45
R. CEMBER	7:30		8:45	3:20	4:10	4:45

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled:
Wells Installed:
Wells/Borings Surface Completed:
Wells/Borings Abandoned:
Wells Developed:
Wells Initially Sampled: ~~[illegible]~~
Wells Periodically Sampled: MW-2, MW-3, MW-5, OMW-6
Wells/Borings/Structures Surveyed:

Work Accomplished - Not Listed Above - Expanded Description:
ARRIVED ON SITE AND TOOK DEPTH-TO-WATER & OVM READINGS ON ALL WELLS.
PURGED AND SAMPLED MW-2, MW-3, MW-5, OMW-6. ALL WELLS WERE GOOD RECHARGERS.
ALL WELLS WERE DEDICATED WITH PVC PIPE, ALL HAD FOOT VALVES EXCEPT MW-2.
NOTED THAT MW-8 & EW-1 NEED TO BE DEDICATED WITH PVC PIPE AND FOOT VALVES

Deviations From Standard Operating Procedures:
NOTED VERY STRONG OVM READINGS IN DRUM USED FOR MW-2. DID NOT USE ON ANY OTHER WELL.

CONVERSE ENVIRONMENTAL WEST
Water Sampling Form

Job # 88-44-361-20 Site 500 40th St. Sampling Team MM / RPC

Date 8/28/90 Well #/Source MW-2 Lab Sample I.D.# _____

Field conditions Sunny, warm

Describe Equipment D-Con Before Sampling This Well Alconox Wash, H_2O Rinse, D.I. Final for Water Level Probe

Describe All Meter/Equipment Calibration pH Lab Calibrated to 7.00 & 4.00 Standards, OVM Lab Calibrated to ISOB 100 PPM

Total Depth of Well 19.54 FT. Time 9:23 OVM Reading High 356ppm Average ~ 150-250ppm

Depth to Water Before Pumping 12.02 FT. Product Present YES/(NO) (Circle) Thickness _____

Height of Water Column (ft) 7.52 2" .16 3" .37 (4" .65) 6" 1.47 = Volume 4.89 * Purge Multiple 3 = Volume to Purge 15 (Gal)

Depth Purging From 19.54± FT.

Time Purging Begins 10:38 Notes on Initial Discharge Clear, Slight Petro Odor

Pre-Purge Sample (Check) Sheen _ Petro Odor ✓ Clear ✓ Other (Describe under comments)

Time	Volume Purged	pH	Conductivity X10	T (°C)	Notes
10:38	PP	6.32	60	22.5	clear, slight petro odor slightly cloudy
10:48	5	6.42	40	22.7	slight petro odor slightly cloudy
10:51	10	6.52	40	21.9	slight petro odor slightly cloudy
10:53	15	6.48	40	22.9	slight petro odor slightly cloudy
10:55	18	6.48	40	22.4	slight petro odor

Time	Volume Purged	pH	Conductivity	T	Notes

Time Sample Collection Begins 1:00 Time Sample Collection Ends 1:10 Total Volume Purged 19 gal.

Depth to Water for 80% Recharge 13.52 FT. Depth to Water After Total Purge 17.18 FT.

DTW = 15.89 at 10:59
DTW = 13.35 at 11:06
DTW = 12.40 at 11:16

DTW = 12.16 at 11:36
DTW = 12.10 at 12:09
DTW = _____ at _____

Dissolved oxygen measured? YES/(NO) (circle) Barometric Pressure _____ Ambient D.O. ppm _____

Sample Temp _____ Sample D.O. _____ ppm

Comments: DOES NOT HAVE FOOT VALVE ON END OF PVC.
OVM MAX WHILE PURGING WAS 24 PPM
OVM MAX NEAR DRUM WAS ~ 1000 PPM VERY DIRTY DRUM TO BE DISPOSED OF FOR GRD. WATER SAMPLING. HAZARD TO TECHS.

CONVERSE ENVIRONMENTAL WEST
Water Sampling Form

Job # 88-44-361-20 Site 5004 40th St. Sampling Team MM / RDC

Date 8/28/90 Well #/Source MW-5 Lab Sample I.D.# _____

Field conditions Sunny, warm, breezy

Describe Equipment D-Con Before Sampling This Well Alconox Wash, H_2O Rinse, D.I. Final for Water Level Probe

Describe All Meter/Equipment Calibration pH Lab Calibrated to 7.00 & 4.00 Standards OVM Lab Calibrated to Isob. 100 ppm.

Total Depth of Well 20.22 Time 9:12 OVM Reading High 12 ppm Average ~~0~~

Depth to Water Before Pumping 12.94 Product Present YES (NO) (Circle) Thickness _____

Height of Water Column (ft) 7.28 2" .16 3" .37 (4") .65 6" 1.47 = Volume 4.73 * Purge Multiple 3 = Volume to Purge 15 (Gal)

Depth Purging From 20.22= FT.

Time Purging Begins 12:24 Notes on Initial Discharge clear, no odor

Pre-Purge Sample (Check) Sheen ___ Petro Odor ___ Clear ✓ Other (Describe under comments)

Time	Volume Purged	pH	Conductivity x10	T °C	Notes
12:24	PP	6.42	40	21.9	clear, no odor
12:34	5	6.42	40	22.3	slightly cloudy no odor
12:36	10	6.40	40	22.5	clearing, no odor
12:38	15	6.40	40	22.5	clear, no odor

Time	Volume Purged	pH	Conductivity	T	Notes

Time Sample Collection Begins 12:40 Time Sample Collection Ends 12:50 Total Volume Purged 15 gal.

Depth to Water for 80% Recharge 14.40 FT. Depth to Water After Total Purge 14.08 FT.

DTW = _____ at _____
DTW = _____ at _____
DTW = _____ at _____

DTW = _____ at _____
DTW = _____ at _____
DTW = _____ at _____

Dissolved oxygen measured? YES/NO (circle) Barometric Pressure _____ Ambient D.O. ppm _____
Sample Temp _____ Sample D.O. _____ ppm
Comments: _____

CONVERSE ENVIRONMENTAL WEST

Well Sampling Summary

Project Name: 500 40TH ST.
Project Number: 68-44-361-20
Date: 8/28/90
Inspector: MM/RPC

Well Number	Time	Total Depth	Depth to Water	Comments
MW-2	9:23	19.54	12.02	~150-250 ppm; 356 ppm max
MW-5	9:12	20.22	12.94	0 ppm OV; 12 ppm max
MW-3	9:09	18.73	11.02	1.7 ppm OV-15 ppm max
MW-8	9:52	38.25	12.95	1.7 ppm ; 6 ppm max
EW-1	9:40	38.30	13.11	1.7 ppm; 12 max
OMW-6	9:33	20.50	10.18	~100-150 ppm; 396 max *
OMW-9	10:05	17.25	9.88	0 ppm; 9 max
OMW-10	10:09	16.50	9.89	0 ppm; 13 max
MW-4	9:16	14.95	12.26	

*15 feet from traffic

CONVERSE ENVIRONMENTAL WEST
Water Sampling Form

Job # 88-44-361-20 Site 500 40th St. Sampling Team MM / RPC

Date 8/28/90 Well #/Source MW-3 Lab Sample I.D.# 900828 (Labeled 1:50)

Field conditions Sunny, Warm

Describe Equipment D-Con Before Sampling This Well Alconox Wash, H_2O Rinse, D.I. Final for Water Level Probe

Describe All Meter/Equipment Calibration pH Lab Calibrated to 7.00 & 4.00 Standards, OVM Lab Calibrated to ISOB, 100 PPM

Total Depth of Well 18.73 FT. Time 9:09 OVM Reading High 15ppm Average 1.7 ppm

Depth to Water Before Pumping 11.02 FT. Product Present YES (NO) (Circle) Thickness _____

Height of Water Column (ft) 7.71 2" .16 3" .37 (4" .65) 6" 1.47 = Volume 5.01 * Purge Multiple 3 = Volume to Purge 16 (Gal)

Depth Purging From 18.73 ± FT.

Time Purging Begins 11:19 Notes on Initial Discharge Clear, No odor

Pre-Purge Sample (Check) Sheen _ Petro Odor ___ Clear ✓ Other (Describe under comments)

Time	Volume Purged	pH	Conductivity X10	T (°C)	Notes
11:19	PP	6.50	40	23	Clear, No odor
11:28	6	6.54	40	23.4	Clear, Slight Sulphur odor
11:30	11	6.56	40	23.4	Clear, Slight Sulphur odor
11:32	16	6.55	40	23.4	Clear, Slight Sulphur odor
___	___	___	___	___	___

Time	Volume Purged	pH	Conductivity	T	Notes
___	___	___	___	___	___
___	___	___	___	___	___
___	___	___	___	___	___
___	___	___	___	___	___
___	___	___	___	___	___

Time Sample Collection Begins 1:30 Time Sample Collection Ends 1:40 Total Volume Purged 18 gal.

Depth to Water for 80% Recharge 12.56 FT. Depth to Water After Total Purge 15.12 FT.

DTW = 12.50 at 11:39
DTW = 11.14 at 12:06
DTW = _____ at _____

DTW = _____ at _____
DTW = _____ at _____
DTW = _____ at _____

Dissolved oxygen measured? YES (NO) (circle) Barometric Pressure _____ Ambient D.O. ppm _____

Sample Temp _____ Sample D.O. _____ ppm

Comments: HAS FOOT VALVE ON END OF PVC.

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 500 40th St. Project No.: 88-44-361-20 Project Manager: Bo G.

Date: 8/29/30 Day: WEDNESDAY

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number
M. MASON	7:45		9:45	3:40			4:45
R. CEMBER	7:25		9:45	3:40			4:45

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled:
Wells Installed:
Wells/Borings Surface Completed:
Wells/Borings Abandoned:
Wells Developed:
Wells Initially Sampled:
Wells Periodically Sampled: OMW-9 & OMW-10
Wells/Borings/Structures Surveyed:

Work Accomplished - Not Listed Above - Expanded Description:
LOADED TRUCK WITH MATERIALS.
ARRIVED ON SITE. STARTED TO PURGE MW-4. NOTIFIED FROM FIELD OFFICE TO STOP, NO NEED TO SAMPLE MW-4.
~~EWR~~ BROUGHT UP PVC PIPE IN OMW-9 DUE TO LEAKING UNION.
PUT UNION UNDERWATER AND ADDED TEFLON TAPE. PURGED AND SAMPLED OMW-9. PURGED AND SAMPLED OMW-10.
BOTH NEEDED TO RECHARGE BEFORE SAMPLING.
DEDICATED EW-1 & MW-8 WITH PVC PIPE (38 FT. EACH) AND FOOT VALVE. EW-1 HAD STEEL UNION, MW-8 HAS PVC UNION.

Deviations From Standard Operating Procedures:

NOTE THAT EW-1 & MW-8 ARE NOT FINISHED, NOT FLUSH CONCRETE. STILL COVERED WITH WOOD PLY BOARDS AND SCREWS CANNOT FIT INTO HOLES BECAUSE OF DIRT. EACH BOARD @ HAS ONLY 1 SCREW.

ALSO NOTE: DRUMS, SOME WERE @ 1000 PPM OVM READINGS INSIDE. COULD NOT USE DUE TO FUMES ESCAPING WHILE FILLING.

CONVERSE ENVIRONMENTAL WEST
Water Sampling Form

Job # 88-44-361-20 Site 500 40th St. Sampling Team MM/RPC

Date 8/29/90 Well #/Source MW-4 Lab Sample I.D.# _____

Field conditions Sunny, warm

Describe Equipment D-Con Before Sampling This Well Alconox Wash, H_2O Rinse, D.I. Final for Water Level Probe

Describe All Meter/Equipment Calibration pH Lab Calibrated to 7.00 & 4.00 Standards, OVM Lab Calibrated to ISOB 100 PPM.

Total Depth of Well 14.95 FT. Time 9:16 (8/28/90) OVM Reading High 0 Average 0

Depth to Water Before Pumping 12.26 FT. Product Present YES/NO (Circle) Thickness _____

Height of Water Column (ft) 2.69 2" .16 3" .37 (4" .65) 6" 1.47 = Volume 1.75 * Purge Multiple 3 = Volume to Purge 5.25 (Gal)

Depth Purging From 14.95± FT.

Time Purging Begins 10:00 Notes on Initial Discharge Clear, No odor

Pre-Purge Sample (Check) Sheen _ Petro Odor ___ Clear ✓ Other (Describe under comments)

Time	Volume Purged	pH	Conductivity x10	T (°C)	Notes
10:00	PP	6.39	40	21.9	
	2			STOP	
	4			TOLD	NOT SAMPLE
	6				

Time	Volume Purged	pH	Conductivity	T	Notes
				TO	

Time Sample Collection Begins _____ Time Sample Collection Ends _____ Total Volume Purged _____

Depth to Water for 80% Recharge 12.80 FT. Depth to Water After Total Purge _____

DTW = _____ at _____
DTW = _____ at _____
DTW = _____ at _____

DTW = _____ at _____
DTW = _____ at _____
DTW = _____ at _____

Dissolved oxygen measured? YES/(NO) (circle) Barometric Pressure _____ Ambient D.O. ppm _____

Sample Temp _____ Sample D.O. _____ ppm

Comments: WELL WAS DEDICATED WITH PVC BUT WILL HAND BAIL WITH DISPOSABLE BAILER

CONVERSE ENVIRONMENTAL WEST
Water Sampling Form

Job # 88-44-361-20 Site 500 40th. St. Sampling Team MM/RPC

Date 8-29-90 Well #/Source OMW-10 Lab Sample I.D.# _____

Field conditions Sunny, warm

Describe Equipment D-Con Before Sampling This Well Alconox Wash, H₂O Rinse, D.I.
Final for Water Level Probe

Describe All Meter/Equipment Calibration pH Lab Calibrated to 7.00 & 4.00 Standards,
OVM Lab Calibrated to ISOB 100 PPM.

Total Depth of Well 16.50 FT. Time 10:09 (8/28/90) OVM Reading High 13 ppm Average 0

Depth to Water Before Pumping 9.89 FT. Product Present YES/(NO) (Circle) Thickness _____

Height of Water Column (ft) 6.61 2" .16 3" .37 (4" .65) 6" 1.47 = Volume 4.3 * Purge Multiple 3 = Volume to Purge 13 (Gal)

Depth Purging From _____

Time Purging Begins 11:52 Notes on Initial Discharge Clear, Slight Petro Odor No Sheen

Pre-Purge Sample (Check) Sheen _ Slight Petro Odor ✓ Clear ✓ Other (Describe under comments)

Time	Volume Purged	pH	Conductivity (x10)	T (°C)	Notes
11:52	PP	6.89	40	20.6	CLEAR, Slight Petro Odor
11:59	5	6.71	50	22.4	cloudy, Hi brn, odor
12:19	10	6.76	50	22.9	cloudy, Hi brn, odor
12:36	13	6.93	50	24.4	cloudy, brown, slight odor

Time	Volume Purged	pH	Conductivity	T	Notes

Time Sample Collection Begins 1:30 Time Sample Collection Ends 1:40 Total Volume Purged 13 gal

Depth to Water for 80% Recharge 11.21 FT. Depth to Water After Total Purge 14.15 FT.

DTW = 10.19 at 1:27
DTW = _____ at _____
DTW = _____ at _____

DTW = _____ at _____
DTW = _____ at _____
DTW = _____ at _____

Dissolved oxygen measured? YES/NO (circle) Barometric Pressure _____ Ambient D.O. ppm _____
Sample Temp _____ Sample D.O. _____ ppm

Comments: PVC IN GOOD SHAPE WELD D.T. WATER [illegible]
WELL WAS PUMPED DOWN NEAR TOP BETWEEN [illegible] AT 13 GALS.
N 15 FT THEY COULD [illegible]
CRACK IN TOP OF CASE [illegible]

CONVERSE ENVIRONMENTAL WEST
Water Sampling Form

Job # 88-44-361-20 Site 500 40th St. Sampling Team MM/RPC

Date 8/29/90 Well #/Source OMW-9 Lab Sample I.D.# ____

Field conditions Sunny, warm

Describe Equipment D-Con Before Sampling This Well Alconox Wash, H_2O Rinse, D.I. Final for Water Level Probe

Describe All Meter/Equipment Calibration pH Lab Calibrated to 7.00 & 4.00 Standards, OVM Lab Calibrated to ISOB. 100 PPM

Total Depth of Well 17.25 FT. Time 10:05 (8/28/90) OVM Reading High 19 ppm Average 0

Depth to Water Before Pumping 9.88 FT. Product Present YES/NO (Circle) [NO circled] Thickness ____

Height of Water Column (ft) 7.37 2" .16 3" .37 4" .65 [circled] 6" 1.47 = Volume 4.79 * Purge Multiple 3 = Volume to Purge 15 (Gal)

Depth Purging From 17.25± FT.

Time Purging Begins 10:36 Notes on Initial Discharge Clear, some floating debris, slight petro odor, No sheen

Pre-Purge Sample (Check) Sheen __ Slight Petro Odor ✓ Clear ✓ Other (Describe under comments)

Time	Volume Purged	pH	Conductivity x10	T (°C)	Notes
10:36	PP	6.64	50	20.3	clear, slight petro odor
11:10	5	6.66	50	21.7	clear, slight petro odor
11:13	10	6.72	50	21.1	Clear, slight petro odor
11:23	15	6.85	50	21.2	cloudy, slight odor
11:35	20	6.77	50	21.7	clear, slight odor

Time	Volume Purged	pH	Conductivity	T	Notes

Time Sample Collection Begins 1:50 Time Sample Collection Ends 2:00 Total Volume Purged 20 gal.

Depth to Water for 80% Recharge 11.35 FT. Depth to Water After Total Purge 15.53 FT.

DTW = 15.82 at 11:16 (STOPPED TO LET RECHARGE) DTW = 14:60 at 11:33 (WILL START PUMP)
DTW = 14.52 at 11:21 (WILL RESTART PUMP) DTW = 10.13 at 1:46
DTW = 15.24 at 11:30 (STOPPED TO LET RECHARGE) DTW = ____ at ____

Dissolved oxygen measured? YES/NO (circle) Barometric Pressure ____ Ambient D.O. ppm ____
Sample Temp ____ Sample D.O. ____ ppm
Comments: [illegible] ADD TEFLON TAPE BETWEEN AND [illegible] PUMPED [illegible]

Converse Environmental West FORM\WATER SAMPLING_2.FRM (Rev. 6/12/90)

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 800 40th Project No.: 844361 20 Project Manager: BG

Date: 8/30/96 Day: Thursday

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
Tom	9:00					10:15

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled:
Wells Installed:
Wells/Borings Surface Completed:
Wells/Borings Abandoned:
Wells Developed:
Wells Initially Sampled:
Wells Periodically Sampled:
Wells/Borings/Structures Surveyed:

Work Accomplished - Not Listed Above - Expanded Description:
Conducted Contractor and w/BO re: Status of Site.

Deviations From Standard Operating Procedures:

EDITED DATA
Reviewed By: BS
Date: 9/4/96

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 520-40* Project No.: 8844361 20 Project Manager: BC

Date: 8/31/90 Day: Friday

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
Kim	8:00					8:30
	10:15					12:00

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled:
Wells Installed:
Wells/Borings Surface Completed:
Wells/Borings Abandoned:
Wells Developed:
Wells Initially Sampled:
Wells Periodically Sampled:
Wells/Borings/Structures Surveyed:

Work Accomplished - Not Listed Above - Expanded Description:
Talked w/ Contractors & Jane
Well: L.V. 30 and Dolores re: Contract
for Jane

Deviations From Standard Operating Procedures:

EDITED DATA
Reviewed By:
Date: 7/4/96

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT - SHELL OIL CO.

Project: 88-44-361-20 Project No.: 500 40th Oakland Project Manager: BG

Date: 9-27-90 Day: Thursday

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
R. GUSTINCIC	1040					1200

SUBCONTRACTORS

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End	Ticket Number

WORK ACCOMPLISHED

Wells/Borings Bored/Sampled:
Wells Installed:
Wells/Borings Surface Completed:
Wells/Borings Abandoned:
Wells Developed:
Wells Initially Sampled:
Wells Periodically Sampled:
Wells/Borings/Structures Surveyed:

Work Accomplished - Not Listed Above - Expanded Description:
I MET AT THE SITE WITH Mr. BYRON VELDER - representative of the local Chem. THE MEETING WAS CALLED BY Mr. Chen IN ORDER TO CLARIFY SEWER LEAK PROBLEM. I EXPLAINED TO MR. VELDER THAT INSTALLATION OF TWO WELLS AT THE SITE IS NOT CONNECTED WITH SEWER CROSSING.

Deviations From Standard Operating Procedures:

ATTACHMENTS

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.

GROUNDWATER MONITORING WELL CONSTRUCTION

GROUNDWATER MONITORING WELL CONSTRUCTION

BOREHOLE DESIGN

Casing Diameter: The minimum diameter of well casings shall be 2 inches (nominal). Four-inch diameter well casings shall be preferred.

Borehole Diameter: The diameter of the borehole shall be a minimum of 4 inches and a maximum of 12 inches greater than the diameter of the well casing.

Shallow (Unconfined) Zone Wells: When groundwater is encountered or known to be within 45 feet of the ground surface, the borehole will be advanced through the aquifer to a competent aquitard. A competent aquitard is defined as being greater than 5 feet thick. To test the competency of the aquitard, the borehole will be drilled five feet into it. Once confirmed, the excess borehole shall be sealed with bentonite, concrete, or cement. The screened interval will begin 5 feet above the saturated zone and extend the full thickness of the aquifer or 20 feet into the saturated zone, whichever is reached first. The well screen will not extend into the aquitard, nor shall the screened interval exceed 25 feet in length.

If an aquitard is found to be less than 5 feet thick, it is assumed to represent a local lens. If the aquifer is greater than 20 feet thick and no competent aquitard is present, the well screen will be placed in the interval of 5 feet above and not more than 20 feet below the top of the saturated zone.

Deep (Confined) Zone Wells: Any monitoring well to be screened below the upper aquifer shall be installed as double-cased well. A steel conductor casing shall be placed through the upper water-bearing zone to prevent aquifer cross-contamination.

The conductor casing shall be installed in the following manner: a large diameter borehole (typically 18 inches) shall be drilled until it is determined that the first competent aquitard has been reached. A low carbon steel conductor casing shall be placed in the borehole to the depth drilled. Centralizers shall be used to center the casing in the borehole. The annular space between the conductor casing and the formation shall be cement-grouted from bottom to top by tremie pipe method. The grout shall be allowed to set for a minimum of 72 hours.

Drilling may continue inside the conductor casing, with a drill bit of smaller diameter than the conductor casing. If additional known aquifers are to be fully penetrated, the procedure can be repeated with successively small diameter conductor casings.

The bottom of the well screen in a confined aquifer shall be determined by presence or lack of a competent (5 foot) aquitard as described above. The screened interval in a confined zone shall extend across the entire saturated zone of the aquifer or to a length of 20 feet, which ever is less. The screened zone and filter pack shall not cross connect to another aquifer.

CONSTRUCTION MATERIALS

Casing Materials: Well casing shall be constructed of materials that have the least potential for affecting the quality of the sample, have sufficient strength, and resist rapid deterioration from corrosion. The most suitable material for a particular installation will depend upon the parameters to be monitored. Acceptable materials include PVC, stainless steel, or low carbon steel.

Casing Joints: Joints shall be connected by flush threaded couplers. Organic bonding compounds and solvents will not be used on joints.

Well Screen Slots: Well screen shall be factory slotted. The size of the slots shall be selected to allow sufficient groundwater flow to the well for sampling, minimize the passage of formation materials into the well, and ensure sufficient structural integrity to prevent the collapse of the intake structure.

Casing Bottom Plug: The bottom of the well casing will be permanently plugged, either by flush threaded screw-on or friction cap. Friction caps shall be secured with stainless steel set screws. No organic solvents or cements will be applied.

Filter Pack Material: Filter pack envelope materials shall be durable, waterworn, and washed clean of silt, dirt, and foreign matter. Sand size particles shall be screened silica sand. Particles shall be well rounded and graded to an appropriate size for retention of aquifer materials.

Bentonite Seal Material: Bentonite shall be pure and free of additives that may effect groundwater quality. Bentonite shall be hydrated with clean water.

Grout Seal Material: Cement grout shall consist of a proper mixture of Type I/II Portland cement, hydrated with clean water. Up to 3% bentonite may be added to the mixture to control shrinkage.

CONSTRUCTION PROCEDURES

Decontamination: All downhole tools, well casings, casing fittings, screens, and all other components that are installed in the well shall be thoroughly cleaned immediately before starting each well installation. When available, each component shall be cleaned with a high temperature, high pressure washer for a minimum of 5 minutes. When a washer is not available, components shall be cleaned with clean water and detergent or tri-sodium phosphate, rinsed in clean water, then rinsed in distilled water.

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

Drilling Methods: Acceptable drilling methods include solid and hollow stem auger, percussion, direct circulation (mud) rotary, and air circulation direct, and reverse rotary. The best alternative is that which minimizes the introduction of foreign materials or fluids.

If drilling mud is employed, drilling fluid additives shall be limited to inorganic and non-hazardous compounds. Compressed air introduced to the borehole shall be adequately filtered to remove oil and particulates.

Soil Sampling Methods: Soil sampling shall be recovered according to protocols described in CEW Standard Operating Procedure: Soil Sampling of Boreholes.

Casing Installation: The casing will be set under tension to ensure straightness. Centralizers should be used where necessary to avoid unnecessary curvature or stress to the casing.

Sand Pack Installation: The sand pack will be installed so as to avoid bridging and the creation of void spaces. The tremie pipe method will be used where installation conditions or local regulations require. Drilling mud, when used, must be thinned prior to pack placement. The sand pack shall cover the entire screened interval and rise a minimum of two feet above the highest perforation.

Bentonite Seal Placement: The bentonite seal will be placed by a method that prevents bridging. Bentonite pellets can be placed by free fall if proper sinking through annular water can be assured. Bentonite slurry will be placed by the tremie pipe method from the bottom upward. The bentonite seal should be not less than 1 foot in thickness above the sand pack.

Grout Seal Placement: The cement grout mixture shall be hydrated with clean water and thoroughly mixed prior to placement. If substantial groundwater exists in the borehole, the grout shall be placed by tremie pipe method from the bottom upward. In a dry borehole, the grout may be surface poured. Grout will be placed in one continuous lift and will extend to the surface or to the well vault if the wellhead is completed below grade. A minimum of 5 feet of grout seal will be installed, unless impractical due to the shallow nature of the well.

Surface Completion: The wellhead will be protected from fluid entry, accidental damage, unauthorized access, and vandalism. A watertight cap shall be installed on the top of the well casing. Access to the casing should be controlled by a keyed lock.

Wellheads completed below grade will be completed in a concrete and/or steel vault, installed to drain surface runoff away from the vault opening.

Well Identification: Each well will be identified by well number, owner, and type of installation. Construction data, including depth, hole and casing diameter and screened interval will be noted.

WELL DEVELOPMENT

WELL DEVELOPMENT

INTRODUCTION

Newly installed groundwater monitoring wells will be developed to restore natural hydraulic conductivity of the formation, remove sediments from the well casing and filter pack, stabilize the filter pack and aquifer material, and ensure turbidity-free groundwater samples.

Wells may be developed by bailing, mechanical pumping, air lift, pumping, surging, swabbing, or an effective combination of methods. Wells will be developed until the well is free of sand, silt, and turbidity.

In some cases where low permeability formations are involved or the drilling mud used fails to respond to cleanup, initial development pumping may immediately dewater the well casing and thereby inhibit development. When this occurs, clean, potable grade water may be introduced into the well, followed by surging of the introduced waters with a surge block. This operation will be followed by pumping. The procedure may be repeated as required to establish full development.

METHODOLOGY

Seal Stabilization: Cement and bentonite annular seals shall set and cure not less than 24 hours prior to well development.

Decontamination: All well development tools and equipment shall be thoroughly cleaned immediately before starting each well installation. When available, each component shall be cleaned with a high temperature, high pressure washer for a minimum of 5 minutes. When a washer is not available, components shall be cleaned with clean water and detergent or tri-sodium phosphate, rinsed with clean water, then rinsed with distilled water.

Development equipment shall not donate to, capture, mask, nor alter the chemical composition of the soils and ground water.

Introduction of Water: Initial development of wells in low permeability formations may dewater the casing and filter pack. When this occurs, clean, potable water can be introduced in to the well to enhance development.

Bailing: Development will begin by bailing to remove heavy sediments from the well casing. Care shall be taken to not damage the well bottom cap during lowering of the bailer.

Surging: Care shall be exercised when using surge block to avoid damaging the well screen and casing. When surging wells screened in coarse (sandy/gravelly) aquifers, the rate of surge block lifting shall be slow and constant. When surging wells screened in fine (silty) aquifers, more vigorous lifting may be require. Between surging episodes, wells will be bailed to remove accumulated sediments.

Pumping: Development pumping rates shall be less than the recharge rate of the well in order to avoid de-watering.

Discharged Water Containment and Disposal: All water and sediment generated by well development shall be collected in 55-gallon steel drums. Development water will be temporarily contained onsite, pending sampling and laboratory analysis. All development water will be transported offsite by a licensed transporter to a licensed hazardous waste disposal or treatment facility. No development water shall be released to the environment.

MEASUREMENTS

Discharged Water Parameters: During development, discharged water shall be measured for the following parameters:

Parameter	Units of Measurement
pH	Units
Electrical Conductivity	umhos
Temperature	Degrees F or C
Turbidity	Nephelometric Turbidity Units (NTU's)
Sediment Production	_____
Depth to Water in Casing	Feet/Tenths
Volume of Water Discharged	Gallons

Sediment Production: Sediment production from the well shall be measured using Imhoff Cone.

Turbidity: The development water turbidity shall be measured using a nephelometer. Turbidity at the conclusion of development should be less than 5 NTU's.

Measurement Frequency: Parameters shall be measured not less than every 3 pre-development casing volumes of water discharged.

Documentation: All parameter measurements shall be documented in writing on CEW Development Logs (example attached). Additional documentation shall include the well owners name, the well designation, the date of development, pre- and post-development depths to water, methods of development, general development and notes and comments.

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.

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.

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 if 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.

MUD ROTARY DRILLING PROCEDURES

MUD ROTARY DRILLING PROCEDURES

Mud rotary will be drilled according to the following procedures:

All drilling equipment (rig, drill bits, drill pipe, mud tub) shall be thoroughly cleaned before drilling begins.

A mud tub shall be set in place and a drilling fluid of bentonite mud or some similar material shall be circulated.

Drilling shall proceed with constant monitoring of drilling speeds (how hard the engine must work in order to turn the bit) and rate of drilling (how quickly the bit cuts through the material) in order to determine subsurface lithology. "Rig chatter" shall be used to determine size or quantity of gravel. Loss of drilling fluid shall be used to determine permeability, e.g., in a gravel layer, large loss of drilling fluid implies clean gravels.

Drilling mud shall be kept thick to minimize "trip time" of cuttings to the surface and allow coarser, representative material to be carried to the surface quickly.

In the event large losses of drilling fluid are encountered, the mud shall be thickened to facilitate building of mud cake on the borehole walls and reduce loss of drilling fluid into the formation.

Sampling may be accomplished by pulling up all drill pipe, removing the drill bit from the borehole and running a sampler (exactly like hollow-stem auger) down the hole.

Mud rotary drilling shall be used in environmental investigations with minimal cross-contamination of aquifers for at least two reasons: (1) the bend produced by the column of mud in the borehole shall cause flow of fluids in the borehole into the formation and not contaminants in the surrounding formation into the borehole; and (2) the mud cake on the borehole walls will reduce communication between the borehole and the surrounding formation.

Mud rotary has the advantage over hollow-steam auger drilling of: (1) being able to drill deeper; and (2) being able to drill larger diameter holes to allow setting of conductor casing.

SAMPLING FOR VOLATILE ORGANICS

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In this sampling, it is especially important that the sample represent conditions existing in the aquifer, not in the well. Differences in water quality characteristics often exist between the water in the well and the surrounding aquifer, particularly in wells used intermittently or infrequently such as monitoring wells. To obtain a representative sample of the aquifer, the well is purged until selected water quality parameters stabilize. The parameters should include pH, electrical conductivity and temperature. Once consistent readings are obtained for the three parameters, the discharge should represent formation waters rather than potentially stagnant water in the well. The purge volume should amount to between three and five well volumes.

After the well is purged, the discharge shall be decreased to the slowest rate obtainable. The sampler shall be careful to not contaminate the sample. The following practices shall be followed:

1. Do not touch the lip of the bottles or insides of the septum.
2. Avoid touching the mouth of the discharge tap.
3. Do not splash or agitate the water while the bottle is being filled.
4. Do not smoke, eat or handle any objects not necessary for sampling.
5. Do not sample downwind of any potential volatile organic sources such as car exhausts, open fuel tanks, etc. Note any potential sources in the area if the are unavoidable.
6. Avoid handling the septum. If handling is necessary, use specially prepared and protected forceps or tweezers.

When taking the sample, first rinse the bottle two to three volumes with the well water. The bottle is then filled slowly to prevent entrapment of any air bubbles. The bottle is filled completely such that a meniscus form, essentially "piling up" the water into the bottle. Immediately place the cap on, turn the bottle upside down, tap it a few times and note whether there are any bubbles in the sample. If a bubble exists, discard the sample and repeat sampling including the triple rinse. If a bubble is found on the second attempt, do not repeat the procedure again, but note the bubbles existence on the sample label and also notify the laboratory when it is submitted.

Place the sample in a sealable plastic bag and then into a cooler/ refrigerator. The sample should be protected from any light sources as much as possible.

Deliver the sample to the laboratory as soon as possible. If it cannot be delivered to the lab the same day, store the sample in a refrigerator which maintains a constant temperature of 4°C. It is important that the sample be delivered as soon as possible since the samples must be analyzed within two weeks for the results to be valid. Therefore, the sooner the sample is given to the lab, the more time the lab has to analyze it.