REPORT OF ACTIVITIES
QUARTER 3, 1990

SHELL OIL COMPANY
630 HIGH STREET
OAKLAND, CALIFORNIA

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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 Shell Oil Company (Shell) station ("site") at 630 High Street, Oakland, California (Drawing 1). This report is prepared to fulfill the quarterly reporting requirements as specified in the Work Plan prepared by CEW (March 20, 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 Southeast corner of High Street and Jensen Street in Oakland, California (Drawing 2). The site is approximately 240 feet long by 180 feet wide. Shell operated a retail fuel sales operation on the site, under lease from the property owner, the City of Oakland.

Available data provided by Shell indicates that soil and groundwater contamination by petroleum hydrocarbons exists on the property. This condition has been established by preliminary and advanced remedial investigations conducted by consultants since 1985. A general description of site conditions is included as Appendix A. A chronological summary of environmental activities conducted at the site is presented in Appendix B.

1.2 SCOPE OF ACTIVITIES

The investigative activities conducted during Q3/90 were authorized under an existing purchase order and blanket number from Shell for environmental services at the site. The work completed during Q3/90 consisted of the following activities:

- Collecting groundwater samples from MW-1 through MW-10.

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

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

(2) The multiple working hypothesis process is iterative to the time of closure, 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 (March, 1989) the project critical path (Drawing 3) and the CEW protocols on file with the regulatory agencies of jurisdiction. A Quarter 3, 1990 Activity Summary is presented in Table 1.

2.1 SOIL SAMPLING AND ANALYSES

No soil samples were taken during Q3/90. Previous soil boring information and analytical results are presented in Tables 2 and 3.

2.2 GROUNDWATER SAMPLING AND ANALYSES

Well installation information is presented in Table 4. Groundwater samples were collected on August 1 and 2, 1990 from monitoring wells MW-1 through MW-10 following CEW protocols. These samples were submitted to NET Pacific, Inc., a California-certified laboratory in Santa Rosa, California, following appropriate chain-of-custody. The samples were analyzed for TPH-g, TPH-d, TPH-mo, and BTEX following the recommended analytical methods listed in Table 5. Additional analytical tests were performed for consideration of remediation alternatives. Analytical data for the water samples collected from the monitoring wells are summarized in Tables 6 and 7. Laboratory reports and chain-of-custody forms from Q2/90 monitoring are provided in Appendix C.

2.3 PHYSICAL MONITORING

During Q3/90, wells MW-1 through MW-10 were each tested once for depth to water table and observed for floating product. No measurable thickness of floating product was present. A summary of these results is presented in Table 7.

2.4 EXISTING HYDROGEOLOGIC DATA

CEW is in the process of obtaining records on file with the Alameda County Health Department. Alameda County has not provided CEW with any of this information to date. This research may provide background hydrogeologic information for the site vicinity as well as potential for offsite sources.

SECTION 3

FINDINGS AND DISCUSSION

3.1 SOIL

3.1.1 Stratigraphy

The uppermost unsaturated zone consists of fill, extends approximately four feet below ground surface (bgs), and is comprised of gravel, sand and clay in heterogeneous mixtures. None of the fine-grained sediments contained in the fill appear to constitute a laterally-continuous layer which would potentially impede downward infiltration from the surface (the existing asphalt cover at the site impedes vertical movement). Beneath the fill layer is a clay zone that varies from approximately two to eight feet in thickness. Immediately underlying the clay zone are sands and gravel of interbeds Clay underlies these to a depth of approximately 24 feet bgs.

3.2.1 Results of Chemical Analysis

Soil investigations to date show that trace TPH concentrations are contained in isolated soil samples SB-2, SB-4, MW-1 and MW-10 in the shallow 5 to 10 foot bgs zone near the former underground storage tank area in the northeast portion of the site (Table 3). Detectable concentration levels of toluene are contained in soil samples at the 5 foot zone laterally across the site, (except in MW-5 and MW-8). The vertical and lateral soil contamination is almost completely characterized at the site.

3.2 GROUNDWATER

3.2.1. Physical Parameters

Floating product was not present in the wells monitored during Q3/90. With the exception of MW-4 and MW-6, no petroleum hydrocarbon odors were noted in water collected from wells (Table 7).

3.2.2 Elevation and Gradient

Reported Q2/89

The tops of well casings were not surveyed during Q2/89.

Reported Q3/89

The tops of well casings MW-5 through MW-8 were surveyed to an arbitrary datum for Q3/89. The flow direction varied from southwest to west with a gradient magnitude of approximately 0.005 ft/ft.

Reported Q4/89

Groundwater was measured at approximately 10 feet bgs across much of the site with a southwest/west flow and a gradient of approximately 0.005 ft/ft.

Reported Q1/90

Groundwater depths onsite ranged from 11.5 to 7.73 feet bgs with flow to the west/northwest, and a gradient of approximately 0.042 ft/ft.

Reported Q2/90

Groundwater depths onsite ranged from 7.83 to 11.76 feet bgs with a west/northwest flow and an approximate gradient of 0.0025 ft/ft.

Reported Q3/90

Groundwater depths onsite ranged from 8.33 to 11.98 feet bgs with a westerly flow (Drawing 4).

3.2.3 Results of Chemical Analyses

Following is a list of the principal findings and conclusions from groundwater chemical monitoring at 630 High Street (1989-1990) (Table 6).

Reported Q2/89

TPH-g and TPH-d contamination was indicated in MW-1, near the former tank complex. Two other wells contained low ppm concentrations of TPH-g and TPH-d in groundwater.

The ratio of detectable TPH-g to TPH-d in groundwater ranged from 3:1 to 3:2.

Reported Q3/89

- TPH-g was detected at wells MW-1, and MW-3 through MW-5. The highest concentration was detected at MW-1 (17 ppm).

- TPH-d was detected at wells MW-1, and MW-3 through MW-6. The highest concentration was detected at MW-1 (7.2 ppm).

- TPH-mo was detected at wells MW-1, and MW-3 through MW-6. The highest concentration was detected at MW-1 (1.9 ppm).

- Benzene was detected at wells MW-1, and MW-3 through MW-5. The highest concentration was detected at MW-1 (0.20 ppm).

- Toluene was detected at wells MW-1, and MW-3 through MW-5. The highest concentration was detected at MW-1 (0.18 ppm).

- Ethylbenzene was detected at wells MW-1, and MW-3 through MW-5. The highest concentration was detected at MW-1 (0.059 ppm).

- Xylenes were detected at wells MW-1, and MW-3 through MW-5. The highest concentration was detected at MW-1 (0.55 ppm).

- Lead was not detected at any well.

- Groundwater from MW-1 was analyzed for cadmium, chromium, and zinc. Cadmium and chromium were not detected. Zinc was detected at 0.09 ppm.

- Groundwater from MW-1 was analyzed for oil and grease. These compounds were not detected.

Groundwater from MW-1 was analyzed for chlorinated hydrocarbons by EPA Method 624. Benzene (0.24 ppm), ethylbenzene (0.62 ppm) and xylenes (0.73 ppm) were detected. Toluene was not detected.

Reported Q4/89

- TPH-g was detected at wells MW-1, and MW-3 through MW-5. The highest concentration was detected at MW-1 (13 ppm).

- TPH-d was detected at wells MW-1 through MW-7, and MW-9 through MW-10. The highest concentration was detected at MW-1 (4.4 ppm).

- TPH-mo was detected at wells MW-2, MW-9, and MW-10. The highest concentration was detected at MW-9 (0.54 ppm).

Reported Q1/90

The groundwater analyses for MW-1 continues to contain the highest concentrations of dissolved TPH. The monitoring wells MW-1, MW-3 and MW-5 on eastern side of the site continue after one year of quarterly monitoring to contain detectable concentrations of chemicals tested.

- TPH-g was detected at wells MW-1, MW-3 and MW-4. The highest concentration was detected at MW-1 (11 ppm).

- TPH-d was detected at wells MW-1, MW-3 through MW-6, and MW-10. Concentration detected at MW-1 was 3.8 ppm.

- TPH-mo was not detected at wells MW-1 through MW-10.

Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) were detected at wells MW-1, and MW-3 through MW-5. Concentrations of BTEX detected at MW-1 were 0.24, 0.034, 0.35, and 0.57, respectively.

MW-2 continued to lack detectable concentrations (ND) of TPH-g and BTEX, completing one year of such conditions. MW-2 contained trace TPH-d and trace TPH-mo in December 1989. Consequently, Shell plans to reduce the frequency of monitoring at MW-2 well immediately. Effective 1990, Shell will only monitor MW-2 semi-annually, during February (Q1) and August (Q3) each year.

Reported Q2/90

Selected groundwater analyses follow:

- TPH-g was detected at MW-1, MW-3 through MW-6, and MW-8. The concentration detected at MW-1 was 9.4.

- TPH-d was detected at MW-1 and MW-3 through MW-6. The concentration detected at MW-1 was 3.8.

- Benzene, toluene, ethylbenzene and xylenes (BTEX) were detected at wells MW-1 and MW-3 through MW-5. The concentrations detected in MW-1 were 0.17, 0.035, 0.0086, and 0.39 respectively.

Reported Q3/90

- TPH-mo was not detected at any monitoring wells.

- TPH-g was detected at wells MW-1, MW-3, MW-4, and MW-5. The concentration detected at MW-1 was 10.0 ppm.

- TPH-d was detected in the water samples taken from MW-1 and MW-3 through MW-6. The concentration detected at MW-1 was 4.0 ppm.

- Benzene, toluene, ethylbenzene and xylenes (BTEX) were detected at wells MW-1, MW-3, MW-4 and MW-5. The concentrations detected at MW-1 were 0.25 ppm, 0.03 ppm, 0.0055 ppm, and 0.38 ppm respectively.

Reduced monitoring will recur during Q4/90 (MW-2 will not be sampled). Depth to water and other physical monitoring will continue for all wells on a quarterly basis.

3.2.4 Discussion

The presence of TPH-d, TPH-g and BTEX in groundwater is centered near MW-1, which is located near the former underground fuel and waste oil tanks (Drawing 2 and Table 6).

3.3 SLUG TEST RESULTS

3.3.1 Introduction

On February 27, 1990 slug tests were performed on groundwater monitoring wells MW-5 through MW-9 using slug-in and slug-out methods. The methodology is discussed in detail in the Standard Operating Procedure (SOP) on file with RWQCB.

Briefly, the slug-in/slug-out method consists of quickly raising/lowering the water level in the well then measuring the level at timed intervals until the water level returns to equilibrium. The data recorded during the test is then used in determining hydraulic conductivity and transmissivity using the Bouwer-Rice Method.

3.3.2 The Bouwer-Rice Method

The Bouwer-Rice Method (Bouwer and Rice, 1976 and Bouwer, 1989) is a procedure for calculating the hydraulic conductivity of an aquifer near a well from the rate at which the water level in the well returns to equilibrium after a specific volume is "instantaneously" removed or introduced. The calculation is based on the Theim Equation for steady state flow to a well. The essential element of this method is an empirical equation relating to the effective radius over which the head difference between the equilibrium water level in the aquifer and the water level in the well is dissipated to the geometry of the well. The Theim Equation, and hence the Bouwer-Rice Method, is based on the assumptions that:

1. Drawdown of the water table around the well is negligible;

2. Flow above the water table in the capitallary fringe can be ignored;

3. Head losses as water enters the well are negligible; and

4. The aquifer is homogeneous and isotropic.

The geometry and symbols of a slug-tested well are shown in Drawing 5. The hydraulic conductivity (K), in feet per second is given by a modified form of the Theim Equation:

$$K = [r^2_c \ln(R_e/r_w) \cdot \ln(y_o/y_t)/t] / (2L_e) \quad (1)$$

where:

t	=	time, seconds
y_o	=	drawdown at time zero, feet
y_t	=	drawdown at time (t), feet
R_e	=	effective radial distance over which y is dissipated, feet
r_w	=	radial distance to the undistributed portion of the aquifer, feet
L^*	=	length of the open section of the well, feet
r_c	=	radius of the section of the well where the rise of water level is measured

r'_c is based on the total free-water surface area in the well and the filter pack, and on the effective porosity of the saturated portion of the filter pack.

$$r'_c = [(1-n)r_c^2 + nr_w^2]^{1/2} \quad (2)$$

where:

r_c = inside radius of the well casing, feet

n = effective porosity of the saturated portion of the filter pack

Values for $\ln(R_e/r_w)$ have been determined with an electrical resistance network analog (Bouwer and Rice, 1976) giving an empirical relation:

$$\ln(R_e/r_w) = [1.1/\ln(L_w/r_w)+[A+B\ln[(H-L_w)]]/L_e/r_w/r_w)]^{-1};$$

for $L_w < H$ (partially penetrating well) (3)

and

$$\ln(R_e/r_w)=[1.1/\ln(L_w/r_w) + C/(L_e/r_w]^{-1}$$

for $L_w = H$ (fully penetrating well) (4)

where:

L_w = length of the well section below the water table

H = distance from the water table to the impermeable layer that forms the base of the aquifer

A,B and C are dimensionless parameters determined by Bouwer and Rice [Bouwer and Rice, 1979] and give in a plot as a function of L_e/r_w in Drawing 6. The case where $L_w < H$ can be interpreted as a partially penetrating well, while $L_w = H$ corresponds to the case of a fully penetrating well.

Since y and t are the only variables in equation (1), a plot of ln (y) versus t will be a starting line. Thus a number of y and t measurements can be plotted on semilogarithmic paper, and $[\ln(y_o/y_t)]/t$ determined as the slope of the best fitting line through the plotted points. The drawdown of the water table around the well becomes increasingly significant as the test proceeds, so the data points will deviate from a straight

line for small y and large t (Drawing 7). Thus only the straight line portion of the data should be used to calculate K.

In some cases, users of the slug test have observed that when plotting ln (y_t) versus t as in Figure 3, they sometimes get a double straight line as shown in Drawing 8. The first part (AB) is straight and steep, while the next part (BC) is straight and less steep. At point C, the curve begins its expected deviation from the straight line as the drawdown in the well becomes significant relative to y_t. The first straight line portion is probably due to the fact that in some cases the filter pack is not permeable enough to drain at the same rate as the water level in the well casing when it is lowered for the slug test. When the water level in the filter pack has drained to the level of the water in the well casing itself, the flow in the well slows down and the recovery forms a second, less steep straight line. This second straight line is more indicative of the flow from the undisturbed aquifer. Hence segment BC should be used in calculating K using equation (1).

3.3.3 Field Procedure

Prior to beginning the tests all wells were opened to allow the pressure inside to equilibrate with the ambient air pressure. The water level in wells MW-3, MW-5, MW-6, MW-7, MW-8, and MW-9 were then measured with an electronic depth to water probe.

Next, a Druck 15 pounds per square inch (psi) pressure transducer and an OMNI Data Polycorder 516C data logger were calibrated and used to measure the changing water levels during the slug test. The output of the pressure transducer is a voltage that is proportional to the applied water pressure. The transducer was connected to the data logger which, when calibrated, converts the output voltage of the transducer to pressure in feet of water. Since the response of the pressure transducer is linear, the calibration consists of finding the slope and zero point of the calibration curve by measuring the transducer output at two known water levels.

The slug test procedure, which did not vary from well to well is as follows (see Drawing 9):

1. The calibrated pressure transducer is placed 5-6 feet below the water level. The pressure transducer is connected to the data recorder so that the operator can read directly the height of the water column above the transducer.

2. The static water level above the transducer is recorded (Drawing 9[a]).

3. A clean stainless steel slug with a displacement of 2.58 gallons is lowered into the well, raising the water level (Drawing 9[b]).

4. The test operator waits until the water level in the well returns to the static level (Drawing 9 [c]), then quickly removes the slug. The water level drops below the static level (Drawing 9 [d]).

5. The data recorder logs the time and water level as the well returns to equilibrium.

6. The slug and the transducer are removed from the well, cleaned with detergent, and rinsed with de-ionized water.

3.3.4 Data Analysis

Semi-logarithmic plots of drawdown versus time for the slug-tested wells are given in Drawings 10 through 14. Table 8 gives the geometric measurements of each well.

As seen in each of the drawdown figures, plotted drawdown data for the first 4 to 6 seconds forms a near vertical line. This linear portion is attributed to ground water stored in the filter pack draining quickly into the well casing. Since this first linear portion is not representative of the rate at which water enters the well from the aquifer, it is not used in calculating the hydraulic conductivity (K) of the aquifer.

The time-drawdown curve for MW-5 (Drawing 9), excluding the first linear segment mentioned above, is linear up to approximately t=400 seconds. During this time, the water level in the well has recovered approximately 90% of its equilibrium value. A line has been drawn which represents the "best fit line" or the average of the points.

Drawdown data for well MW-6 (Drawing 11) shows the wavering effect of the transducer during slow recovery. A short distinct line from t≈30 seconds to t≈140 seconds represents approximately 75% recovery of the equilibrium water level. Therefore, the slope of this line is used in determining K.

The slope of the linear portion of the data used for calculating K for well MW-7 (Drawing 12) goes from approximately t=10 seconds to t=1700 seconds. During this time the well has recovered approximately 97%.

Drawign 13 shows the time-drawdown response in well MW-8. The data is linear from approximately t=10 to t=250 seconds and was used to calculate K. During this time the well recovers approximately 98% of the equilibrium water level.

The response of well MW-9 (Drawing 14) shows a generally linear portion from t=10 to t=2600 seconds. This line represents approximately 87% of the well's recovery, thus is used in calculating K.

3.3.5 Discussion of Results

The hydraulic conductivity and the transmissivity for each well are shown in Table 9. As described in the stratigraphy section of the Quarter 2, 1990 Report of Activities (Converse 1990), stratigraphic horizons are discontinuous across the site. The aquifer is derived from thin isolated, but possibly connected, silt to fine sandy silt layers. The relatively low average hydrologic conductivity value confirms this. The average hydrologic conductivity at the site is 10.2 gal/day/ft^2 (1.37 ft/day), which is reasonable for the sandy silt aquifer material (Fetter, 1988).

Using the average hydraulic conductivity for the site, one can calculate an average linear velocity of the ground water flow from Darcy's Law as:

$$V_x = (K/n_e) \cdot (dh/dl)$$

where:

V_x	=	average linear velocity, ft/day
K	=	hydraulic conductivity, ft/day
N_e	=	effective porosity, dimensionless
dh/dl	=	hydraulic gradient, dimensionless

The hydraulic gradient for this site has been recently measured as 0.005. For silts and fine sandy silts the representative value for the effective porosity is in the range of 10 to 15%. Using the average hydraulic conductivity calculated from the slug tests, this provides an average linear velocity ranging from 0.046 to 0.069 ft/day or 17 to 25 ft/yr.

The ground water at this particular site contains only dissolved hydrocarbons which move primarily by advection with the ground water. In the absence of dispersion and retardation (expected to be quite small) these contaminants will, on the whole, travel at about the same rate as the ground water linear velocity.

SECTION 4

NEXT QUARTER ACTIVITIES

4.1 WORK PLAN MODIFICATIONS

Based on the information collected to date, no modifications to the Work Plan are proposed for Q4/90:

4.2 PROPOSED ACTIVITIES

The following activities will be conducted in Q4, 1990:

(1) Continue monitoring groundwater conditions, with modifications as discussed in Section 3.2.3 of this report.

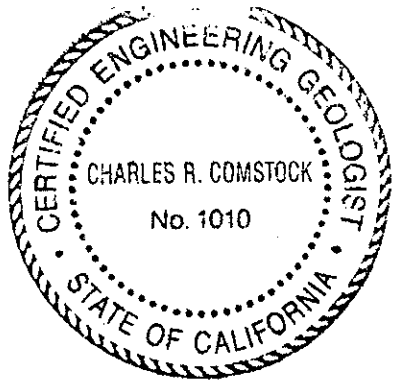
(2) Submit Q4/90 Report.

CERTIFICATION

This report of activities for the Shell Oil Company site at 630 High 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,



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Quarter 3, 1990

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Site Owner:	Shell Oil Company

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RWQCB - see California Regional Water Quality Control Board

TABLES

TABLE 1. ACTIVITY SUMMARY - QUARTER 3, 1990

Shell Oil Company
630 High Street
Oakland, California

Activity	Percent Complete			
	Quarter 3, 1990		Total to Date	
	Onsite	Offsite	Onsite	Offsite
Soil Characterization	85	-----	85	-----
Groundwater Characterization (Dissolved Product)	70	-----	70	-----
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

NOTES:

NA Not Applicable

TABLE 2. SOIL BORING INFORMATION

Shell Oil Company
630 High Street
Oakland, California

Boring No.	Date Drilled	Total Depth (ft bgs)	Completion	Unsaturated Soil Samples (ft bgs)	Saturated Soil Samples (ft bgs)	Highest OVM Reading (ppm)
SB-1	4/27/89	10	Abandoned	5	None	NR
SB-2	4/27/89	10	Abandoned	5,10	None	NR
SB-3	8/17/89	10	Abandoned	5,10	None	1300 @ 5'
SB-4	11/15/89	9	Abandoned	5,9	None	0

NOTES:

NR Not recorded

TABLE 3: RESULTS OF SOIL CHEMICAL ANALYSIS

Concentration (mg/kg)

Boring No.	Date	Sample Depth (ft. bgs)	TPH-g	TPH-d	TPH-mo	Benzene	Toluene	Total Oil and Grease	Xylene	Total Lead
SB-1	04/27/89	5	12*	27	85	<0.025	0.10	NA	0.14	71
SB-2	04/27/89	5	<10	<10	<10	0.042	0.054	NA	<0.075	16
SB-2	04/27/89	5,10**	<10	<10	130	<0.025	0.04	NA	<0.075	10
SB-3	08/17/89	5	<10	<10	<10	<0.025	0.22	290	<0.075	66
SB-3	08/17/89	10	<10	<10	<10	<0.025	0.045	<50	<0.075	4.2
SB-4	11/15/89	5	<1	16	77	<0.0025	0.032	NA	<0.0025	220
SB-4	11/15/89	9	<1	<1	11	<0.0025	0.056	NA	<0.0025	3.9
MW-1	04/25/89	5	11	<10	<10	<0.025	0.11	NA	<0.075	9.6
MW-1	04/25/89	5,10**	63	<10	<10	0.042	0.14	NA	0.16	7.6
MW-2	04/25/89	5	<10	<10	<10	<0.025	0.34	NA	<0.075	13
MW-2	04/25/89	5,10,15**	<10	<10	<10	<0.025	0.15	NA	<0.075	4.0
MW-3	04/26/89	10	<10	<10	<10	<0.025	<0.025	NA	<0.075	3.9
MW-3	04/26/89	5,10**	<10	<10	<10	<0.025	0.068	NA	<0.075	5.1
MW-4	04/26/89	5	<10	<10	<10	0.046	0.21	NA	<0.075	26
MW-4	04/26/89	5,10**	<10	<10	<10	<0.025	0.066	NA	<0.075	27
MW-5	08/17/89	5	<10	<10	<10	<0.025	<0.025	<50	<0.075	14.0
MW-5	08/17/89	10	<10	<10	<10	<0.025	<0.025	<50	<0.075	5.9
MW-6	08/16/89	5	<10	<10	<10	<0.025	0.057	220	<0.075	5.6
MW-6	08/16/89	10	<10	<10	<10	<0.025	<0.025	<50	<0.075	4.3
MW-7	08/15/89	5	<10	<10	<10	<0.025	0.040	<50	<0.075	9.8
MW-7	08/15/89	10	<10	<10	<10	<0.025	<0.025	<50	<0.075	3.7
MW-8	08/15/89	5	<10	<10	<10	<0.025	<0.025	<50	<0.075	5.1
MW-8	08/15/89	10	<10	<10	<10	<0.025	<0.025	<50	<0.075	2.6
MW-9	11/15/89	5	<1	<1	10	<0.0025	0.013	NA	<0.0025	170
MW-10	11/16/89	5	<1	<1	240	<0.0025	0.049	NA	<0.0025	120
MW-10	11/16/89	9	<1	380	3.1	<0.0025	<0.0025	NA	<0.0025	3.1

NOTES:

* Sample contains higher boiling hydrocarbons not characteristic with gasoline.
** Composite sample.
NA Not analyzed.

TABLE 4: WELL INSTALLATION INFORMATION

Shell Oil Company
630 High Street
Oakland, California

Well No.	Date Drilled	Well Diameter (inches)	Initial Water Table (ft. bgs)	Static Water Table (ft. bgs)	Total Depth of Well (ft. bgs)	Screen (ft. bgs)	Bentonite Seal (ft. bgs)	Grout Seal (ft. bgs)
MW-1	4/25/89	4	10.0	10.43	20	13 - 9	9 - 6	6 - 0
MW-2	4/25/89	4	14.5	11.67	25	20 - 10	10 - 8	8 - 0
MW-3	4/26/89	4	11.5	10.36	20	17 - 8	8 - 6	6 - 0
MW-4	4/26/89	4	10.0	10.91	22	17 - 7	7 - 6	6 - 0
MW-5	08/17/89	4	12.0	11.34	18	8 - 18	5 - 7	1 - 5
MW-6	08/16/89	4	15.0	10.58	20	10 - 20	7 - 9	1 - 7
MW-7	08/15/89	4	17.5	9.76	20	10 - 20	7 - 9	1 - 7
MW-8	08/15/89	4	9.0	9.01	21	9 - 21	6 - 8	1 - 6
MW-9	11/15/89	4	10.0	11.52	12	6 - 12	4 - 5	1 - 4
MW-10	11/16/89	4	11.0	9.55	13	7 - 13	5 - 6	1 - 5

NOTES:

ft bgs feet below ground surface

TABLE 5. RECOMMENDED MIMIMUM VERIFICATION ANALYSES FOR UNDERGROUND TANK LEAKS

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

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

NOTES:

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

TABLE 6. RESULTS OF GROUNDWATER CHEMICAL ANALYSES

Shell Oil Company
630 High Street
Oakland, California

Concentration (mg/L)

Well No.	Date Sampled	TPH-g	TPH-d	TPH-mo	Benzene	Toluene	Ethyl-benzene	Xylenes	Lead
MW-1	05/25/89	11	7.1	1.6	0.0066	0.023	0.023	0.180	NA
MW-1	08/29/89	17	7.2	1.9	0.20	0.18	0.059	0.55	<0.002
MW-1	12/12/89	13	4.4	<0.05	0.250	0.036	0.270	0.380	NA
MW-1	02/20/90	11	3.8	<0.05	0.24	0.034	0.35	0.57	NA
MW-1	04/25/90	9.4	3.8	<0.05	0.17	0.035	0.0086	0.39	NA
MW-1	**08/02/90**	**10.0**	**4.0**	**<0.5**	**0.25**	**0.03**	**0.0055**	**0.38**	**NA**
MW-2	05/25/89	<0.05	<0.05	<0.05	<0.0005	<0.0005	<0.0015	<0.0015	NA
MW-2	08/29/89	<0.05	<0.05	<0.05	<0.0005	<0.0005	<0.0015	<0.0015	<0.002
MW-2	12/11/89	<0.05	0.081	0.22	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-2	02/20/90	<0.05	<0.05	<0.05	<0.0005	0.0006	<0.0005	<0.0005	NA
MW-2[1]									
MW-2	**08/02/90**	**<0.05**	**<0.05**	**<0.5**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**	**NA**
MW-3	05/25/89	1.2	0.40	0.088	<0.0005	<0.0005	<0.0015	<0.0015	NA
MW-3	08/29/89	2.5	0.81	<0.05	0.025	0.01	0.0065	0.0055	<0.002
MW-3	12/15/89	2.8	0.81	<0.05	0.015	0.008	0.004	0.012	NA
MW-3	02/15/90	2.6	0.53	<0.05	0.016	0.0019	0.0076	0.0041	NA
MW-3	04/24/90	2.6	0.48	<0.05	0.028	0.007	0.007	0.015	NA
MW-3	**08/02/90**	**2.6**	**3.6**	**<0.5**	**0.035**	**0.0052**	**0.0091**	**0.0094**	**NA**
MW-4	05/25/89	2.9	1.1	0.29	<0.005	0.0094	<0.0015	0.0034	NA
MW-4	08/29/89	2.9	1.5	0.79	0.029	<0.0005	0.012	0.0016	<0.002
MW-4	12/12/89	4.6	1.0	<0.05	0.170	0.026	0.011	0.020	NA
MW-4	02/13/90	1.9	0.86	<0.05	0.055	0.0091	0.0047	0.0026	NA
MW-4[2]	04/24/90	3.0	1.1	<0.05	0.17	0.020	0.0067	0.016	NA
MW-4	**08/01/90**	**4.2**	**1.0**	**<0.5**	**0.22**	**0.015**	**0.0093**	**0.018**	**NA**
MW-5	08/30/89	1.4	0.30	<0.05	0.0049	0.00079	0.0056	0.0068	<0.002
MW-5	12/05/89	1.4	0.33	<0.05	0.0049	0.0038	0.0091	0.008	NA
MW-5	02/15/90	<0.05	0.18	<0.05	0.0042	0.00076	0.0024	0.0033	NA
MW-5	04/24/90	0.42	0.16	<0.05	0.0056	0.001	0.0006	0.0041	NA
MW-5	**08/02/90**	**0.88**	**0.22**	**<0.5**	**0.013**	**0.002**	**0.0041**	**0.0081**	**NA**
MW-6	08/29/89	<0.05	0.32	0.45	<0.0005	<0.0005	<0.0015	<0.0015	<0.002
MW-6	12/05/89	<0.05	0.60	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-6	02/15/90	<0.05	0.55	<0.05	<0.0005	<0.0005	<0.0005	0.0045	NA
MW-6	04/23/90	0.18	1.2	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-6	**08/02/90**	**<0.05**	**0.90**	**<0.5**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**	**NA**

NOTES:

Bold Samples analyzed during Q3/90
NA Not Analyzed
BTEX analyses by GCMS (EPA Method 624)
[1] MW-2 analyzed semi-annually, next analyses Q3/90.
[2] Sample dilution factor = 10

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

Shell Oil Company
630 High Street
Oakland, California

Concentration (mg/L)

Well No.	Date Sampled	TPH-g	TPH-d	TPH-mo	Benzene	Toluene	Ethyl-benzene	Xylenes	Lead
MW-7	08/29/89	<0.05	<0.05	<0.05	<0.0005	<0.0005	<0.0015	<0.0015	<0.002
MW-7	12/5/89	<0.05	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-7	02/13/90	<0.05	<0.05	<0.05	<0.0005	0.00056	<0.0005	<0.0005	NA
MW-7	04/24/90	<0.05	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-7	**08/01/90**	**<0.05**	**<0.05**	**<0.05**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**	**NA**
MW-8	08/29/89	<0.05	<0.05	<0.05	<0.0005	<0.0005	<0.0015	<0.0015	<0.002
MW-8	12/11/89	<0.05	<0.05	0.0011	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-8	02/13/90	<0.05	<0.05	<0.05	<0.0005	0.00056	<0.0005	<0.0005	NA
MW-8	04/23/90	0.18	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-8	**08/01/90**	**<0.05**	**<0.05**	**<0.5**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**	**NA**
MW-9	12/13/89*	<0.05	0.23	0.54	<0.0044	<0.006	<0.0072	<0.005	NA
MW-9	02/20/90	<0.05	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-9	04/24/90	<0.05	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-9	**08/02/90**	**<0.05**	**<0.05**	**<0.05**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**	**NA**
MW-10	12/13/89*	<0.05	0.11	0.30	<0.0044	<0.006	<0.0072	<0.005	NA
MW-10	02/20/90	<0.05	0.06	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-10[3]	04/25/90	<0.05	NA	NA	<0.0005	<0.0005	<0.0005	<0.0005	NA
MW-10	**08/02/90**	**<0.05**	**<0.05**	**<0.5**	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**	**NA**

NOTES:

*
NA Not Analyzed
BTEX analyses by GCMS (EPA Method 624)
[1] MW-2 analyzed semi-annually
[2] Sample dilution factor = 10
Bold Samples analyzed during Q3/90
[3] TPH-d and TPH-mo analyses omitted accidently next analyses Q3/90

TABLE 7. GROUNDWATER MONITORING INFORMATION

Shell Oil Company
630 High Street
Oakland, California

Well No.	Date Monitored	Depth to Water (ft bgs)	Petroleum Odor In Water	Floating Product Thickness (inches)	Comments
MW-1	05/25/89	10.43	Yes	None	Gray sheen
El. 99.31	08/29/89	10.94	Yes	None	Sheen
	12/5/89	10.32	Yes	None	No sheen
	02/20/90	9.94	Yes	None	None
	04/23/90	10.50	Strong	None	Light sheen
	08/01/90	**10.50**	**—**	**None**	**Slight sheen**
MW-2	05/25/89	11.63	None	None	No sheen
El. 101.11	08/29/89	12.62	None	None	No sheen
	12/5/89	11.83	None	None	No sheen
	02/20/90	11.50	None	None	None
	04/23/90	11.76			No sample taken
	08/01/90	**11.98**	**None**	**None**	**Clear**
MW-3	05/25/89	10.43	None	None	No sheen
El. 99.47	08/29/89	10.90	None	None	No sheen
	12/5/89	10.46	Yes	None	No sheen
	02/01/90	10.15	None	None	None
	04/23/90	10.43	Slight	None	
	08/01/90	**10.54**	**Slight**	**None**	**Clear**
MW-4	05/25/89	10.72	Yes	None	Sheen
El. 99.43	08/29/89	11.28	Yes	None	No sheen
	12/5/89	10.53	Yes	None	No sheen
	02/13/90	10.15	Yes	None	None
	04/23/90	10.65	None	None	None
	08/01/90	**10.87**	**None**	**None**	**Clear**
MW-5	08/30/89	11.38	Yes	None	No sheen
El. 99.91	12/5/89	11.27	Yes	None	No sheen
	02/01/90	10.81	Yes	None	None
	04/23/90	11.06	Slight	None	Clear
	08/01/90	**11.29**	**Slight**	**None**	**Clear**
MW-6	08/29/89	10.59	Yes	None	No sheen
El. 98.56	12/5/89	8.23	None	None	No sheen
	02/01/90	9.43	None	None	None
	04/23/90	9.97	None	None	None
	08/01/90	**10.14**	**None**	**None**	**Solvent odor**

NOTES:

Bold Samples analyzed in Quarter 3, 1990
ft bgs feet below ground surface
All elevations are tied into a temporary benchmark elevation of 100.00 feet

TABLE 7 (cont'd) GROUNDWATER MONITORING INFORMATION

Shell Oil Company
630 High Street
Oakland, California

Well No.	Date Monitored	Depth to Water (ft bgs)	Petroleum Odor In Water	Floating Product Thickness (inches)	Comments
MW-7	8/29/89	9.75	None	None	No sheen
El. 97.64	12/5/89	9.29	None	None	No sheen
	02/13/90	8.65	None	None	None
	04/23/90	9.28	None	None	None
	08/01/90	**9.28**	**None**	**None**	**Clear**
MW-8	8/29/89	9.02	None	None	No sheen
El. 97.14	12/5/89	9.87	None	None	No sheen
	02/13/90	7.73	None	None	None
	04/23/90	7.83	None	None	Clear
	04/23/90	9.28	None	None	Clear
	08/01/90	**8.44**	**None**	**None**	**Clear**
MW-9	12/5/89	11.52	None	None	No sheen
El. 99.73	02/20/90	7.94	None	None	
	04/23/90	8.15	None	None	Clear
	08/01/90	**8.33**	**None**	**None**	**Clear**
MW-10	12/5/89	9.55	None	None	No sheen
El. 99.00	02/20/90	10.69	None	None	None
	04/23/90	10.00	None	None	Clear
	08/01/90	**9.99**	**None**	**None**	**Clear**

NOTES:

Bold Samples analyzed in Quarter 3, 1990
ft bgs feet below ground surface
All elevations are tied into a temporary benchmark elevation of 100.00 feet

TABLE 8. GEOMETRIC DESCRIPTION OF WELLS

Shell Oil Company Facility
630 High Street
Oakland, California

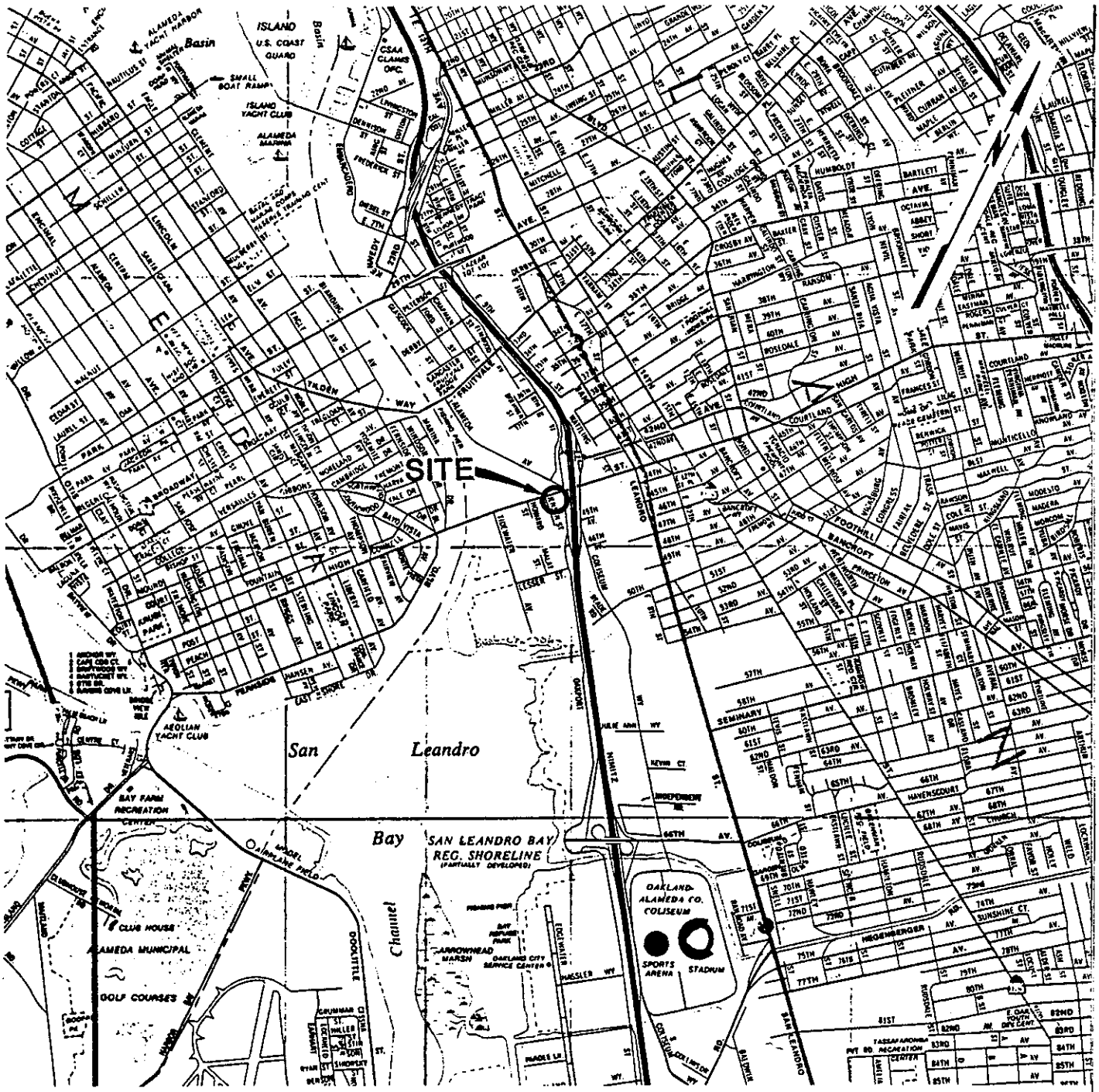
Well	H (ft)	Le (ft)	Lw (ft)	rc (ft)	rw (ft)	Le/rw	Lw/rw
MW-5	6.66	10	6.66	0.167	0.5	20	13.32
MW-6	9.42	10	9.42	0.167	0.5	20	18.84
MW-7	10.24	10	10.24	0.167	0.5	20	20.48
MW-8	11.99	12	11.99	0.167	0.5	24	23.98
MW-9	3.54	6	3.54	0.167	0.5	12	7.08

TABLE 9. HYDRAULIC CONDUCTIVITY AND TRANSMISSIVITY

Shell Oil Company Facility
630 High Street
Oakland, California

Well	K (ft/sec)	K gal/day/ft^2	T gal/day/ft
MW-5	1.13×10^{-5}	7.30	48.6
MW-6	1.81×10^{-5}	11.70	110.2
MW-7	6.25×10^{-6}	4.04	41.4
MW-8	4.00×10^{-5}	25.83	309.7
MW-9	3.14×10^{-6}	2.03	7.2
Average	1.58×10^{-5}	10.2	103.4

DRAWINGS



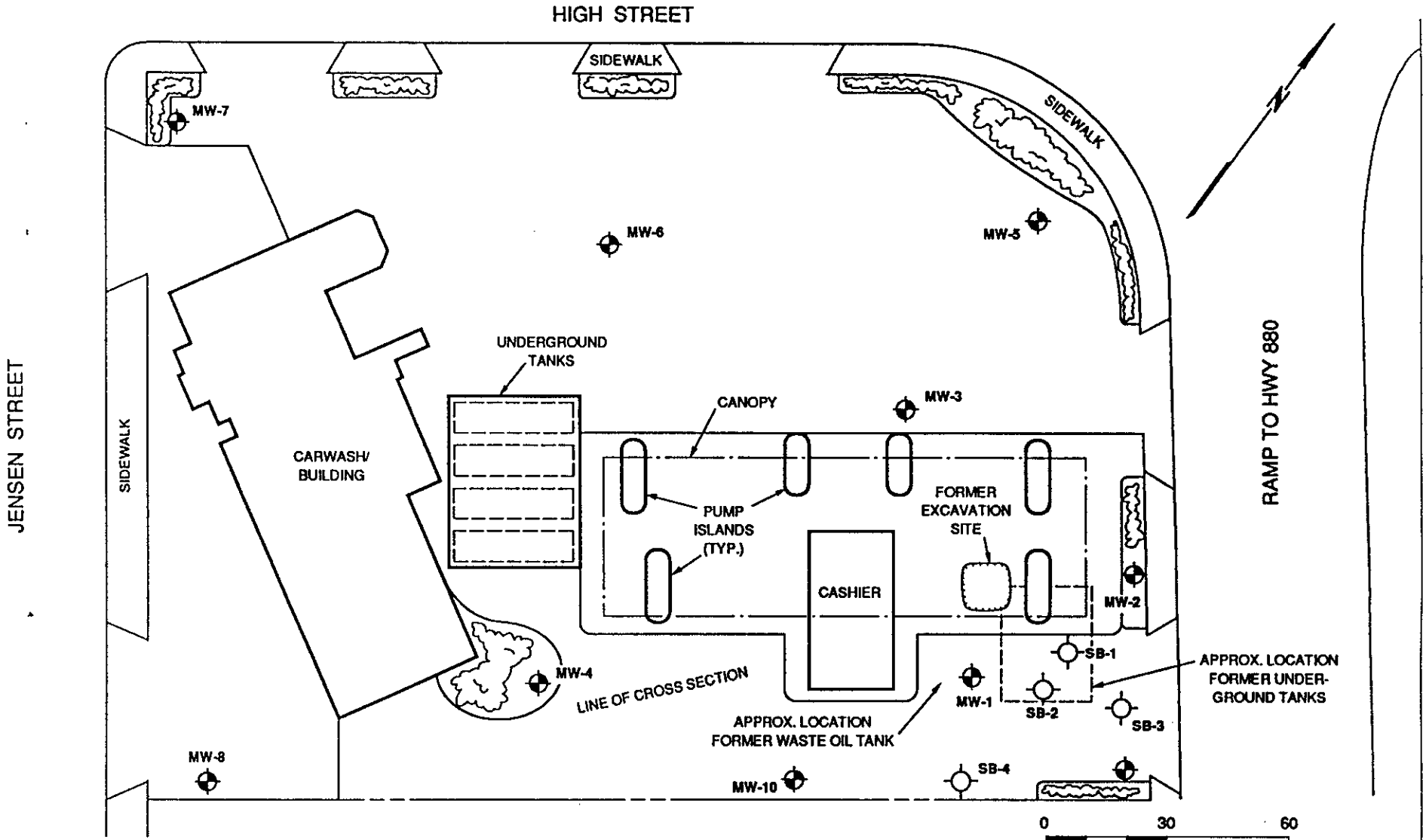
SOURCE: California State Automobile Association

SITE LOCATION MAP

SHELL OIL COMPANY
630 High Street
Oakland, California

Scale	AS SHOWN
Project No.	88-44-369-20
Prepared by	KGC
Date	6/5/90
Checked by	RMB
Drawing No.	1
Approved by	CRC

Converse Environmental West



Base Map: Surveyed with EDM, Converse 1989.

LEGEND

SB-1 SOIL BORING (locations approximate)

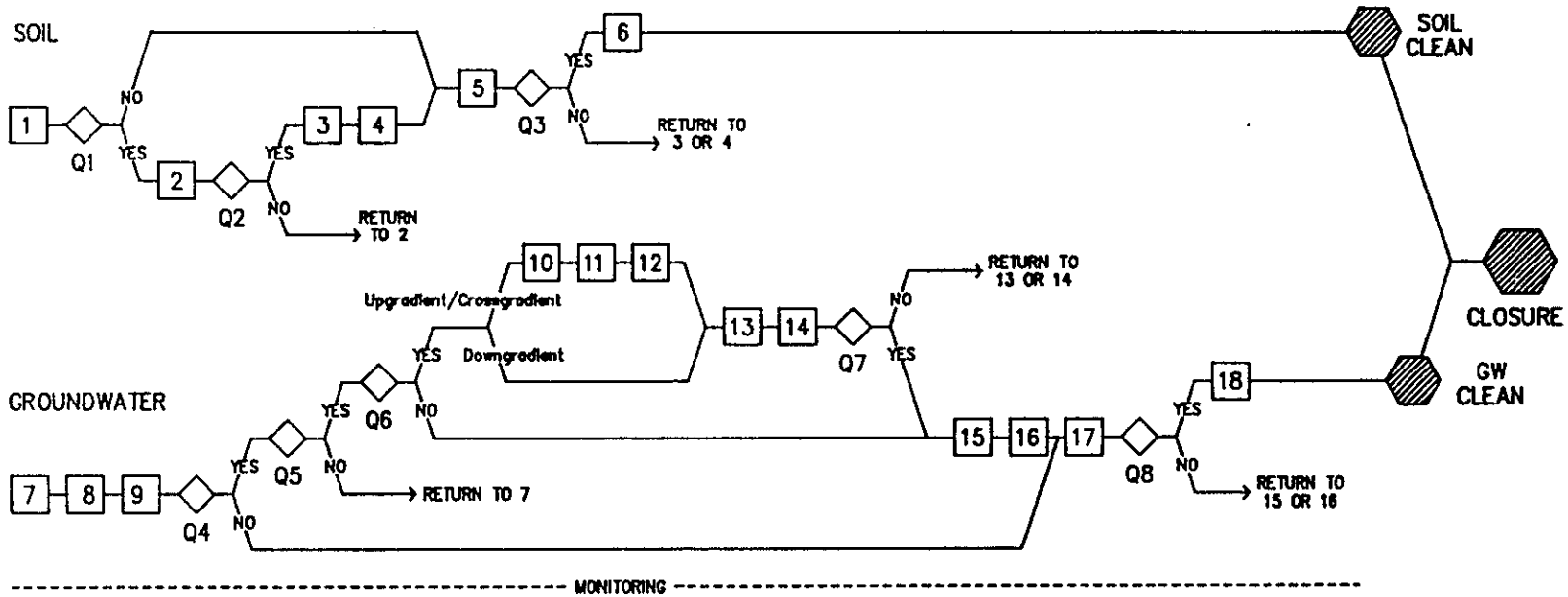
MW-1 GROUNDWATER MONITORING WELL

PLOT PLAN

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental West

Scale: AS SHOWN	Project No.: 88-44-369-20
Prepared by: DEN/LQL	Date: 6-5-90
Checked by: RMB	Drawing No.: 2
Approved by: CRC	



TASKS

Program 1: Onsite Soil Investigation/Remediation

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

Program 2: Onsite Groundwater Investigation

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

Program 3: Offsite Groundwater Investigation (if needed)

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

Program 4: Groundwater Remediation (if needed)

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

QUESTIONS

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

Q2: Is soil characterized?

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

Q4: Is groundwater actionable?

Q5: Is groundwater characterized onsite?

Q6: Does groundwater pollution extend offsite?

Q7: Is groundwater characterized offsite?

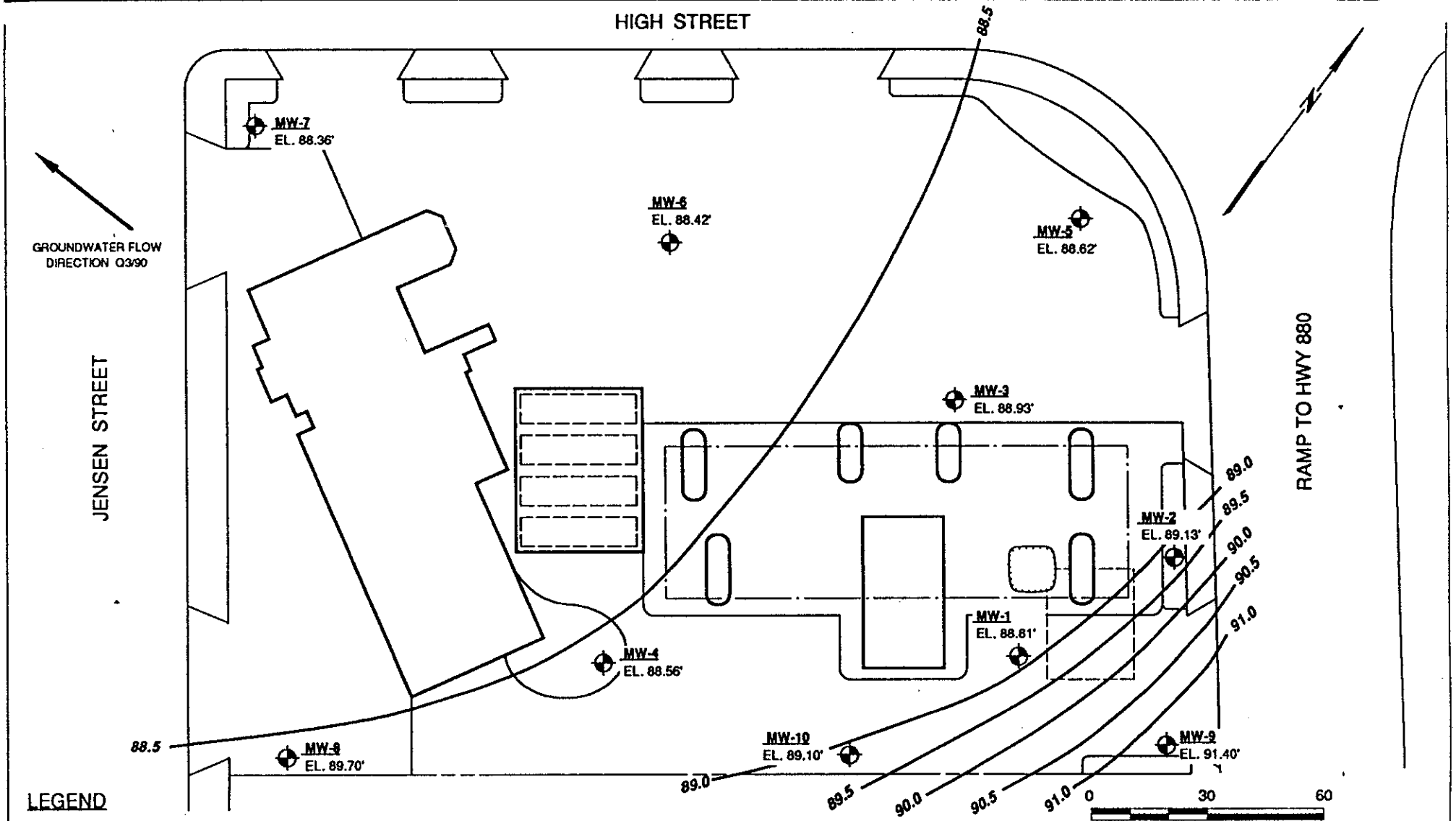
Q8: Is the environmental risk acceptably low for contaminants proposed to be left in groundwater?

CRITICAL PATH DIAGRAM

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental West

Scale: AS SHOWN	Project No.: 88-44-369-20
Prepared by: DEN	Date: 6/5/90
Checked by: RMB	Drawing No.: 3
Approved by: CRC	



Base Map: Surveyed with EDM, Converse 1989.

LEGEND

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

MW-1 GROUNDWATER MONITORING WELL SHOWING GROUNDWATER ELEVATION

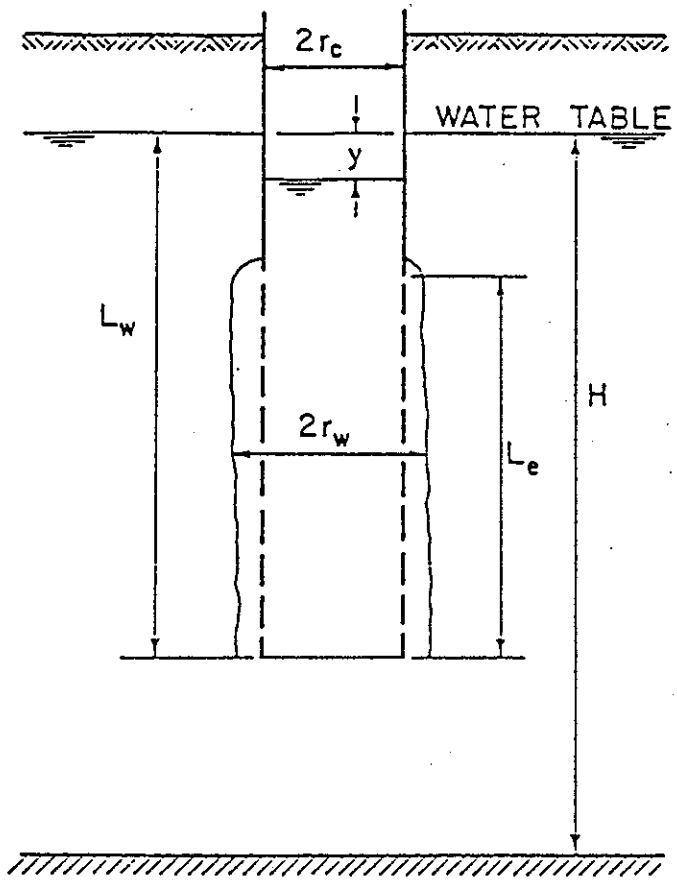
NOTE: GROUNDWATER ELEVATIONS GIVEN IN FEET ABOVE MEAN SEA LEVEL

GROUNDWATER CONTOUR MAP Q3/90

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental West

Scale	AS SHOWN
Prepared by	CJD
Checked by	RMB
Approved by	CRC
Project No.	88-44-369-20
Date	9-20-90
Drawing No.	4



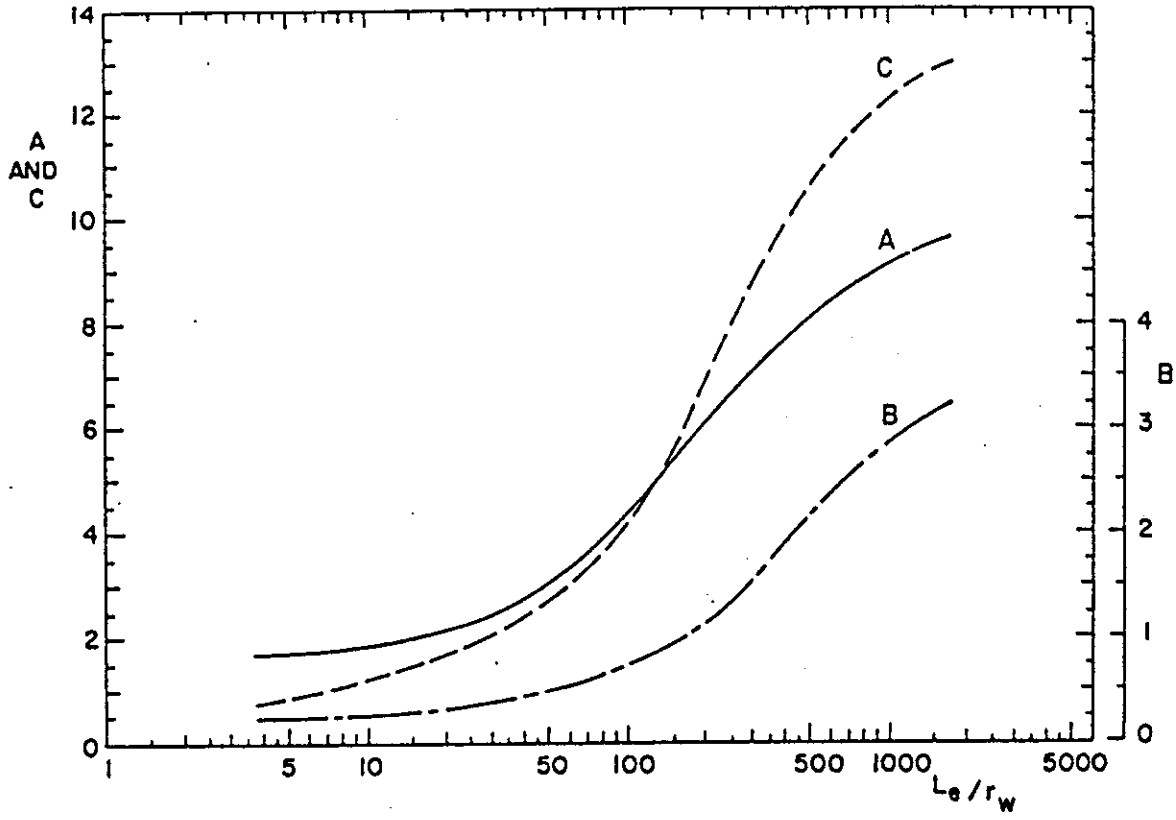
SOURCE: BOUWER, 1989

GEOMETRY AND SYMBOLS FOR SLUG TEST

SHELL OIL COMPANY
630 High Street
Oakland, California

Scale	NO SCALE
Project No.	88-44-369-20
Prepared by	CJD
Date	9/20/90
Checked by	RMB
Drawing No.	5
Approved by	CRC

Converse Environmental West



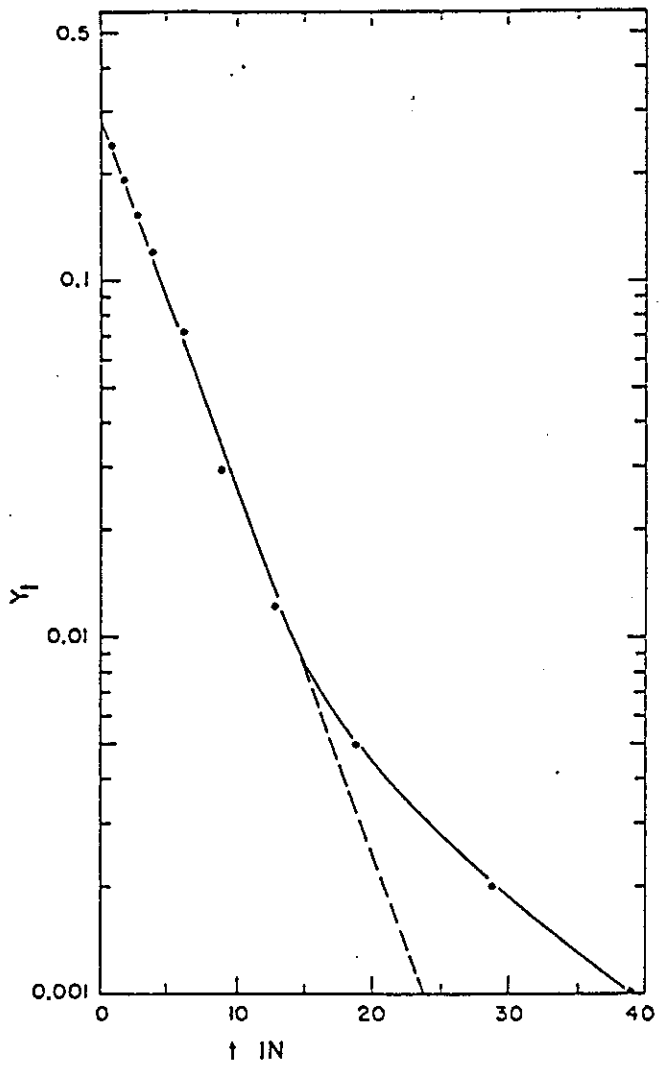
SOURCE: BOUWER and RICE, 1976

DIMENSIONLESS PARAMETERS A, B, AND C, AS A FUNCTION OF L_e/r_w

SHELL OIL COMPANY
630 High Street
Oakland, California

Scale	NO SCALE
Project No.	88-44-369-20
Prepared by	CJD
Date	9/20/90
Checked by	RMB
Drawing No.	6
Approved by	CRC

Converse Environmental West



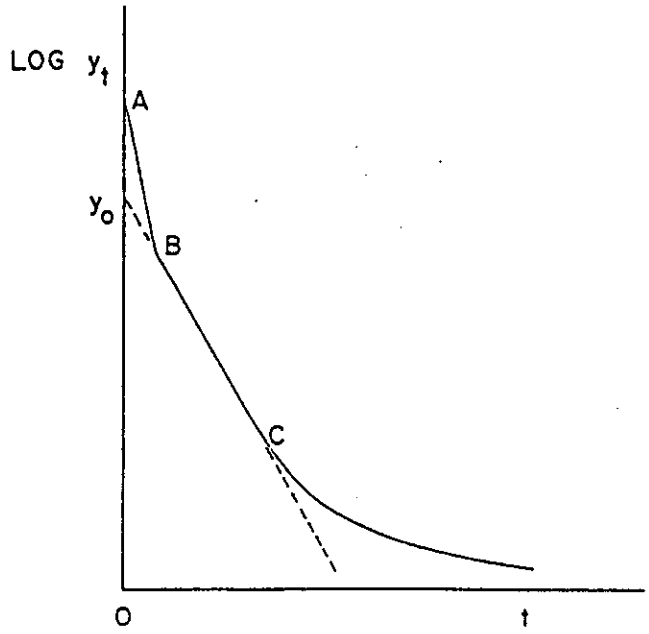
SOURCE: BOUWER, 1989

GRAPH OF ln (y_t) VERSUS t FOR A SLUG TEST

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental West

Scale	NO SCALE
Project No.	88-44-369-20
Prepared by	CJD
Date	9/20/90
Checked by	RMB
Drawing No.	7
Approved by	CRC



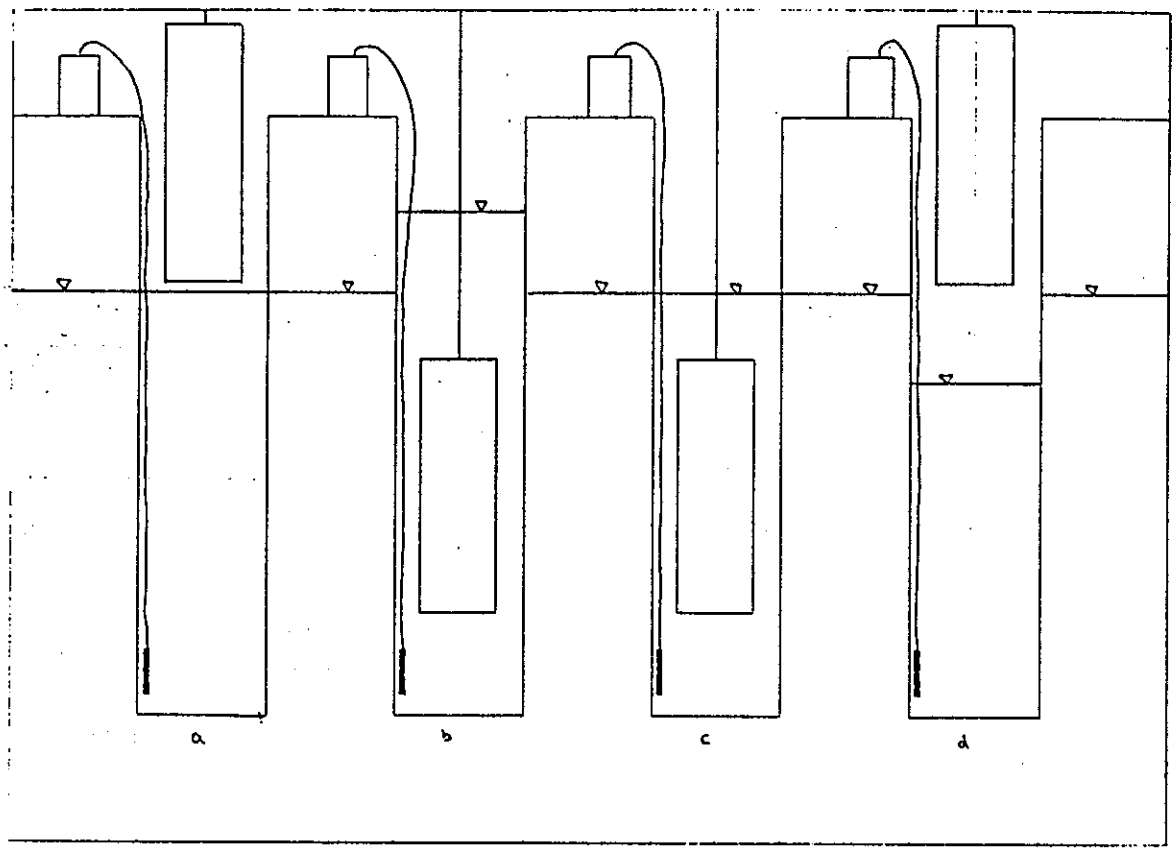
SOURCE: BOUWER, 1989

SCHEMATIC OF DOUBLE STRAIGHT LINE EFFECT

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental West

Scale	NO SCALE
Project No.	88-44-369-20
Prepared by	CJD
Date	9/20/90
Checked by	RMB
Drawing No.	8
Approved by	CRC

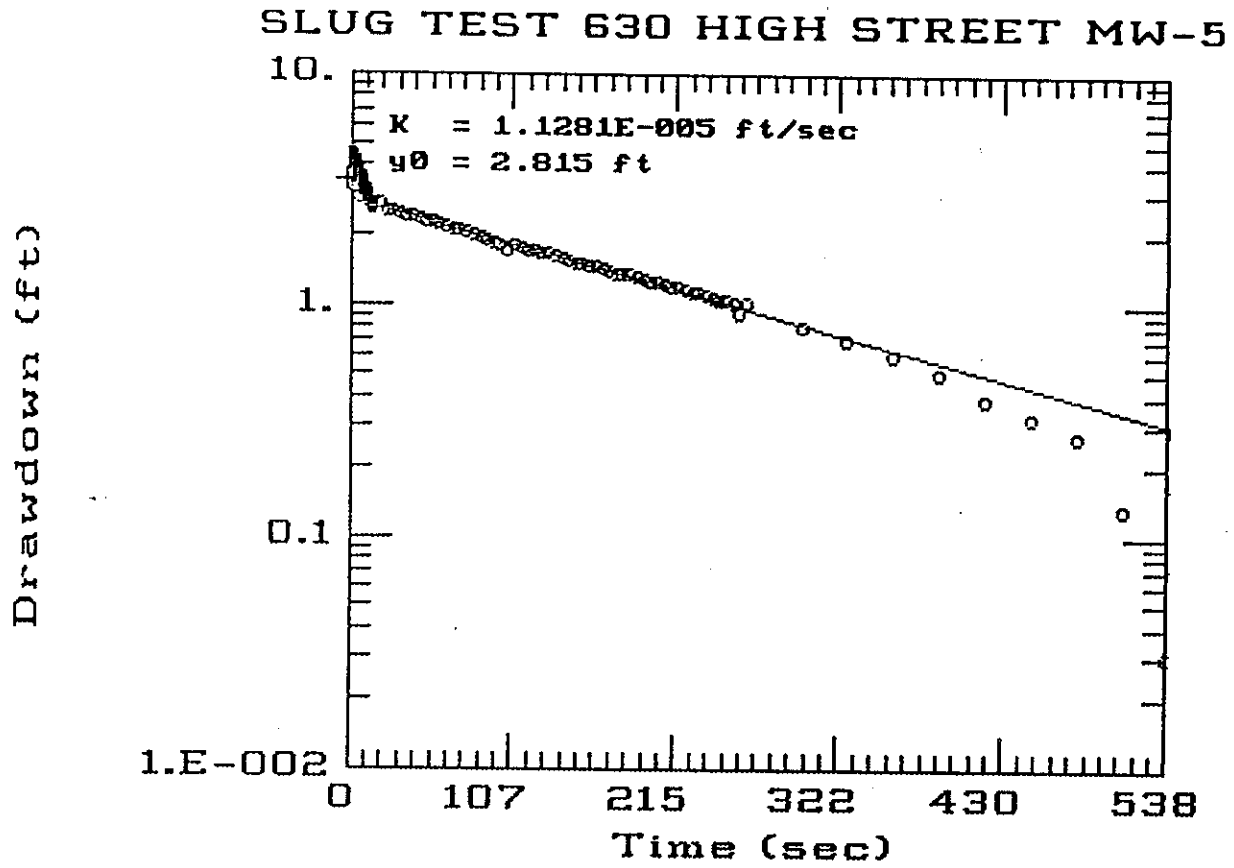


SCHEMATIC OF TEST PROCEDURE

SHELL OIL COMPANY
630 High Street
Oakland, California

Scale	NO SCALE
Prepared by	CJD
Checked by	RMB
Approved by	CRC
Project No.	88-44-369-20
Date	9/20/90
Drawing No.	9

Converse Environmental West

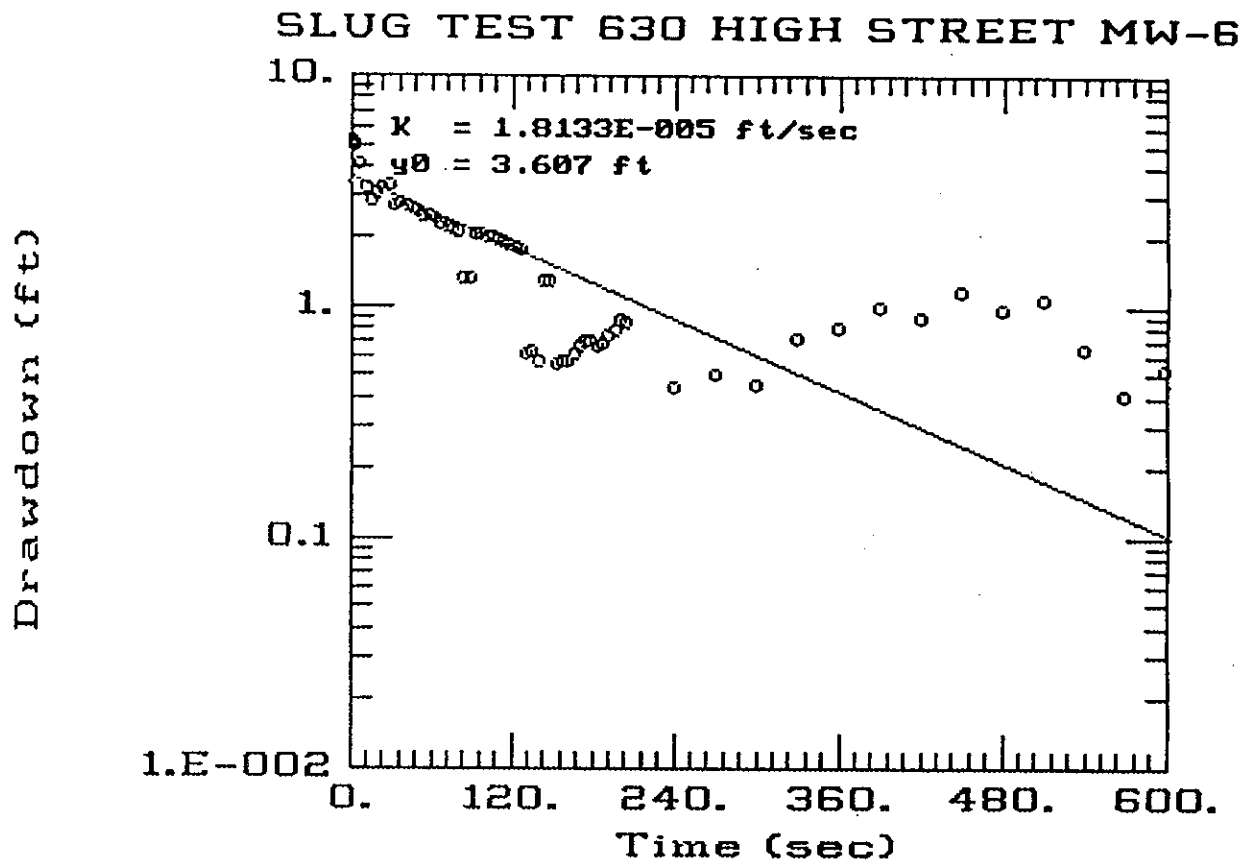


SLUG TEST FOR MW-5

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental West

Scale	NO SCALE
Prepared by	CJD
Checked by	RMB
Approved by	CRC
Project No.	88-44-369-20
Date	9-20-90
Drawing No.	10

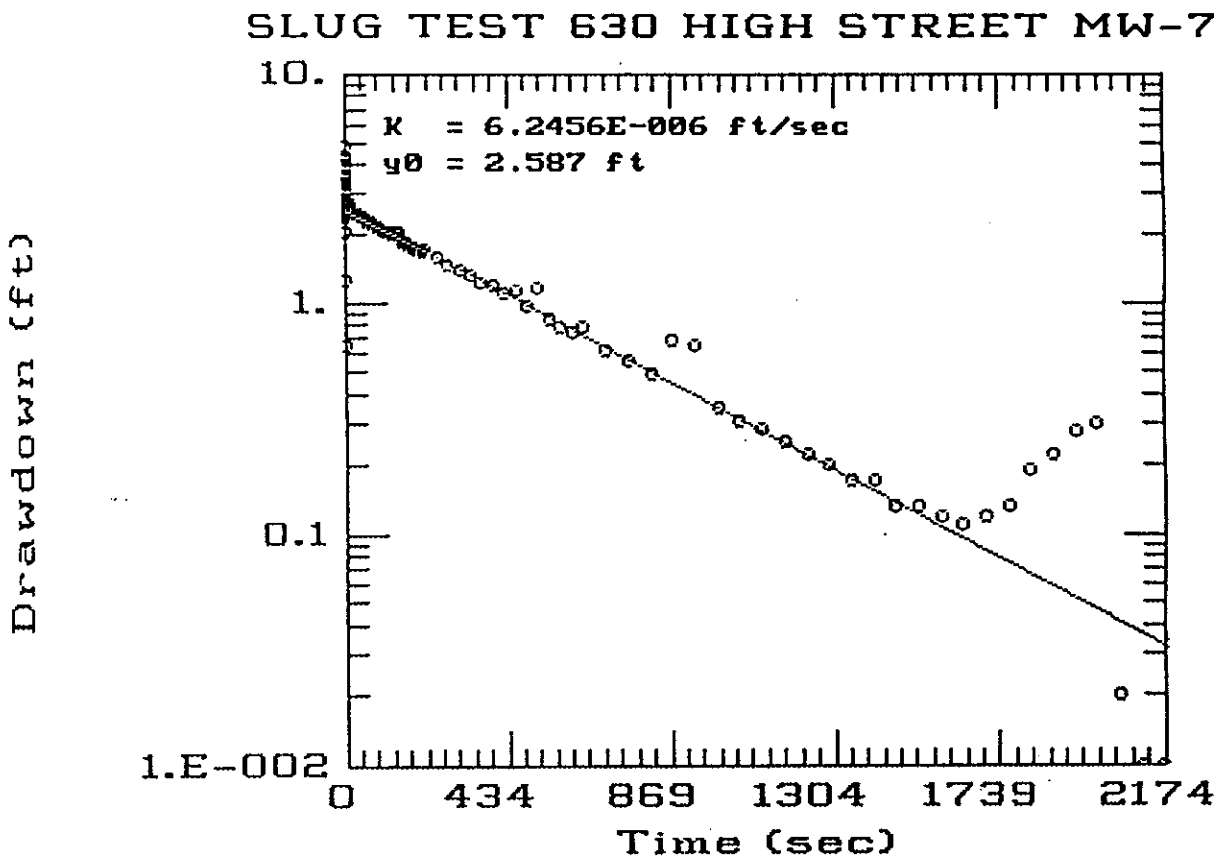


SLUG TEST FOR MW-6

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental West

Scale	NO SCALE
Project No.	88-44-369-20
Prepared by	CJD
Date	9-20-90
Checked by	RMB
Drawing No.	11
Approved by	CRC

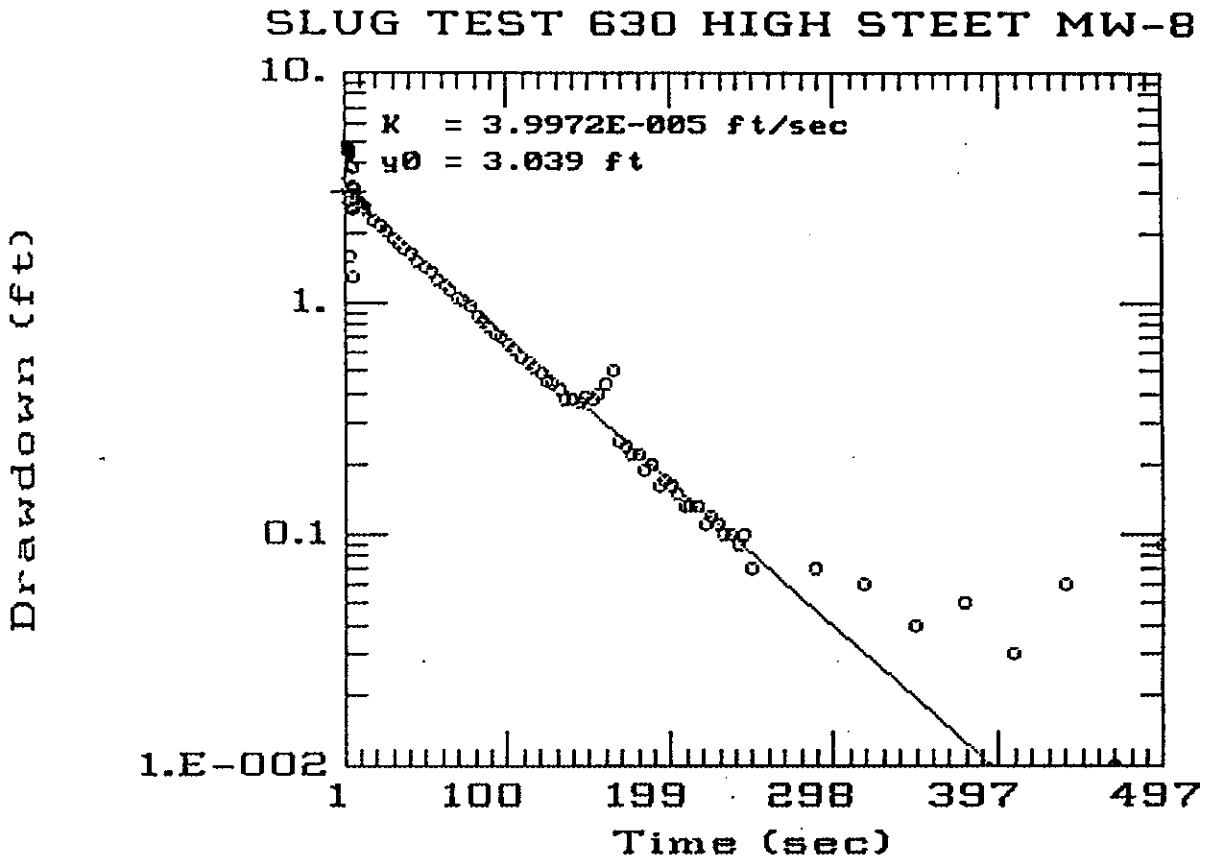


SLUG TEST FOR MW-7

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental West

Scale	NO SCALE
Project No.	88-44-369-20
Prepared by	CJD
Date	9-20-90
Checked by	RMB
Drawing No.	12
Approved by	CRC

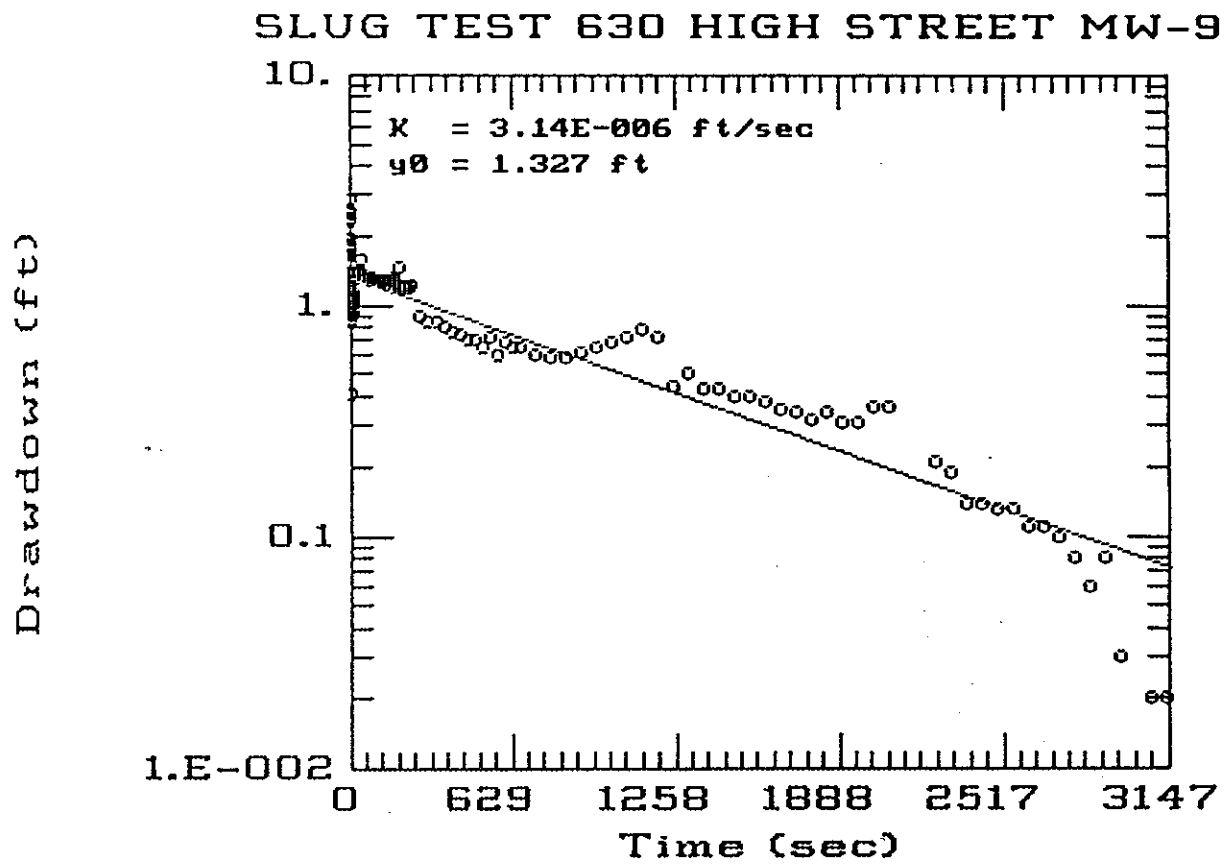


SLUG TEST FOR MW-8

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental West

Scale	NO SCALE
Prepared by	CJD
Checked by	RMB
Approved by	CRC
Project No.	88-44-369-20
Date	9-20-90
Drawing No.	13



SLUG TEST FOR MW-9

SHELL OIL COMPANY
630 High Street
Oakland, California

Converse Environmental West

Scale	NO SCALE
Project No.	88-44-369-20
Prepared by	CJD
Date	9-20-90
Checked by	RMB
Drawing No.	14
Approved by	CRC

APPENDIX A

SITE DESCRIPTION

APPENDIX A

SITE DESCRIPTION

LOCATION

The property is located on the southeast corner of High Street and Jensen Street in Oakland, California. The site is approximately 240 feet long by 180 feet wide.

SETTING

The site is located within the East Bay Plain area of Alameda County. The site lies on Quaternary fluvial deposits, and possibly Quaternary Merritt Sand as well (Hickenbottom and Muir, 1988). The fluvial deposits are composed of unconsolidated, moderately sorted, moderately permeable fine sand, silt, and clayey silt with occasional thin beds of coarse sand (Helley et al., 1979). The fluvial deposits had their origin as fragmented and transported material derived from bedrock uplands and older unconsolidated sediments deposited by flowing water on inactive stream levees primarily during floods (Helley et al., 1988). The Merritt sand is composed of loose, well-sorted, fine-to medium-grained sand with subordinate silt derived chiefly by wind erosion and transport of stream sediments during low sea-level stands (Helley et al., 1979). Beneath the fluvial deposits and the Merritt sand lie unconsolidated older alluvial deposits total depth of approximately 700 feet.

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

and Muir, 1988). Groundwater pumpage from wells is, at the present time, probably the main element of groundwater discharge, although evapo/transpiration, groundwater discharge to streams, underflow to San Francisco Bay, and spring discharge are also contributing factors (Hickenbottom and Muir, 1988).

The quality of groundwater in the East Bay Plain is generally good. Total dissolved solids concentrations are generally in the range 300 to 1000 mg/l. Toxic materials have, however, been introduced into the shallow aquifers in the East Bay Plain in a number of locations. These toxic materials include petroleum products, lead and chromium, organic solvents such as acetone and benzene, and many others (Hickenbottom and Muir, 1988). In addition, salt-water intrusion has occurred on a limited basis into the Merritt Sand in the Oakland and Alameda areas (Hickenbottom and Muir, 1988).

Topographic maps of the area indicate that the site vicinity is nearly flat.

There are no major surface drainages in the area. The site is located approximately 1/4 mile east of the tidal canal separating Oakland from Alameda. Water from the tidal canal flows into and out of San Leandro Bay and Oakland Inner Harbor, both of which open into San Francisco Bay.

APPENDIX B

CHRONOLOGICAL SUMMARY

CHRONOLOGICAL SUMMARY

The following chronological summary is based on information provided to Converse Environmental West (CEW) by Shell Oil Company (Shell). CEW was not provided with certain information related to the construction, operational, and environmental history of the site. 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 site.

Date	Description of Activity
01/85	Re-modernization of gas station. Armor Norman dismantled and removed all fuel dispensing facilities and excavated certain areas near former pump islands, product lines and areas which smelled of gasoline.
01/26/89	Blaine Technical Services collected and analyzed (10) excavation soil samples. The inspector from the Alameda county Health Department specified sampling locations. Soil were analyzed for TPH-g, BTEX and organic lead.
02/03/89	Blaine Tech Services collected and analyzed soil samples in areas of product dispensing pump islands after additional excavation in these areas and in areas of former waste oil and gasoline tank pits (sample No. 10 - 75 ppm and No. 12 - 600 ppm TPH-g).
02/03/89	Further excavation in former waste oil tank pit. Soil and groundwater samples were collected and analyzed in the area around sample no. 12 of February 3, 1989 sampling event. These soil sample contained less than 50 ppm TPH-d. Groundwater sample no. 3 from that area contained 1,800 ppm TPH-g and 200 ppm TPH-d.
02/24/89	Alameda County Environmental Health Department notified Shell that site conditions indicated a confirmed release, which required an investigation Work Plan within 25 days of the letter date.
03/89	Shell transferred project to CEW.
03/20/89	CEW submitted Revised Work Plan to agencies.
04/26/89	CEW installed wells MW-1 to MW-4 and soil borings SB-1 and SB-2.
05/19/89	CEW developed wells MW-1 through MW-4.
05/25/89	CEW surveyed site and well head elevations (MW-1 through MW-4) to arbitrary
05/26/89	CEW sampled groundwater from wells MW-1 through MW-4.
08/15/89	CEW installed wells MW-5 through MW-8 and boring SB-3.
08/22/89	CEW surveyed wells MW-5 through MW-8 to arbitrary datum.

CHRONOLOGICAL SUMMARY (cont'd)

Date	Description of Activity
08/29/89	CEW sampled and developed wells MW-5 through MW-8.
10/17/89	Loma Prieta Earthquake struck.
11/15/89	CEW installed wells MW-9 and MW-10 and Boring SB-4.
11/22/89	CEW developed wells MW-9 and MW-10.
12/11/89	CEW sampled and surveyed wells MW-9 and MW-10.
01/31/90	CEW submitted Addendum to Quarterly Report Q4/89.
02/13,02/14, 02/15 & 02/20/90	CEW sampled and surveyed wells MW-1 through MW-10, performed slug tests on wells MW-5 through MW-9.
04/23/90 - 04/25/90	CEW sampled wells MW-1 through MW-10. CEW applied for offsite well permit with the City of Oakland.
08/01/90 & 08/02/90	**CEW sampled wells MW-1 through MW-10.**

Boldface items were conducted during Quarter 3 1990.

APPENDIX C

LABORATORY REPORTS AND CHAIN-OF-CUSTODY FORMS

NATIONAL ENVIRONMENTAL TESTING, INC.

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

RECEIVED

AUG 17 1990

CONVERSE ENVIRONMENTAL

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

Date: 08-14-90
NET Client Acct. No: 18.02
NET Pacific Log No: 3155
Received: 08-03-90 0800

Client Reference Information

SHELL-630 High St., Project: 88-44-369-20

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: 3155

Date: 08-14-90
Page: 2

Ref: SHELL-630 High St., Project: 88-44-369-20

SAMPLE DESCRIPTION: MW-2 08-02-90 1125
LAB Job No: (-59169)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-07-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-07-90	
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		08-07-90	
DATE ANALYZED		08-08-90	
METHOD GC FID/3510		--	
as Diesel	0.05	ND	mg/L
as Motor Oil	0.5	ND	mg/L

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 3155

Date: 08-14-90
Page: 3

Ref: SHELL-630 High St., Project: 88-44-369-20

SAMPLE DESCRIPTION: MW-9 08-02-90 1145
LAB Job No: (-59170)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-07-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-07-90	
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		08-07-90	
DATE ANALYZED		08-08-90	
METHOD GC FID/3510		--	
as Diesel	0.05	ND	mg/L
as Motor Oil	0.5	ND	mg/L

Ref: SHELL-630 High St., Project: 88-44-369-20

SAMPLE DESCRIPTION: MW-1 08-02-90 1215
LAB Job No: (-59171)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		10	
DATE ANALYZED		08-08-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	10	mg/L
METHOD 602		--	
DILUTION FACTOR *		10	
DATE ANALYZED		08-08-90	
Benzene	0.5	250	ug/L
Ethylbenzene	0.5	5.5	ug/L
Toluene	0.5	30	ug/L
Xylenes, total	0.5	380	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		10	
DATE EXTRACTED		08-07-90	
DATE ANALYZED		08-08-90	
METHOD GC FID/3510		--	
as Diesel	0.05	4.0	mg/L
as Motor Oil	0.5	ND	mg/L

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 3155

Date: 08-14-90
Page: 5

Ref: SHELL-630 High St., Project: 88-44-369-20

SAMPLE DESCRIPTION: MW-10 08-02-90 1240
LAB Job No: (-59172)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-07-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-07-90	
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		08-07-90	
DATE ANALYZED		08-08-90	
METHOD GC FID/3510		--	
as Diesel	0.05	ND	mg/L
as Motor Oil	0.5	ND	mg/L

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 3155

Date: 08-14-90
Page: 6

Ref: SHELL-630 High St., Project: 88-44-369-20

SAMPLE DESCRIPTION: MW-3 08-02-90 1350
LAB Job No: (-59173)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		10	
DATE ANALYZED		08-08-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	2.6	mg/L
METHOD 602		--	
DILUTION FACTOR *		10	
DATE ANALYZED		08-08-90	
Benzene	0.5	35	ug/L
Ethylbenzene	0.5	9.1	ug/L
Toluene	0.5	5.2	ug/L
Xylenes, total	0.5	9.4	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		08-07-90	
DATE ANALYZED		08-08-90	
METHOD GC FID/3510		--	
as Diesel	0.05	3.6	mg/L
as Motor Oil	0.5	ND	mg/L

Ref: SHELL-630 High St., Project: 88-44-369-20

SAMPLE DESCRIPTION: MW-5 08-02-90 1415
LAB Job No: (-59174)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-07-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	0.88	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-07-90	
Benzene	0.5	13	ug/L
Ethylbenzene	0.5	4.1	ug/L
Toluene	0.5	2.0	ug/L
Xylenes, total	0.5	8.1	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		08-07-90	
DATE ANALYZED		08-08-90	
METHOD GC FID/3510		--	
as Diesel	0.05	0.22	mg/L
as Motor Oil	0.5	ND	mg/L

Ref: SHELL-630 High St., Project: 88-44-369-20

SAMPLE DESCRIPTION: MW-4 08-01-90 1345
LAB Job No: (-59175)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		25	
DATE ANALYZED		08-08-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	4.2	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-08-90	
Benzene	0.5	220	ug/L
Ethylbenzene	0.5	9.3	ug/L
Toluene	0.5	15	ug/L
Xylenes, total	0.5	18	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		08-08-90	
DATE ANALYZED		08-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	1.0	mg/L
as Motor Oil	0.5	ND	mg/L

Ref: SHELL-630 High St., Project: 88-44-369-20

SAMPLE DESCRIPTION: Field Blank 08-01-90 1330
LAB Job No: (-59176)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-07-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-07-90	
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		08-08-90	
DATE ANALYZED		08-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	ND	mg/L
as Motor Oil	0.5	ND	mg/L

Ref: SHELL-630 High St., Project: 88-44-369-20

SAMPLE DESCRIPTION: MW-8 08-01-90 1420
LAB Job No: (-59177)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-07-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-07-90	
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		08-08-90	
DATE ANALYZED		08-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	ND	mg/L
as Motor Oil	0.5	ND	mg/L

Ref: SHELL-630 High St., Project: 88-44-369-20

SAMPLE DESCRIPTION: MW-7 08-01-90 1520
LAB Job No: (-59178)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-07-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-07-90	
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		08-08-90	
DATE ANALYZED		08-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	ND	mg/L
as Motor Oil	0.5	ND	mg/L

Ref: SHELL-630 High St., Project: 88-44-369-20

SAMPLE DESCRIPTION: 90-08-01 08-01-90
LAB Job No: (-59179)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		20	
DATE ANALYZED		08-08-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	3.7	mg/L
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-08-90	
Benzene	0.5	190	ug/L
Ethylbenzene	0.5	5.9	ug/L
Toluene	0.5	12	ug/L
Xylenes, total	0.5	16	ug/L
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		08-08-90	
DATE ANALYZED		08-09-90	
METHOD GC FID/3510		--	
as Diesel	0.05	0.81	mg/L
as Motor Oil	0.5	ND	mg/L

Client Acct: 18.02
Client Name: Converse Consultants
NET Log No: 3155

Date: 08-14-90
Page: 13

Ref: SHELL-630 High St., Project: 88-44-369-20

SAMPLE DESCRIPTION: MW-6 08-02-90 1330
LAB Job No: (-59180)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (WATER)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-07-90	
METHOD GC FID/5030		--	
as Gasoline	0.05	ND	mg/L
as Thinner	0.05	ND	mg/l
METHOD 602		--	
DILUTION FACTOR *		1	
DATE ANALYZED		08-07-90	
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		08-07-90	
DATE ANALYZED		08-08-90	
METHOD GC FID/3510		--	
as Diesel	0.05	0.90	mg/L
as Motor Oil	0.5	ND	mg/L

Ref: SHELL- 630 High St., Project: 88-44-369-20

SAMPLE DESCRIPTION: Trip Blank 08-02-90
LAB Job No: (-59181)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
EXTRACTABLE (WATER)		--	
DILUTION FACTOR *		1	
DATE EXTRACTED		08-07-90	
DATE ANALYZED		08-08-90	
METHOD GC FID/3510		--	
as Diesel	0.05	ND	mg/L
as Motor Oil	0.5	ND	mg/L

Ref: SHELL-630 High St., Project: 88-44-369-20

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Diesel	0.05	mg/L	91	ND	60	79	27
Motor Oil	0.5	mg/L	101	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
Diesel	0.05	mg/L	81	ND	59	62	5.0
Motor Oil	0.5	mg/L	94	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	96	ND	93	100	7.0
Benzene	0.5	ug/L	107	ND	100	107	6.9
Toluene	0.5	ug/L	106	ND	101	107	5.4

COMMENT: Blank Results were ND on other analytes tested.

QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Gasoline	0.05	mg/L	98	ND	90	102	12
Benzene	0.5	ug/L	107	ND	93	100	6.9
Toluene	0.5	ug/L	105	ND	91	96	5.6

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.

AFE 086612
EXP 5440

1 of 2

CONVERSE ENVIRONMENTAL WEST

CHAIN OF CUSTODY RECORD

AM. Robin Brewer

PROJECT NO.: EC-44-369-20

PROJECT NAME / CROSS STREET: 630 HEGIS ST.

SAMPLERS: (Signature) Claudia Brun

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	ANALYSES: TPH-G	BTEX	TPH-D	TPH-MO		PAINT THINNER	REMARKS
MW2	5/2/90	1125			VOA's	3	X	X					
MW2	5/2/90	1125			AMBER LITER	2			X	X			
MW9	5/2/90	1145			VOA'S	3	X	X					
MW9	5/2/90	1145			AMBER LITER	2			X	X			
MW1	5/2/90	1215			VOA'S	3	X	X					
MW1	5/2/90	1215			AMBER LITER	2			X	X			
MW10	5/2/90	1240			VOA'S	3	X	X					
MW10	5/2/90	1240			AMBER LITER	2			X	X			1 Bottle 1/2 FULL WELL "DRY"
MW6	5/2/90	1330			VOA'S	3	X	X				(X)	RUN ALSO PAINT THINNER
MW6	5/2/90	1330			AMBER LITER	2			X	X			
MW3	5/2/90	1350			VOA'S	3	X	X					
MW3	5/2/90	1350			AMBER LITER	2			X	X			
MW5	5/2/90	1415			VOA'S	3	X	X					

DETECTION LIMITS
TPH-G .05 PPM
TPH-D .05 PPM
TPH-MO .05 PPM
BTEX .0005 PPM
S.T.N.T.

RELINQUISHED BY: (Signature) Claudia Brun	DATE: 5/2/90 TIME: 17:00	RECEIVED BY: (Signartue) Jeff Winkler	RELINQUISHED BY: (Signature) Jeff Winkler	DATE: 5/2/90 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 (VIA NCS)		SHIPPED BY: (Signatue)	RECEIVED FOR LAB: (Signature) K Temple	DATE: 5-3-90 TIME: 0800	COURIER FROM AIRPORT: (Signature)

24/L

CONVERSE ENVIRONMENTAL WEST

CHAIN OF CUSTODY RECORD

PROJECT NO.: 98-44-369-20

PROJECT NAME / CROSS STREET : 630 HIGH St

SAMPLERS: (Signature) Charles Bruns

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	ANALYSES: TPH-G	TPH BTEX	TPH-D	TPH-MO			REMARKS
MW 5	8/2/90	1415			NUMBER LITER	2			X	X			
TRIP BLANK	8/2/90				NUMBER LITER	1			X	X			
TRIP BLANK	8/2/90				VOA								FROZE & BROKE

RELINQUISHED BY : (Signature) Charles Bruns	DATE : 8/2/90 TIME : 17:00	RECEIVED BY : (Signartue) Jeff Wickham	RELINQUISHED BY : (Signature) Jeff Wickham	DATE : 8/2/90 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 : (Signature)	DATE : TIME :	RECEIVED BY COURIER : (Signature)
METHOD OF SHIPMENT (VIA NCS)		SHIPPED BY : (Signature)	RECEIVED FOR LAB : (Signature) K Langston	DATE : 8-3-90 TIME : 0800	COURIER FROM AIRPORT : (Signature)

AFE 086672
EXP 5440

CONVERSE ENVIRONMENTAL **WEST**

CHAIN OF CUSTODY RECORD

PM Robin Brewer

PROJECT NO.: 58-44-369-20

PROJECT NAME / CROSS STREET: 630 High St

SAMPLERS (Signature): Charles Brown

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NUMBER OF CONTAINERS	TPH-G	BTEX	TPH-D	TPH-MO			REMARKS
							ANALYSES						S.T.A.T.
MW-4	8/1/90	1:45			VOA'S .	4	X	X					
MW4	8/1/90	1:45			AMBER LITER .	3			X	X			
FIELD BLANK	8/1/90	1:30			VOA .	1	X	X					DETECTION LIMITS
FIELD BLANK	8/1/90	1:50			AMBER LITER .	1			X	X			TPH-G .05 PPM
MW-8	8/1/90	2:20			VOA'S .	3	X	X					TPH-D .05
MW-8	8/1/90	2:20			AMBER LITER .	2			X	X			TPH-MO .5
MW-7	8/1/90	3:20			VOA'S .	3	X	X					BTEX .0005
MW-7	8/1/90	3:20			AMBER LITER .	2			X	X			
2-0801	8/1/90	—			VOA'S .	3	X	X					
2-0801	8/1/90	—			AMBER LITER .	2			X	X			
													custody seal intact 8-8/3
													custody seal 8/2/90 @ 19:30

RELINQUISHED BY: (Signature) Charles Brown	DATE: 8/2/90 TIME: 17:00	RECEIVED BY: (Signartue) Jeff Winkler	RELINQUISHED BY: (Signature) Jeff Winkler	DATE: 8/2/90 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: LV (VIA NCS)		SHIPPED BY: (Signatue)	RECEIVED FOR LAB: (Signature) Kemple	DATE: 8-3-90 TIME: 0800	COURIER FROM AIRPORT: (Signature)

APPENDIX D

RAW DATA FROM FIELD MEASUREMENTS

CONVERSE ENVIRONMENTAL WEST

Well Sampling Summary

Project Name: 630 High St.
Project Number: 88 44 369 20
Date: 8/1/90
Inspector: TWT/CR.

Well Number	Time	Total Depth Previous	Depth to Water	Comments
MW-1	9:58		10.50	no lock or cap ovm reading 350.0 ppm max
MW-2	9.46		11.98	no gasket, no expanding plug, no lock ovm reading 0.0 ppm
MW-3	9:35		10.54'	ovm reading 5.0 ppm
MW-4	9:55		10.87	ovm reading 0.0 ppm
MW-5	9:42		11.29'	ovm reading 0.0 ppm
MW-6	9:33		10.14'	ovm reading 3.6 ppm
MW-7	9:28		9.28'	ovm reading 0.0 ppm
MW-8	9:24		8.44'	ovm reading 0.0 ppm
MW-9	9:49		8.33'	ovm reading 0.0 ppm
MW-10	9:52		9.99'	ovm reading 0.0 ppm

SHELL

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 630 HIGH ST Project No.: 88-44-369-20 Project Manager: R. B.

Date: 8-1-90 Day: WED

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
C. BROWN	0700		0845	1600 *		
						1900
TOM TAYLOR	0715	SEE TOM'S DAILY				

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: 4, 8, 7
Wells/Borings/Structures Surveyed:

Work Accomplished - Not Listed Above - Expanded Description:
HAND BAILED MW1, MW9, MW10. VERY SLOW RECHARGERS. SAMPLE TOMORROW
PUMPED & SAMPLED MW4, MW8, MW7

Deviations From Standard Operating Procedures:

* STOPPED AT ANOTHER SITE 1½ HRS

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 630 High Project No.: 8844 369 20 Project Manager: RMB

Date: 8/1/90 Day: Wednesday

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
Tom	7:15	8:15		5:15		

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:

Purged, Sampled MW4, MW8, MW7
Purged MW9, MW10, MW1

had to retrieve truck from tow yard. manager had it towed even though there were no "No Parking" signs and he had been informed of our presence. He says he forgot and authorized repayment of towing fee but truck suffered a blent from their abuse

Deviations From Standard Operating Procedures:

CONVERSE ENVIRONMENTAL WEST
DAILY REPORT

Project: 630 High St Project No.: 88443690 20 Project Manager: RMD

Date: 8/2/90 Day: Thursday

CONVERSE PERSONNEL

Name	Mobe Start	Mobe End	Arrive Site	Leave Site	Demobe Start	Demobe End
Tim	~~8:00~~		8:00	3:00		3:15

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:
Purged and Sampled MW2, MW3, MW5, MW6
Sampled MW1, MW9, MW10

Deviations From Standard Operating Procedures: