Weiss Associates Environmental and Geologic Services

5500 Shellmound Street, Emeryville, CA 94608-2411 Fax: 510-547-5043 Phone: **510-547-5420**

TRANSMITTAL LETTER

FROM: David Elias

DATE: November 20, 1991

TO: Lowell Miller
Alameda County Department
of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, California 94621-1426

VIA:
- X First Class Mail
- ___ Fax ___ pages
- ___ UPS (Surface)
- ___ Federal Express
- ___ Courier

SUBJECT: Shell Service Station
~~WIC #204-0072-0502~~
2160 Otis Drive
Alameda, California

JOB: 81-429-01

AS:
- ___ We discussed on the telephone on _____
- ___ You requested _____
- ___ We believe you may be interested
- X Is required

WE ARE SENDING:
- X Enclosed
- ___ Under Separate Cover Via _____

Quarterly status report for the subject site

FOR:
- ___ Your information
- X Your use
- ___ Your review & comments
- ___ Return to you

PLEASE:
- X Keep this material
- ___ Return within 2 weeks
- ___ Acknowledge receipt

MESSAGE: Please call if you have any questions.

cc: Kurt Miller, Shell Oil Company, P.O. Box 5278, Concord, California 94520-9998

Lester Feldman, California Regional Water Quality Control Board, San Francisco Bay, 1800 Harrison Street, Oakland, California 94612

Weiss Associates Environmental and Geologic Services

5500 Shellmound Street, Emeryville, CA 94608-2411 Fax: 510-547-5043 Phone: **510-547-5420**

November 19, 1991

Mr. Lowell Miller
Alameda County Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, CA 94621-1426

Re: Shell Service Stations
1601 Webster Street and
2160 Otis Drive
Alameda, CA

Dear Mr. Miller:

The quarterly monitoring reports for these two sites will be delayed because IT Analytical Services did not provide results as scheduled. The analytical results for 2160 Otis Drive were two weeks late. This report was due November 9 and we anticipate sending it by November 21. The analytical results for 1601 Webster Street have not been received and are over two weeks late. We will send this report as soon as possible after receiving the results.

We appreciate your cooperation. Please contact me at (510) 547-5420 if you have any questions or comments.

Sincerely,
Weiss Associates

David Elias
Staff Geologist

91 NOV 22 AM 8:15

DCE:dc
C:\WP51\SHELL\ALAMEDA\434L1OC1.WP

cc: Kurt Miller, Shell Oil Company, P.O. Box 5278, Concord, California 94520-9998

Lester Feldman, Regional Water Quality Control Board- San Francisco Bay, 2101 Webster Street, Suite 500, Oakland, California 94612

11-19-91

Weiss Associates Environmental and Geologic Services

5500 Shellmound Street, Emeryville, CA 94608-2411 Fax: 510-547-5043 Phone: 510-547-5420

November 19, 1991

Mr. Lowell Miller
Alameda County Department
of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, CA 94621-1426

Re: Shell Service Station
WIC #204-0072-0502
2160 Otis Drive
Alameda, California 94501
WA Job #81-429-01

Dear Mr. Miller:

This letter describes Weiss Associates' (WA) fourth quarter 1991 activities at the Shell service station referenced above (Figure 1). This status report satisfies the quarterly reporting requirements outlined in our March 19, 1990 workplan, and prescribed by California Administrative Code Title 23 Waters, Chapter 3, Subchapter 16, Article 5, Section 265.d. Included below are:

- Descriptions and results of activities performed in the fourth quarter 1991, and
- Proposed work for the first quarter 1992.

Proposed ground water sampling frequency modifications, which have been on hold since March 26, 1991 pending approval of the Alameda County Department of Environmental Health, are presented in Table 1.

FOURTH QUARTER 1991 ACTIVITIES

During this quarter, WA:

- Collected ground water samples from the three site wells,

- Measured ground water depths and determined ground water elevations and the flow direction, and

- Analyzed the ground water samples and tabulated the analytic results.

These activities are described below.

Ground Water Sampling

On October 9, 1991 WA collected ground water samples from monitoring wells MW-1, MW-2, and S-1 (Figure 2) as part of the quarterly ground water monitoring program at Shell Service Station WIC #204-0072-0502 in Alameda, California. Ground water samples from monitoring well MW-2 contained benzene, cis-1,2-dichloroethene (c-1,2-DCE), trans-1,2-dichloroethene (t-1,2-DCE), tetrachloroethene (PCE) and vinyl chloride above California Department of Health Services (DHS) maximum contaminant levels (MCLs) for drinking water.

Sampling Personnel: WA Environmental Technician Anni Kreml

Method of Purging Wells: Dedicated PVC bailers

Volume of Water Purged Prior to Sampling:

- Wells were purged of four well-casing volumes, about 21 to 32 gallons each.

Method of Collecting Ground Water Samples:

	Wells
• Drawn through the sampling ports on the sides of dedicated PVC bailers	MW-1 & MW-2
• Decanted from the dedicated PVC bailer	S-1

Methods of Containing Ground Water Samples:

- 40 ml glass volatile organic analysis (VOA) vials, preserved with hydrochloric acid and packed in protective foam sleeves.

All samples were refrigerated and transported under chain-of-custody to the analytical laboratory.

Water Samples Transported to:

- International Technology Analytical Services, Inc. (IT) of San Jose, California, and were received on October 10, 1991

Quality Assurance / Quality Control:

- A travel blank was submitted for analysis.
- An equipment blank was not necessary because all bailers are dedicated to specific wells.

Water sample collection records and chain-of-custody forms are included as Attachments A and B, respectively.

Ground Water Elevations and Flow Direction

- The depth to water was measured in all wells on October 9, 1991. Ground water elevations decreased by less than 0.5 ft from the previous quarter.
- Ground water flows northward, which is consistent with the flow direction during the past year.

Depth to water measurements and ground water elevations are presented in Table 2. Ground water elevation contours are plotted on Figure 2. Previous ground water elevation contour maps are included in Figure 3.

Chemical Analyses

The Ground Water Samples were Analyzed for:

	Wells
• Total Petroleum Hydrocarbon as Gasoline by Modified EPA Method 8015	all wells
• Benzene, Ethylbenzene, Toluene and Xylenes by EPA Method 8020	all wells
• Halogenated Volatile Organic Compounds by EPA Method 601/8010	MW-2

The laboratory analyzed the samples on October 15 and 17, 1991. The results are presented in Table 3 and the analytic reports are included in Attachment B.

Discussion of Analytic Results of Ground Water for this Quarter:

- Ground water samples from monitoring well MW-2 contained benzene, c-1,2-DCE, t-1,2-DCE, PCE, TCE and vinyl chloride in excess of DHS MCLs. Chloroform was detected below DHS MCLs.

- No hydrocarbons have been detected in samples from wells MW-1 and S-1 for five consecutive quarters.

ANTICIPATED WORK FOR FIRST QUARTER 1992

During the first quarter 1992, on behalf of Shell Oil, WA plans to:

- Continue quarterly monitoring of ground water at this site, and

- Prepare a quarterly status report presenting all data generated during the first quarter including water sampling results and analysis.

Please call if you have any questions.

Sincerely,
Weiss Associates

David Elias
Staff Geologist

Joseph P. Theisen, C.E.G.
Senior Hydrogeologist

DE/JPT:pd

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Attachments: Figures
Tables
A - Water Sample Collection Records
B - Analytic Report and Chain-of-Custody Form

cc: Kurt Miller, Shell Oil Company, P.O. Box 5278, Concord, CA 94520-9998

Lester Feldman, Regional Water Quality Control Board - San Francisco Bay, 2101 Webster Street, Oakland, CA 94612

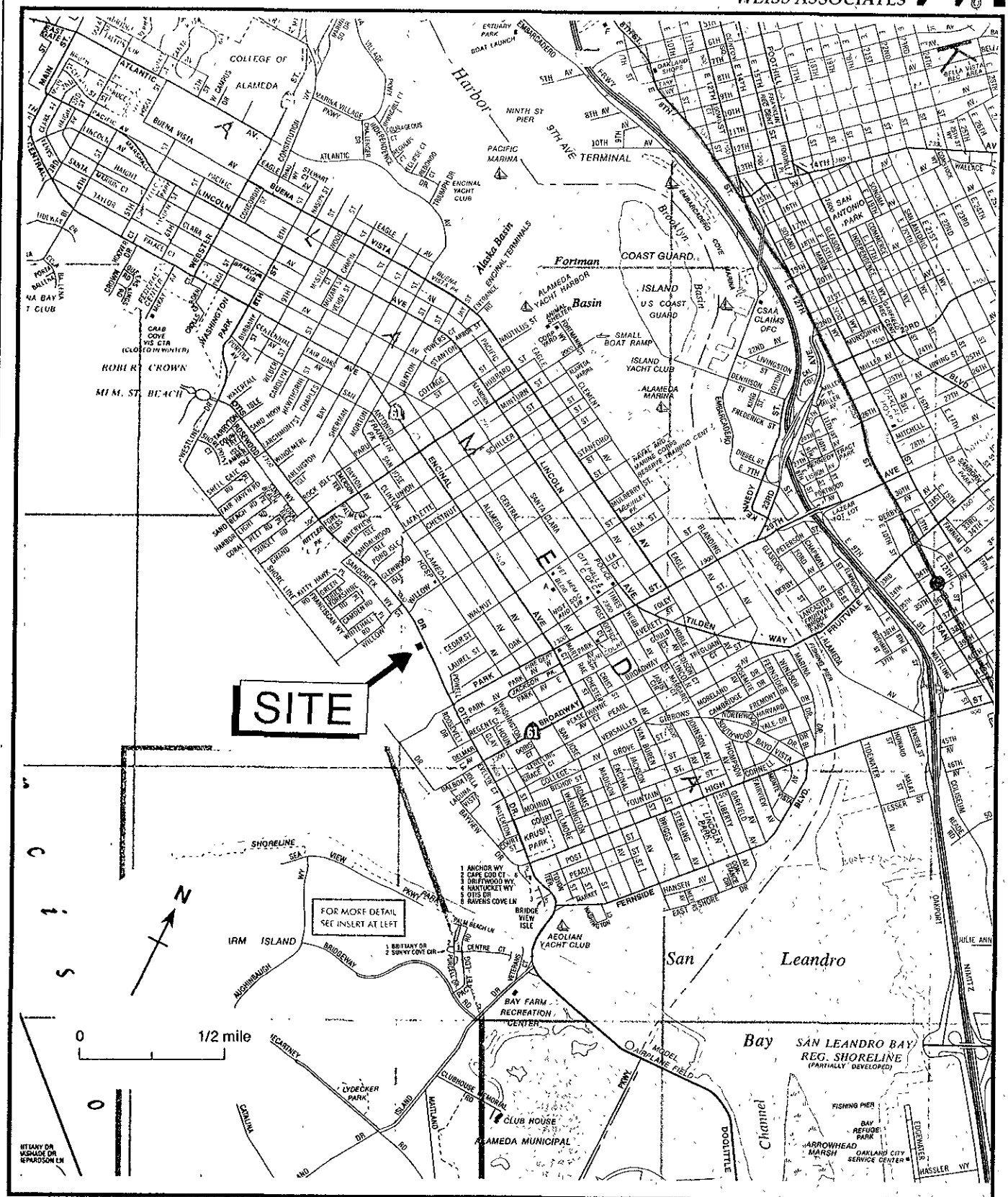

Figure 1. Site Location Map - Shell Service Station, WIC# 204-0072-0502, 2160 Otis Drive, Alameda, CA.

8/21/90

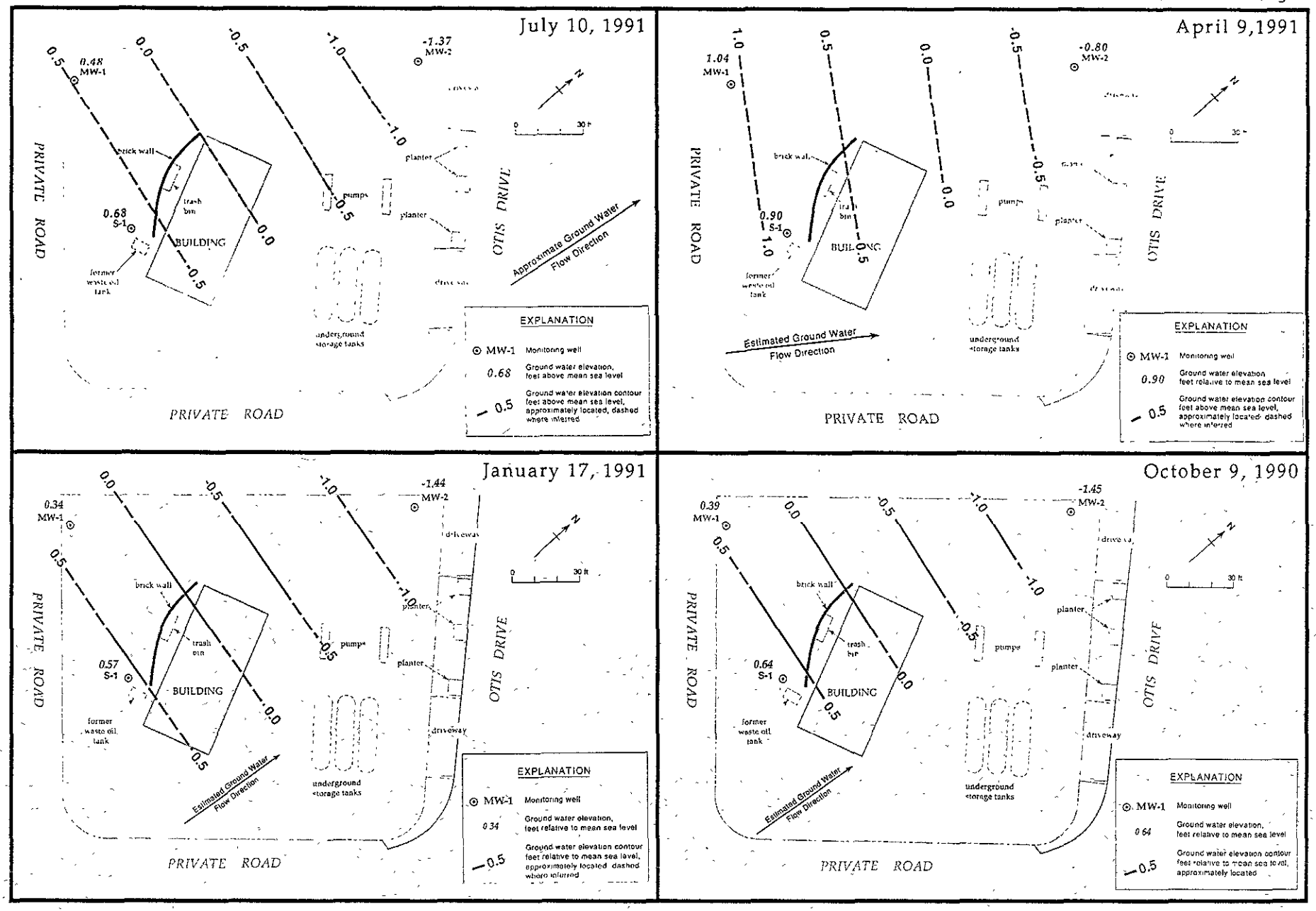

Figure 3. Previous Ground Water Elevation Contour Maps - Shell Service Station WIC#204-0072-0502, 2160 Otis Drive, Alameda, California

10/24/91

Table 1. Proposed Ground Water Sampling Frequency, Shell Service Station, WIC #204-0072-0502, 2160 Otis Drive, Alameda, California

Well ID	Current Sampling Frequency	Recommended Future Sampling Frequency	Rationale for Recommended Sampling Frequency
S-1	Quarterly	Semi-Annually	Virtually no hydrocarbons detected since September 12, 1989; source area well
MW-1	Quarterly	Annually	No hydrocarbons detected for five consecutive quarters; cross-gradient well
MW-2	Quarterly	Quarterly	Variable hydrocarbon concentrations for seven quarters; down-gradient well

Table 2. Ground Water Elevations - Shell Service Station WIC #204-0072-0502, 2160 Otis Drive, Alameda, California

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Water Depth (ft)	Ground Water Elevation (ft relative to msl)
MW-1	04-11-90	6.00	5.23	0.77
	07-10-90		5.40	0.60
	10-09-90		5.61	0.39
	01-17-91		5.66	0.34
	04-09-91		4.96	1.04
	07-10-91		5.52	0.48
	10-09-91		5.70	0.30
MW-2	04-11-90	3.29	4.51	-1.22
	07-10-90		4.61	-1.32
	10-09-90		4.74	-1.45
	01-17-91		4.73	-1.44
	04-09-91		4.09	-0.80
	07-10-91		4.66	-1.37
	10-09-91		4.81	-1.52
S-1	09-11-90	5.10	4.29	0.81
	04-11-90		4.00	1.10
	07-10-90		4.25	0.85
	10-09-90		4.46	0.64
	01-17-91		4.53	0.57
	04-09-91		4.20	0.90
	07-10-91		4.42	0.68
	10-09-91		4.87	0.23

Table 3. Analytic Results for Ground Water - Shell Service Station WIC# 204-0072-0502, 2160 Otis Drive, Alameda, California

Well ID	Date Sampled	Depth to Water (ft)	Analytical Lab	TPH-G	TPH-D	B	E	T	X	TOG	VOCs
				<----------parts per million (mg/L)---------->							
S-1	09/04/87[a]		IT	---	---	<0.005	<0.005	<0.005	<0.005	---	b
	09/11/89[c]	4.29	IT	<0.05	<0.1	<0.0005	<0.001	<0.001	<0.003	<1.0	<0.005-0.050
	04/11/90	4.00	NET	<0.050	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	<10	d
	07/10/90	4.25	NET	0.090	---	<0.0005	<0.0005	<0.0005	<0.0005	<10	<0.0004-0.010
	10/09/90	4.46	IT	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	<5	<0.0005
	01/17/91	4.53	IT	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---
	04/09/91	4.20	IT	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---
	07/10/91	4.42	IT	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---
	10/09/91	**4.87**	**IT**	**<0.05**	---	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**	---	---
MW-1	04/11/90	5.23	NET	<0.050	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	<10	<0.0004-0.010
	07/10/90	5.40	NET	0.10	---	<0.0005	<0.0005	<0.0005	<0.0005	<10	<0.0004-0.010
	10/09/90	5.61	IT	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	<5	<0.0005
	01/17/91	5.66	IT	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---
	04/09/91	4.96	IT	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---
	07/10/91	5.52	IT	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---
	10/09/91	**5.70**	**IT**	**<0.05**	---	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**	---	---
MW-2	04/11/90	4.51	NET	0.20[e] 200 ppb	0.22	0.0027 2.7 ppb	<0.0005	0.0005	0.0024	<10	f
	07/10/90	4.61	NET	0.57[e] 570 ppb	0.45	0.15 150 ppb	<0.0005	0.0009	0.0031	<10	g
	10/09/90	4.74	IT	190[e]	0.051	55	<0.0005	<0.0005	<0.0005	<5	h
	01/17/91	4.73	IT	0.35[e] 350 ppb	<0.05	0.051 51 ppb	<0.0005	<0.0005	<0.0005	---	i
	04/09/91	4.09	IT	---	<0.05	0.021 21 ppb	<0.005	<0.005	<0.005	---	j
	07/10/91	4.66	IT	0.05[e]	<0.05	0.0084 8.4 ppb	<0.0005	<0.0005	<0.0005	---	k
	10/09/91	**4.81**	**IT**	**0.15**	---	**0.022** 22 ppb	**<0.0005**	**<0.0005**	**<0.0005**	---	l
Trip Blank	07/10/90		NET	<0.050	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---
	10/09/90		IT	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---
	01/17/91		IT	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---
	04/09/91		IT	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---
	07/10/91		IT	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---
	10/09/91		**IT**	**<0.05**	---	**<0.0005**	**<0.0005**	**<0.0005**	**<0.0005**	---	---
DHS MCLs				NE	NE	0.001	0.680	0.10[m]	1.750	NE	n

-- Table 3 continued on next page --

Table 3. Analytic Results for Ground Water - Shell Service Station WIC# 204-0072-0502, 2160 Otis Drive, Alameda, California

Abbreviations:

TPH-G = Total petroleum hydrocarbons as gasoline by Modified EPA Method 8015
TPH-D = Total petroleum hydrocarbons as diesel by Modified EPA Method 8015
B = Benzene by EPA Method 602, 624, 8020, or 8240
E = Ethylbenzene by EPA Method 602, 624, 8020, or 8240
T = Toluene by EPA Method 602, 624, 8020, or 8240
X = Xylenes by EPA Method 602, 624, 8020, or 8240
TOG = Total non-polar oil and grease by American Public Health Association Standard Methods 503A&E
VOCs = Volatile and halogenated volatile organic compounds by EPA Method 601, 624 or 8240
--- = Not analyzed
NE = Not established
DHS MCLs = California Department of Health Services maximum contaminant levels
<n = Not detected above detection limit of n ppm

Analytical Laboratories:

IT = International Technology Analytical Services, San Jose, California
NET = National Environment Testing Pacific Inc., Santa Rosa, California

Notes:

a = Sampled by Pacific Environmental Group, Santa Clara, California
b = 0.007 ppm unknown alcohol and 0.27 ppm acetone detected
c = 0.090 ppm chromium, 0.090 ppm lead and 0.10 ppm Zn detected; no cadium detected above detection limit of 0.010 ppm by EPA Method 6010. No semi-volatile organic compounds or PCBs detected by EPA Method 625. DHS MCLs for Cr = 0.05 ppm; Pb = 0.05 ppm; secondary MCL for Zn = 5 ppm.
d = 0.0017 ppm chloroform detected
e = Chromatographic pattern not typical for gasoline; according to the laboratory, the concentration is due mostly to lighter hydrocarbon compounds.
f = 0.0045 ppm chloroform, 0.016 ppm trans-1,2-dichloroethene (t-1,2-DCE), and 0.0012 ppm trichloroethene (TCE) detected
g = 0.0017 ppm chloroform, 0.00044 ppm 1,2-dichloroethane (1,2-DCA), 0.011 ppm t-1,2-DCE and 0.00093 ppm TCE detected
h = 0.015 ppm chloroform, 0.046 ppm cis-1,2-dichloroethene (c-1,2-DCE), 0.0067 ppm t-1,2-DCE, 0.0016 ppm tetrachloroethene (PCE), 0.0013 ppm TCE and 0.0025 ppm vinyl chloride detected
i = 0.0005 ppm chlorobenzene, 0.0026 ppm chloroform, 0.0005 ppm 1,2-DCA, 0.074 ppm c-1,2-DCE, 0.012 ppm t-1,2-DCE, 0.0006 ppm PCE, 0.0012 ppm TCE and 0.0030 ppm vinyl chloride detected
j = 0.064 ppm total 1,2-DCE detected
k = 0.014 ppm carbon disulfate, 0.043 ppm chloroform, 0.0069 ppm PCE and 0.0092 ppm benzene detected by EPA Method 8240
l = 0.0074 ppm chloroform 0.054 ppm c-1,2-DCE, 0.016 ppm t-1,2-DCE, 0.0128 ppm PCE, 0.0019 ppm TCE and 0.0017 ppm vinyl chloride detected
m = DHS recommended action level for drinking water; MCL not established
n = DHS MCL for chlorobenzene = 0.030 ppm; 1,2-DCA = 0.0005 ppm; chloroform = 0.100 ppm; TCE = 0.005 ppm; PCE = 0.005 ppm; vinyl chloride = 0.0005 ppm; t-1,2-DCE = 0.010 ppm; c-1,2-DCE = 0.006 ppm

ATTACHMENT A

WATER SAMPLE COLLECTION RECORDS

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name MW-1 Date 10/9/91 Time of Sampling 12:58

Job Name SHELL ALAMEDA Job Number 91-429-01 Initials AEK

Sample Point Description MW (M = Monitoring Well)

Location NW (BACK) CORNER OF PROP.

WELL DATA: Depth to Water 5.70 ft (static) pumping) Depth to Product — ft.

Product Thickness — Well Depth 16.0 ft (spec) Well Depth — ft(sounded) Well Diameter 4 in

Initial Height of Water in Casing 10.30 ft. = volume 6.72 gal.

4 Casing Volumes to be Evacuated. Total to be evacuated 26.90 gal.

EVACUATION METHOD: Pump # and type — Hose # and type —

Bailer# and type 4" PVC 3' Dedicated Y (Y/N)

Other —

Evacuation Time: Stop 12:26 12:35 12:42

Start 12:19 12:28 12:38

Total Evacation Time 18 min

Total Evacuated Prior to Sampling 27 gal.

Evacuation Rate 1.5 gal. per minute

Depth to Water during Evacuation — ft. — time

Depth to Water at Sampling 6.36 ft. 13:02 time

Evacuated Dry? N After — gal. Time —

80% Recovery = —

% Recovery at Sample Time 94% Time 12:58

Formulas/Conversions

r = well radius in ft.

h = ht of water col in ft.

vol. in cyl. = $\pi r^2 h$

7.48 gal/ft^3

V_2" casing = 0.163 gal/ft

V_3" casing = 0.367 gal/ft

V_4" casing = 0.653 gal/ft

$V_{4.5}$" casing = 0.826 gal/ft

V_6" casing = 1.47 gal/ft

V8 casing = 2.61 gal/ft

CHEMICAL DATA: Meter Brand/Number

Calibration: 4.0 7.0 10.0

Measured:	SC/μmhos	pH	T°C	Time	Volume Evacuated (gal.)

SAMPLE: Color ALMOST CLEAR Odor NONE

Description of matter in sample: SOME FINE SAND

Sampling Method: SAMPLE PORT / DED. BLR.

Sample Port: Rate — gpm Totalizer — gal.

Time

# of Cont.	Sample ID	Cont. Type[1]	Vol[2]	Fil[3]	Ref[4]	Preservative (specify)	Analytic Method	Turn[5]	LAB
3	101-01	W/CV	40ml	N	Y	HCL	8015/8020	N	IT

1 Sample Type Codes: W = Water, S = Soil, Describe Other
Container Type Codes: V = VOA/Teflon Septa, P = Plastic, C or B = Clear/Brown Glass, Describe Other
Cap Codes: PT = Plastic, Teflon lined;
2 = Volume per container; 3 = Filtered (Y/N); 4 = Refrigerated (Y/N)
5 Turnaround [N = Normal, W = 1 week, R = 24 hour, HOLD (spell)]

ADDITIONAL COMMENTS, CONDITIONS, PROBLEMS:

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name S-1 Date 10/7/91 Time of Sampling 14:54

Job Name SHELL ALAMEDA I Job Number 81-429-01 Initials AEK

Sample Point Description MON. WELL (M = Monitoring Well)

Location BEHIND BLDG.

WELL DATA: Depth to Water 4.87 ft (static, pumping) Depth to Product — ft.

Product Thickness — Well Depth 19.0 ft (spec) Well Depth — ft(sounded) Well Diameter 3 in

Initial Height of Water in Casing 14.13 ft. = volume 5.19 gal.

4 Casing Volumes to be Evacuated. Total to be evacuated 20.74 gal.

EVACUATION METHOD: Pump # and type — Hose # and type —

Bailer# and type 1/2" PVC 5' Dedicated Y (Y/N)

Other —

Evacuation Time:

Stop	11:54	12:10	13:35	14:04	14:33
Start	11:41	12:06	13:23	13:59	~~14:14~~ 14.28

Total Evacation Time 39 min

Total Evacuated Prior to Sampling 21 gal.

Evacuation Rate .54 gal. per minute

Depth to Water during Evacuation ~~4.87~~ AEK ft. ~~11:06~~ AEK time

Depth to Water at Sampling 8.47 ft. 14:56 time

Evacuated Dry? Y After 6.0 gal. Time 13 min

80% Recovery = 7.70 DTW

% Recovery at Sample Time 74% Time 14:56

Formulas/Conversions

r = well radius in ft.

h = ht of water col in ft.

vol. in cyl. = $\pi r^2 h$

7.48 gal/ft^3

V_2" casing = 0.163 gal/ft

V_3" casing = 0.367 gal/ft

V_4" casing = 0.653 gal/ft

$V_{4.5}$" casing = 0.826 gal/ft

V_6" casing = 1.47 gal/ft

V8 casing = 2.61 gal/ft

CHEMICAL DATA: Meter Brand/Number —

Calibration: ____ 4.0 ____ 7.0 ____ 10.0

Measured:	SC/μmhos	pH	T°C	Time	Volume Evacuated (gal.)

SAMPLE: Color LT. TAN Odor NONE

Description of matter in sample: FINE SAND

Sampling Method: TEFLON BAILER

Sample Port: Rate — gpm Totalizer — gal.

Time

# of Cont.	Sample ID	Cont. Type[1]	Vol[2]	Fil[3]	Ref[4]	Preservative (specify)	Analytic Method	Turn[5]	LAB
3	101-S1	W/CV	40mL	N	Y	HCL	8015 / 8020 ~~8AEK~~	N	IT

1 Sample Type Codes: W = Water, S = Soil, Describe Other
Container Type Codes: V = VOA/Teflon Septa, P = Plastic, C or B = Clear/Brown Glass, Describe Other
Cap Codes: PT = Plastic, Teflon lined;
2 = Volume per container; 3 = Filtered (Y/N); 4 = Refrigerated (Y/N)
5 Turnaround [N = Normal, W = 1 week, R = 24 hour, HOLD (spell)]

ADDITIONAL COMMENTS, CONDITIONS, PROBLEMS:

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name MW-2 Date 10/9/91 Time of Sampling 16:17

Job Name SHELL ALAMEDA I Job Number 81-429-01 Initials AEK

Sample Point Description M (M = Monitoring Well)

Location N. (FRONT) CORNER OF PROP (OTIS ST.)

WELL DATA: Depth to Water 4.81 ft (static, pumping) Depth to Product — ft.

Product Thickness — Well Depth 17.0 ft (spec) Well Depth — ft(sounded) Well Diameter 4 in

Initial Height of Water in Casing 12.19 ft. = volume 7.96 gal.

4 Casing Volumes to be Evacuated. Total to be evacuated 31.84 gal.

EVACUATION METHOD: Pump # and type — Hose # and type —

Bailer# and type 4" PVC 3' Dedicated Y (Y/N)

Other —

Evacuation Time: Stop 15:39 15:59 16:10

Start 15:30 15:50 16:08

Total Evacation Time 20min

Total Evacuated Prior to Sampling 32 gal.

Evacuation Rate 1.6 gal. per minute

Depth to Water during Evacuation — ft. — time

Depth to Water at Sampling 6.45 ft. 16:28 time

Evacuated Dry? N After — gal. Time —

80% Recovery = —

% Recovery at Sample Time 86% Time 16:28

Formulas/Conversions

r = well radius in ft.

h = ht of water col in ft.

vol. in cyl. = $\pi r^2 h$

7.48 gal/ft^3

V_2" casing = 0.163 gal/ft

V_3" casing = 0.367 gal/ft

V_4" casing = 0.653 gal/ft

$V_{4.5}$" casing = 0.826 gal/ft

V_6" casing = 1.47 gal/ft

V8 casing = 2.61 gal/ft

CHEMICAL DATA: Meter Brand/Number —

Calibration: — 4.0 — 7.0 — 10.0

Measured:	SC/μmhos	pH	T°C	Time	Volume Evacuated (gal.)

SAMPLE: Color CLOUDY TAN Odor MOD. STRONG

Description of matter in sample: FINE SUSPENDED SILT

Sampling Method: SAMPLE PORT ON DED. BAILER

Sample Port: Rate — gpm Totalizer — gal.

Time

# of Cont.	Sample ID	Cont. Type[1]	Vol[2]	Fil[3]	Ref[4]	Preservative (specify)	Analytic Method	Turn[5]	LAB
3	101-02	W/CV	40mL	N	Y	HCL	8015/8020	N	IT
3	101-02	W/CV	40mL	N	Y	HCL	8010	N	IT

1 Sample Type Codes: W = Water, S = Soil, Describe Other
Container Type Codes: V = VOA/Teflon Septa, P = Plastic, C or B = Clear/Brown Glass, Describe Other
Cap Codes: PT = Plastic, Teflon lined;
2 = Volume per container; 3 = Filtered (Y/N); 4 = Refrigerated (Y/N)
5 Turnaround [N = Normal, W = 1 week, R = 24 hour, HOLD (spell)]

ADDITIONAL COMMENTS, CONDITIONS, PROBLEMS:

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name TRIP BLANKS Date 10/9/91 Time of Sampling 13:51

Job Name SHELL ALAMEDA I Job Number 81-429-01 Initials AEK

Sample Point Description TEFLON BAILER (M = Monitoring Well)

Location

WELL DATA: Depth to Water ____ ft (static, pumping) Depth to Product ____ ft.

Product Thickness ____ Well Depth ____ ft (spec) Well Depth ____ ft(sounded) Well Diameter ____ in

Initial Height of Water in Casing ____ ft. = volume ____ gal.

____ Casing Volumes to be Evacuated. Total to be evacuated ____ gal.

EVACUATION METHOD: Pump # and type ____ Hose # and type ____

Bailer# and type ____ Dedicated ____ (Y/N)

Other ____

Evacuation Time: Stop ____ ____ ____

Start ____ ____ ____

Total Evacation Time ____

Total Evacuated Prior to Sampling ____ gal.

Evacuation Rate ____ gal. per minute

Depth to Water during Evacuation ____ ft. ____ time

Depth to Water at Sampling ____ ft. ____ time

Evacuated Dry? ____ After ____ gal. Time ____

80% Recovery = ____

% Recovery at Sample Time ____ Time ____

Formulas/Conversions

r = well radius in ft.

h = ht of water col in ft.

vol. in cyl. = $\pi r^2 h$

7.48 gal/ft^3

V_2" casing = 0.163 gal/ft

V_3" casing = 0.367 gal/ft

V_4" casing = 0.653 gal/ft

$V_{4.5}$" casing = 0.826 gal/ft

V_6" casing = 1.47 gal/ft

V8 casing = 2.61 gal/ft

CHEMICAL DATA: Meter Brand/Number ____

Calibration: ____ 4.0 ____ 7.0 ____ 10.0

Measured:	SC/µmhos	pH	T°C	Time	Volume Evacuated (gal.)

SAMPLE: Color CLEAR Odor NONE

Description of matter in sample: NONE

Sampling Method: TEFLON BAILER

Sample Port: Rate ____ gpm Totalizer ____ gal.

Time

# of Cont.	Sample ID	Cont. Type[1]	Vol[2]	Fil[3]	Ref[4]	Preservative (specify)	Analytic Method	Turn[5]	LAB
3	101-21	W/VC	40ml	N	Y	HC	AEK ~~TPH~~ 8015/8020	N	IT

1 Sample Type Codes: W = Water, S = Soil, Describe Other
Container Type Codes: V = VOA/Teflon Septa, P = Plastic, C or B = Clear/Brown Glass, Describe Other
Cap Codes: PT = Plastic, Teflon lined;
2 = Volume per container; 3 = Filtered (Y/N); 4 = Refrigerated (Y/N)
5 Turnaround [N = Normal, W = 1 week, R = 24 hour, HOLD (spell)]

ADDITIONAL COMMENTS, CONDITIONS, PROBLEMS:

ATTACHMENT B

ANALYTIC RESULTS AND CHAIN-OF-CUSTODY FORM

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Shell Oil Company
Weiss Associates
5500 Shellmound Street
Emeryville, CA 94608
Tom Fojut

Date: 10/29/91

Work Order: T1-10-137

P.O. Number: MOH 880-021 Vendor #I0002402

This is the Certificate of Analysis for the following samples:

Client Work ID: 81-429-01 2160 Otis Dr Ala.
Date Received: 10/10/91
Number of Samples: 4
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

Reviewed and Approved:

Richard Jacobs

(for) Elizabeth M. Hager
Project Manager

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/29/91
Client Work ID: 81-429-01 2160 Otis Dr Ala.

Work Order: T1-10-137

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **101-01**
SAMPLE DATE: **10/09/91**
LAB SAMPLE ID: **T110137-01**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/15/91
Low Boiling Hydrocarbons	Mod.8015		10/15/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	**None**
BTEX		
Benzene	0.0005	**None**
Toluene	0.0005	**None**
Ethylbenzene	0.0005	**None**
Xylenes (total)	0.0005	**None**

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	**108.**
1,3-Dichlorobenzene (BTEX)	**92.**

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/29/91
Client Work ID: 81-429-01 2160 Otis Dr Ala.

Work Order: T1-10-137

TEST NAME: **Halocarbons by 8010/601**

SAMPLE ID: **101-02**
SAMPLE DATE: **10/09/91**
LAB SAMPLE ID: **T110137-02**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool**
EXTRACTION DATE: **N/A**
ANALYSIS DATE: **10/17/91**

RESULTS in Micrograms per Liter

PARAMETER	DETECTION LIMIT	DETECTED
Chloromethane	1.0	None
Bromomethane	1.0	None
Vinyl chloride	1.0	1.7
Chloroethane	1.0	None
Methylene Chloride	1.0	None
1,1-Dichloroethene	1.0	None
1,1-Dichloroethane	1.0	None
Chloroform	1.0	7.4
1,2-Dichloroethane	1.0	None
1,1,1-Trichloroethane	1.0	None
Carbon tetrachloride	1.0	None
Bromodichloromethane	1.0	None
1,1,2,2-Tetrachloroethane	1.0	None
1,2-Dichloropropane	1.0	None
trans-1,3-dichloropropene	1.0	None
Trichloroethene	1.0	1.9
Dibromochloromethane	1.0	None
1,1,2-Trichloroethane	1.0	None
cis-1,3-Dichloropropene	1.0	None
Bromoform	1.0	None
Tetrachloroethene	1.0	2.8
Dichlorodifluoromethane	1.0	None
Trichlorofluoromethane	1.0	None
cis-1,2-Dichloroethene	1.0	54.
trans-1,2-Dichloroethene	1.0	16.
Chlorobenzene	1.0	None
1,2-Dichlorobenzene	1.0	None
1,3-Dichlorobenzene	1.0	None
1,4-Dichlorobenzene	1.0	None
1,1,2-Trichlorotrifluoroethane	1.0	None
1-Chloro-2-fluorobenzene (Surr)	70-120%	98%

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/29/91
Client Work ID: 81-429-01 2160 Otis Dr Ala.

Work Order: T1-10-137

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **101-02**
SAMPLE DATE: **10/09/91**
LAB SAMPLE ID: **T110137-02**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/15/91
Low Boiling Hydrocarbons	Mod.8015		10/15/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	**0.15**
BTEX		
Benzene	0.0005	**0.022**
Toluene	0.0005	**None**
Ethylbenzene	0.0005	**None**
Xylenes (total)	0.0005	**None**

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	**107.**
1,3-Dichlorobenzene (BTEX)	**106.**

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/29/91
Client Work ID: 81-429-01 2160 Otis Dr Ala.

Work Order: T1-10-137

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **101-S1**
SAMPLE DATE: **10/09/91**
LAB SAMPLE ID: **T110137-03**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/15/91
Low Boiling Hydrocarbons	Mod.8015		10/15/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	**None**
BTEX		
Benzene	0.0005	**None**
Toluene	0.0005	**None**
Ethylbenzene	0.0005	**None**
Xylenes (total)	0.0005	**None**

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	**114.**
1,3-Dichlorobenzene (BTEX)	**82.**

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/29/91
Client Work ID: 81-429-01 2160 Otis Dr Ala.

Work Order: T1-10-137

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **101-21**
SAMPLE DATE: **10/09/91**
LAB SAMPLE ID: **T110137-04**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		10/15/91
Low Boiling Hydrocarbons	Mod.8015		10/15/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	**None**
BTEX		
Benzene	0.0005	**None**
Toluene	0.0005	**None**
Ethylbenzene	0.0005	**None**
Xylenes (total)	0.0005	**None**

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	**111.**
1,3-Dichlorobenzene (BTEX)	**102.**

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/29/91
Client Work ID: 81-429-01 2160 Otis Dr Ala.

Work Order: T1-10-137

TEST NAME: **Spike and Spike Duplicates**

SAMPLE ID: **Quality Control**
SAMPLE DATE: **not spec**
LAB SAMPLE ID: **T110137-05A**
EXTRACTION DATE:
ANALYSIS DATE: **10/17/91**
ANALYSIS METHOD: **601/8010**

QUALITY CONTROL REPORT

Laboratory Spike(LS) and Laboratory Spike Duplicate(LSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	LS Result	LSD Result	LS %Rec	LSD %Rec	RPD
Chlorobenzene	None	10.0	9.57	9.76	96.	98.	2.
1,1-Dichloroethene	None	10.0	9.63	11.1	96.	111.	14.
Trichloroethene	None	10.0	8.17	9.43	82.	94.	14.

SURROGATES	LS %Rec	LSD %Rec
1-Chloro-2-fluoro-benzene (601)	84.	86.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/29/91
Client Work ID: 81-429-01 2160 Otis Dr Ala.

Work Order: T1-10-137

TEST NAME: **Spike and Spike Duplicates**

SAMPLE ID: **Quality Control**
SAMPLE DATE: **not spec**
LAB SAMPLE ID: **T110137-05A**
EXTRACTION DATE:
ANALYSIS DATE: **10/15/91**
ANALYSIS METHOD: **Mod. 8015**

QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

RESULTS in Micrograms per Liter

PARAMETER	Sample Amt	Spike Amt	MS Result	MSD Result	MS %Rec	MSD %Rec	RPD
Gasoline	ND<50.	500.	481.	471.	96.	94.	2.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	*119.	*116.

*Surrogate elevated due to hydrocarbon interferences.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/29/91
Client Work ID: 81-429-01 2160 Otis Dr Ala.

Work Order: T1-10-137

TEST CODE **601** TEST NAME **Halocarbons by 8010/601**

The method of analysis for volatile halocarbons is taken from EPA Methods 601 and 8010. Samples are examined using the purge and trap technique. Final detection is by gas chromatography using an electrolytic conductivity detector.

TEST CODE **QC** TEST NAME **Quality Control**

Quality control (QC) samples are analyzed and used to assess the laboratory control measures. Routine QC samples include method blanks, spikes and duplicates. The purpose of the method blank (MB) analysis is to demonstrate that artifacts of the test do not yield false positives. The laboratory control spike (LS) and /or matrix spike (MS) analysis is used to evaluate the ability of the test to recover analytes of interest, i.e. accuracy. Accuracy is expressed as percent (%) recovery. The laboratory spike duplicate (LSD), matrix spike duplicate (MSD), or duplicate sample (DUP) is used to determine the precision of the test, by comparing the result from the original spike (or sample) to the duplicate spike (or sample). Precision is expressed as relative percent difference (RPD).

The results of appropriate QC samples from QC batches associated with the listed samples are included in this report.

TEST CODE **TPHVB** TEST NAME **TPH Gas,BTEX by 8015/8020**

The method of analysis for low boiling hydrocarbons is taken from EPA Methods modified 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatography using a flame ionization detector in series with a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline. Results in soils are corrected for moisture content and are reported on a dry soil basis unless otherwise noted.

Anni 10/9/91

T1-10-137

WEISS ASSOCIATES
5500 Shellmound St., Emeryville, CA 94608
Phone: 415-547-5420 FAX: 415-547-5043

Shell Service Station Address:
2160 OTIS DRIVE
ALAMEDA CA

Shell Contact: KURT MILLER
WIC #: 204-0072-0502
~~APE #:~~ EXP 5461

Please send analytic results and a copy of the signed chain of custody form to:

TOM FOJUT

Project ID: 81-429-01

CHAIN-OF-CUSTODY RECORD AND ANALYTIC INSTRUCTIONS

Lab Personnel:
1) Specify analytic method and detection limit in report.
2) Notify us if there are any anomalous peaks on GC or other scans.
3) ANY QUESTIONS/CLARIFICATIONS: CALL US.

Sampled by: ANNI KREML

Laboratory Name: IT

No. of Containers	Sample ID	Container Type	Sample Date	Vol[2]	Fil[3]	Ref[4]	Preservative (specify)	Analyze for	Analytic Method	Turn[5]	COMMENTS
01ABC 3	101-01	W/CV	10/9/91	40ml	N	Y	HCl	TPH-G/BETX	8015/8020	N	Cool @ 10/10/91
02ABC 3	101-02	W/CV	10/9/91	40ml	N	Y	HCl	TPH-G/BETX	8015/8020	N	
03ABC 3	101-02	W/CV	10/9/91	40ml	N	Y	HCl	HVOC's	8010	N	
04ABC 3	101-~~01~~	W/CV	10/9/91	40ml	N	Y	HCl	TPH-G/BETX	8015/8020	N	
05ABC 3	101-21	W/CV	10/9/91	40ml	N	Y	HCl	TPH-G/BETX	8015/8020	N	

1 Anni Kreml 10/9/91
Released by (Signature), Date

1 WEISS ASSOCIATES
Affiliation

2 James Martung 10/10/91
Received by (Signature), Date

2 I.T. Corp Lab
Affiliation

3 James Martung 10-10-91
Released by (Signature), Date

3 I.T. Corp 12:30
Affiliation

4
Shipping Carrier, Method, Date

4
Affiliation

5
Released by (Signature), Date

5
Affiliation

6 Josephine DeCarli ITAS/SJ 10/10/91 x yes
Received by Lab Personnel, Date — Seal Intact?

6 IT Corp
Affiliation, Telephone

1 Sample Type Codes: W = Water, S = Soil, Describe Other; Container Type Codes: V = VOA/Teflon Septa, P = Plastic, C or B - Clear/Brown Glass, Describe Other; Cap Codes: PT = Plastic, Teflon Lined 2 = Volume per container; 3 = Filtered (Y/N); 4 = Refrigerated (Y/N)
5 Turnaround [N = Normal, W = 1 Week, R = 24 Hour, HOLD (write out)]
ADDITIONAL COMMENTS, CONDITIONS, PROBLEMS: