reviewed 12/28/91 Sa

WEISS ASSOCIATES
Geologic and Environmental Services
Fax: 415-547-5043 Phone: 415-547-5420
5500 Shellmound Street, Emeryville, CA 94608

March 5, 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- 0072-0403
1601 Webster Street
Alameda, California
WA Job #81-434-01

Dear Mr. Miller:

This letter describes Weiss Associates' (WA) first quarter 1991 activities at the Shell service station referenced above. 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 to date in the first quarter 1991, and
- Proposed work for the remainder of the first quarter 1991 and the second quarter 1991.

FIRST 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,
- Analyzed the ground water samples and tabulated the analytic results, and

- Evaluated the site for sampling frequency modifications.

These activities are described below.

Ground Water Sampling

WA collected ground water samples from all three monitoring wells on January 25, 1991 as part of the quarterly ground water monitoring program at Shell Service Station WIC #204-0072-0403 in Alameda, California. Ground water samples from monitoring well MW-2 (Figure 2) contained benzene, xylenes, and 1,2-dichloroethane (1,2-DCA) above the California Department of Health Services (DHS) maximum contaminant levels (MCLs) and toluene above the DHS recommended action level (RAL) for drinking water.

Sampling Personnel: WA Environmental Technicians Paul Cardoza and Brian Busch

Monitoring Wells Sampled: MW-1, MW-2, And S-1

Method of Purging Wells:

- Dedicated PVC bailers

Volume of Water Purged Prior to Sampling:

- Wells were purged of four well-casing volumes, about 14 to 28 gallons each.

Method of Collecting Ground Water Samples:	Wells
• Drawn through sampling ports on the side of dedicated PVC bailers	MW-1 and MW-2
• Decanted from 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), San Jose, California, and were received on January 28, 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 in Attachments A and B, respectively.

Ground Water Elevations and Flow Direction

- The depth to water was measured in all wells on January 25, 1991. Ground water elevations decreased about 0.05 ft to historically low levels.
- Ground water flows north-northwestward. The flow direction has rotated from north-northeast to north-northwest during the past year.

Depth to water measurements and ground water elevations are presented in Table 1. Ground water elevation contours are plotted on Figure 2. Previous ground water elevation contour maps are included in Attachment C.

The Ground Water Samples were Analyzed for:	Wells
• Total petroleum hydrocarbons as gasoline (TPH-G) by modified EPA Method 8015	all wells
• Benzene, ethylbenzene, toluene and xylenes (BETX) by EPA Method 8020	all wells
• Halogenated volatile organic compounds (HVOCs) by EPA Method 601	MW-1 and MW-2

The laboratory analyzed the samples on February 2 through 6, 1991. The results are presented in Table 2 and the analytic reports are included in Attachment B.

Discussion of Analytic Results of Ground Water for this Quarter:

- Ground water from monitoring well MW-2 contained benzene, xylenes, and 1,2-DCA above the DHS MCLs and toluene above the DHS RAL for drinking water.
- TPH-G and BETX concentrations in samples from well MW-2 increased from the previous quarter.
- No TPH-G or BETX have been detected in samples from wells MW-1 and S-1 for four consecutive quarters.
- The slight xylene concentration detected in the travel blank is unexplained.

Sampling Frequency Modification

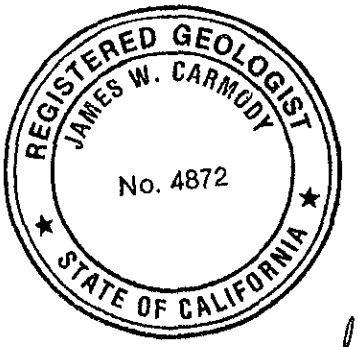
WA has developed criteria to determine when the ground water sampling frequency can be modified for ground water monitoring programs (Attachment D). Based on these criteria, WA recommends modifying the sampling frequency of the site wells as shown in Table 3. Subject to your approval, WA will initiate this program on the next sampling episode scheduled for April 1991.

ANTICIPATED WORK FOR SECOND QUARTER 1991

During the remainder of the first quarter 1991 and the second quarter 1991, on behalf of Shell Oil, WA plans to:

- Continue quarterly monitoring of ground water at this site,
- Prepare a quarterly status report presenting all data generated during the previous quarter including water sampling results and analysis; and
- Pursue WA's recommendations for sampling frequency modifications.

We trust that this submittal satisfies your requirements. Please contact Tom Fojut or Eric Anderson if you have any questions.



Sincerely,
Weiss Associates

Thomas Fojut

Thomas J. Fojut
Staff Geologist

James W Carmody

for Joseph P. Theisen, R.G.
Senior Project Hydrogeologist

TJF/JPT:jg

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Figures
Tables
Attachments:
A - Water Sample Collection Records
B - Analytic Reports and Chain-of-Custody Form
C - Previous Ground Water Elevation Contour Maps
D - Sampling Frequency Modification Criteria

FIGURES

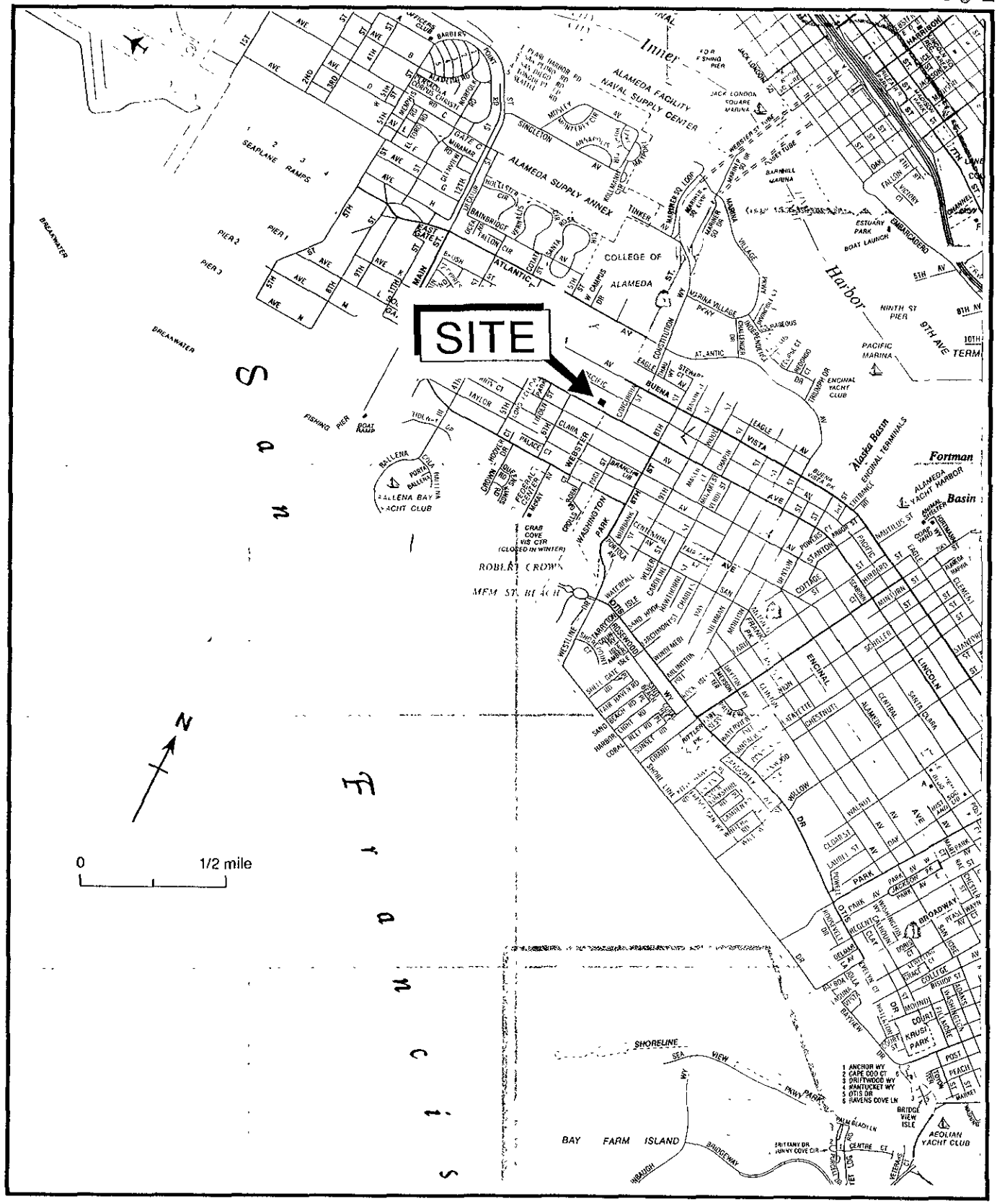

Figure 1. Site Location Map - Shell Service Station, WIC# 204-0072-0403, 1601 Webster Street, Alameda, CA

8/20/90

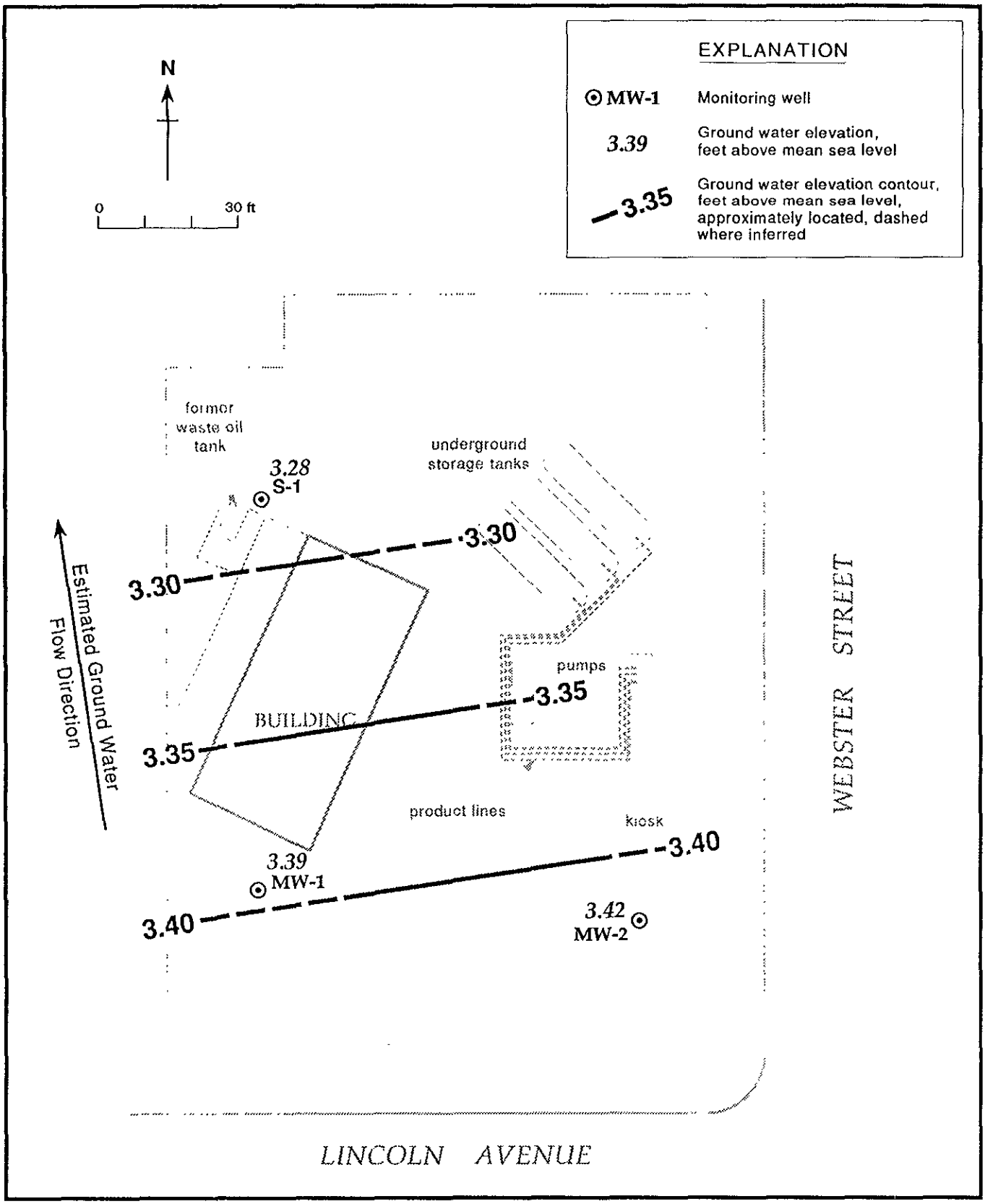

Figure 3. Ground Water Elevation Contours - January 25, 1991 - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California

TABLES

TABLE 1. Ground Water Elevation Data - Shell Service Station WIC #204-0072-0403, 1601 Webster Street Alameda, California

Well ID	Date	Top-of-Casing Elevation (ft above msl)	Depth to Water (ft)	Ground Water Elevation (ft above msl)
MW-1	04-11-90	13.80	8.22	5.58
	07-18-90		9.14	4.66
	10-18-90		10.37	3.43
	01-25-91		10.41	3.39
MW-2	04-11-90	13.20	7.69	5.51
	07-18-90		8.56	4.64
	10-18-90		9.76	3.44
	01-25-91		9.78	3.42
S-1	09-11-90	13.77	9.82	3.95
	04-11-90		8.41	5.36
	07-18-90		9.31	4.46
	10-18-90		10.43	3.34
	01-25-91		10.49	3.28

TABLE 2. Analytic Results for Ground Water - Shell Service Station, WIC #204-0072-0403, 1601 Webster Street, Alameda, California

Sample ID	Date Sampled	Analytic Lab	Depth to Water (ft)	TPH-G	TPH-D	B	E	T	X	c-1,2-DCE	1,2-DCA	TOG	Other
				<----------parts per million (mg/L)---------->									
MW-1	04-11-90	NET	8.22	<0.050	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<10	---
	07-18-90	IT	9.14	<0.050	---	<0.0005	<0.0005	<0.0005	<0.0005	0.003	<0.0005	<5	---
	10-18-90	IT	10.37	<0.050	---	<0.0005	<0.0005	<0.0005	<0.0005	0.0079	<0.0005	<5	---
	01-25-91	IT	10.41	<0.050	---	<0.0005	<0.0005	<0.0005	<0.0005	0.0056	<0.0005	---	---
MW-2	04-11-90	NET	7.69	0.58	0.43	0.020	0.0012	0.0049	0.073	<0.0005	0.0011	<10	---
	07-18-90	IT	8.56	1.4	---	0.11	0.071	0.31	0.31	<0.0005	0.0007	<5	---
	10-18-90	IT	9.76	1.9	1.3[a]	0.11	0.089	0.47	0.40	<0.0005	0.0009	<5	---
	01-25-91	IT	9.78	8.1	---	0.43	0.48	1.2	2.6	<0.0005	0.0008	---	---
S-1	09-04-87[b]	IT	c	---	---	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.0005	---	d
	09-11-89	IT	9.82	<0.050	<0.10	<0.0005	<0.001	<0.001	<0.003	<0.0005	<0.0005	<1	e
	04-11-90	NET	8.41	<0.050	<0.050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<10	---
	07-18-90	IT	9.31	<0.050	---	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<5	---
	10-18-90	IT	10.43	<0.050	---	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<5	---
	01-25-91	IT	10.49	<0.050	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---	---	---
Travel Blank	07-18-90	IT		<0.050	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---	---	---
	10-18-90	IT		<0.050	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---	---	---
	01-25-91	IT		<0.050	---	<0.0005	<0.0005	<0.0005	0.0008	---	---	---	---
DHS MCLs				NE	NE	0.001	0.680	0.100[e]	1.750	0.0060	0.0005	NE	

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, or 8020
E = Ethylbenzene by EPA Method 602, 624, or 8020
T = Toluene by EPA Method 602, 624, or 8020
X = Xylenes by EPA Method 602, 624, or 8020
c-1,2-DCE = cis-1,2-dichloroethylene by EPA Method 601 or 624
1,2-DCA = 1,2-dichloroethane by EPA Method 601 or 624
TOG = Total non-polar oil and grease by American Public Health Association Standard Method 503E
<n = Not detected at detection limit of n ppm
DHS MCL = Department of Health Services Maximum Contaminant Level
NE = DHS action levels not established
--- = Not analyzed

Analytical Laboratory:

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

Notes:

[a] = Compounds detected and calculated as diesel appear to be the less volatile constituents of gasoline.
[b] = Sampled by Pacific Environmental Group, Santa Clara, California
[c] = Depth to water measurement not available
[c] = Acetone detected at 0.12 ppm by EPA Method 624; no other volatile organic compounds detected
[d] = Analyzed for metals by EPA Method 6010: cadmium <0.010 ppm; chromium, 0.020 ppm; lead, 0.060 ppm; zinc, 0.030 ppm; and analyzed for PCBs (<0.0005 ppb) and semi-volatile organic compounds (<0.010-0.050 ppm) by EPA Method 625.
[e] = DHS recommended action level for drinking water, MCL not established

TABLE 3. Modifications to Ground Water Sampling Schedule, Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California

Well ID	Current Sampling Frequency	Recommended Future Sampling Frequency	Rationale for Recommended Sampling Frequency
MW-1	Quarterly	Annually	No TPH-G or BETX detected for four quarters; cross-gradient well
MW-2	Quarterly	Quarterly	Increasing hydrocarbon concentrations for four quarters
S-1	Quarterly	Semi-Annually	No hydrocarbons detected for four quarters; source area well

ATTACHMENT A

WATER SAMPLE COLLECTION RECORDS

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name MW-1 Date 1/25/91 Time of Sampling 10:35
Job Name Shell Alameda TL Job Number 81-434-01 Initials PC
Sample Point Description M (M = Monitoring Well)
Location ~10' from air water station

WELL DATA: Depth to Water 10.91 ft (static) pumping (a 0835-WCM#4 Depth to Product — ft.
Product Thickness — Well Depth 21.0 ft (spec) Well Depth 20.91 ft(sounded) Well Diameter 4 in
Initial Height of Water in Casing 10.5 ft. = volume 6.85 gal.
4 Casing Volumes to be Evacuated. Total to be evacuated 27.4 gal.

EVACUATION METHOD: Pump # and type — Hose # and type —
Bailer# and type 3"x36" PVC Dedicated Y (Y/N)
Other —

Evacuation Time: Stop 9:27 9:35 9:39
Start 9:18 9:28 9:36
Total Evacation Time 19 min
Total Evacuated Prior to Sampling 13.7/2.14 = 28.0 gal.
Evacuation Rate 1.37 gal. per minute
Depth to Water during Evacuation — ft. — time
Depth to Water at Sampling 10.60 ft. 10:41 time
Evacuated Dry? No 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 Light Tan Odor None
Description of matter in sample: Silt type particles
Sampling Method: Sampling port on side of dedicated 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	011-01	w/cv	40ml	N	Y	HCL	EPA 8015/8020	N	IT
3	011-01	w/cv	40ml	N	Y	HCL	EPA 601	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 1/25/91 Time of Sampling 10:35
Job Name Shell Alameda #F Job Number 81-434.01 Initials BB
Sample Point Description M (M = Monitoring Well)
Location BEHIND KIOSK, IN MIDDLE OF LOT

WELL DATA: Depth to Water 9.78 ft (static) pumping) @0844, WCN#4 Depth to Product — ft
Product Thickness — Well Depth 20 ft (spec) Well Depth 20.09 ft(sounded) Well Diameter 4 in
Initial Height of Water in Casing 10.31 ft. = volume 6.73 gal.
4 Casing Volumes to be Evacuated. Total to be evacuated 26.9 gal.

EVACUATION METHOD: Pump # and type — Hose # and type —
Bailer# and type 3"x36" PVC Dedicated Y (Y/N)
Other —

Evacuation Time: Stop 9:55 (40) 10:09 10:20 10:26
Start 9:53 10:02 10:12 10:23
Total Evacation Time 17 min
Total Evacuated Prior to Sampling 12+10+3=27 gal.
Evacuation Rate 1.60 gal. per minute
Depth to Water during Evacuation — ft. — time
Depth to Water at Sampling 9.78 ft. 1040 time
Evacuated Dry? No 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.)

Small (~½") "pieces" of film on water, No interface probe to measure

SAMPLE: Color Clear Odor None (BB)
Description of matter in sample: None
Sampling Method: Sampling port on side of dedicated 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	011-02	w/cv	40ml	N	Y	HCl	EPA 8015/8020	N	IT
2	011-02	w/cv	40ml	N	Y	HCl	EPA 601	N	IT

Samples to be put on hold pending decision by E.A. to Analyze

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 5-1 Date 1/26/91 Time of Sampling 1007
Job Name Shell Alameda Ft Job Number 81-434-01 Initials BB
Sample Point Description M (M = Monitoring Well)
Location ON RIGHT SIDE OF BLDG, NEAR BATHROOMS & DUMPSTER

WELL DATA: Depth to Water 10.49 ft (static) pumping @ 0.85 GPM Depth to Product — ft.
Product Thickness — Well Depth 20 ft (spec) Well Depth 19.99 ft (sounded) Well Diameter 3 in
Initial Height of Water in Casing 9.5 ft. = volume 3.48 gal.
4 Casing Volumes to be Evacuated. Total to be evacuated 13.9 gal.

EVACUATION METHOD: Pump # and type — Hose # and type —
Bailer# and type 1" x 48" PVC Dedicated Y (Y/N)
Other —

Evacuation Time: Stop 0937 1005 —
Start 0920 0947 —
Total Evacation Time 35 min
Total Evacuated Prior to Sampling 14 gal.
Evacuation Rate 0.40 gal. per minute
Depth to Water during Evacuation — ft. — time
Depth to Water at Sampling 13.48 ft. 1012 time
Evacuated Dry? NO 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.)
		N/A			

SAMPLE: Color CLEAR Odor NONE
Description of matter in sample: NONE
Sampling Method: DECANTED FROM DEDICATED PVC 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	011-51	W/CV	40ml	N	Y	HCL	EPA 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:

TRAVEL BLANKS

WEISS ASSOCIATES

WATER SAMPLING DATA

Well Name 011-21 Date 1/25/91 Time of Sampling ~~0830~~ 0800

Job Name Shell Alameda II Job Number 81-434-01 Initials PC

Sample Point Description —— (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 _____ Odor _____

Description of matter in sample: _____

Sampling Method: _____

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	011-21	w/cv	40ml	N	Y	(PU) HCl ~~EPA 8015/8020~~	EPA 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: 02/13/91

Work Order: T1-01-271

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

This is the Certificate of Analysis for the following samples:

Client Work ID: 81-434-01 1601 Webster St. Al
Date Received: 01/28/91
Number of Samples: 4
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

Reviewed and Approved:

Suzanne Veaudry
Project Manager

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 02/13/91
Client Work ID: 81-434-01 1601 Webster St. Al

Work Order: T1-01-271

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

SAMPLE ID: **011-01**
SAMPLE DATE: **01/25/91**
LAB SAMPLE ID: **T101271-01**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool**
EXTRACTION DATE: **N/A**
ANALYSIS DATE: **02/06/91**

RESULTS in Milligrams per Liter

PARAMETER	DETECTION LIMIT	DETECTED
Bromodichloromethane	0.0005	None
Bromoform	0.0005	None
Bromomethane	0.0005	None
Carbon tetrachloride	0.0005	None
Chlorobenzene	0.0005	None
Chloroethane	0.0005	None
Chloroform	0.0005	None
Chloromethane	0.0005	None
Dibromochloromethane	0.0005	None
1,2-Dichlorobenzene	0.0005	None
1,3-Dichlorobenzene	0.0005	None
1,4-Dichlorobenzene	0.0005	None
Dichlorodifluoromethane	0.0005	None
1,1-Dichloroethane	0.0005	None
1,2-Dichloroethane	0.0005	None
1,1-Dichloroethene	0.0005	None
cis-1,2-Dichloroethene	0.0005	0.0056
trans-1,2-Dichloroethene	0.0005	None
1,2-Dichloropropane	0.0005	None
cis-1,3-Dichloropropene	0.0005	None
trans-1,3-Dichloropropene	0.0005	None
Methylene chloride	0.0005	None
1,1,2,2-Tetrachloroethane	0.0005	None
Tetrachloroethene	0.0005	None
1,1,1-Trichloroethane	0.0005	None
1,1,2-Trichloroethane	0.0005	None
Trichloroethene	0.0005	None
Trichlorofluoromethane	0.0005	None
1,1,2-Trichlorotrifluoroethane	0.0005	None
Vinyl chloride	0.0005	None

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 02/13/91
Client Work ID: 81-434-01 1601 Webster St. Al

Work Order: T1-01-271

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **011-01**
SAMPLE DATE: **01/25/91**
LAB SAMPLE ID: **T101271-01**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		02/02/91
Low Boiling Hydrocarbons	Mod.8015		02/02/91

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**

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 02/13/91
Client Work ID: 81-434-01 1601 Webster St. Al

Work Order: T1-01-271

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

SAMPLE ID: **011-02**
SAMPLE DATE: **01/25/91**
LAB SAMPLE ID: **T101271-02**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool**
EXTRACTION DATE: **N/A**
ANALYSIS DATE: **02/04/91**

RESULTS in Milligrams per Liter

PARAMETER	DETECTION LIMIT	DETECTED
Bromodichloromethane	0.0005	None
Bromoform	0.0005	None
Bromomethane	0.001	None
Carbon tetrachloride	0.0005	None
Chlorobenzene	0.0005	None
Chloroethane	0.0005	None
Chloroform	0.0005	None
Chloromethane	0.0005	None
Dibromochloromethane	0.0005	None
1,2-Dichlorobenzene	0.0005	None
1,3-Dichlorobenzene	0.0005	None
1,4-Dichlorobenzene	0.0005	None
Dichlorodifluoromethane	0.0005	None
1,1-Dichloroethane	0.0005	None
1,2-Dichloroethane	0.0005	0.0008
1,1-Dichloroethene	0.0005	None
cis-1,2-Dichloroethene	0.0005	None
trans-1,2-Dichloroethene	0.0005	None
1,2-Dichloropropane	0.0005	None
cis-1,3-Dichloropropene	0.0005	None
trans-1,3-Dichloropropene	0.0005	None
Methylene chloride	0.0005	None
1,1,2,2-Tetrachloroethane	0.0005	None
Tetrachloroethene	0.0005	None
1,1,1-Trichloroethane	0.0005	None
1,1,2-Trichloroethane	0.0005	None
Trichloroethene	0.0005	None
Trichlorofluoromethane	0.002	None
1,1,2-Trichlorotrifluoroethane	0.0005	None
Vinyl chloride	0.0005	None

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 02/13/91
Client Work ID: 81-434-01 1601 Webster St. Al

Work Order: T1-01-271

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **011-02**
SAMPLE DATE: **01/25/91**
LAB SAMPLE ID: **T101271-02**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		02/05/91
Low Boiling Hydrocarbons	Mod.8015		02/05/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	1.0	8.1
BTEX		
Benzene	0.01	0.43
Toluene	0.01	1.2
Ethylbenzene	0.01	0.48
Xylenes (total)	0.01	2.6

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 02/13/91
Client Work ID: 81-434-01 1601 Webster St. Al

Work Order: T1-01-271

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **011-S1**
SAMPLE DATE: **01/25/91**
LAB SAMPLE ID: **T101271-03**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		02/05/91
Low Boiling Hydrocarbons	Mod.8015		02/05/91

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

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 02/13/91
Client Work ID: 81-434-01 1601 Webster St. Al

Work Order: T1-01-271

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **011-21**
SAMPLE DATE: **01/25/91**
LAB SAMPLE ID: **T101271-04**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		02/03/91
Low Boiling Hydrocarbons	Mod.8015		02/03/91

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	**0.0008**

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 02/13/91
Client Work ID: 81-434-01 1601 Webster St. Al

Work Order: T1-01-271

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 **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.

T1-01-271

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

Shell Service Station Address:
1601 WEBSTER STREET
ALAMEDA, CALIFORNIA

Shell Contact: KURT MILLER
WIC #: 204-0072-0403
AFE #: 986647

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

Project ID: 81-434-01

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: BRIAN BUSCH/PAUL CARDOZA 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
3 (ABC)	011-01	W/CV	1/25/91	40ml	No	Yes	HCl	TPH-6/BETX	EPA 8015/8020	N	DIC COOL (JP)
3 (DEF)	011-01	"	"	"	"	"	"	HVOC's	EPA 601	"	
3 (GAB)	011-02	"	"	"	"	"	"	TPH-6/BETX	EPA 8015/8020	"	Hold
3 (DEF)	011-02	"	"	"	"	"	"	HVOC's	EPA 601	"	Hold
3 (ABC)	011-S1	"	"	"	"	"	"	TPH-6/BETX	EPA 8015/8020	"	
4 (ABC)	011-21	"	"	"	"	"	"	TPH-G/BETX	EPA 8015/8020	"	

PENDING ANALYTICAL RESULTS

1 Brian Busch 1/25/91
Released by (Signature), Date

1 WEISS ASSOCIATES
Affiliation

2 [signature] 1/28/91
Received by (Signature), Date

2 WEISS ASSOC.
Affiliation

3 [signature] 1/28/91
Released by (Signature), Date

3 WEISS ASSOC.
Affiliation

4 [signature] 1/28/91 1320
Shipping Carrier, Method, Date

4 IT CORP
Affiliation

5 [signature] 1/28/91 1910
Released by (Signature), Date

5 IT CORP
Affiliation

6 Jason J. Koch 1/28/91 1910
Received by Lab Personnel, Date

6 (TAS 943-1540
Affiliation, Telephone

x yes
Seal intact?

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:
→ SAMPLES WERE STORED OVER THE WEEKEND IN A SECURE, LOCKED PLACE WITH CUSTODY TAPE ATTACHED. (BB)

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ATTACHMENT C

PREVIOUS GROUND WATER ELEVATION CONTOUR MAPS

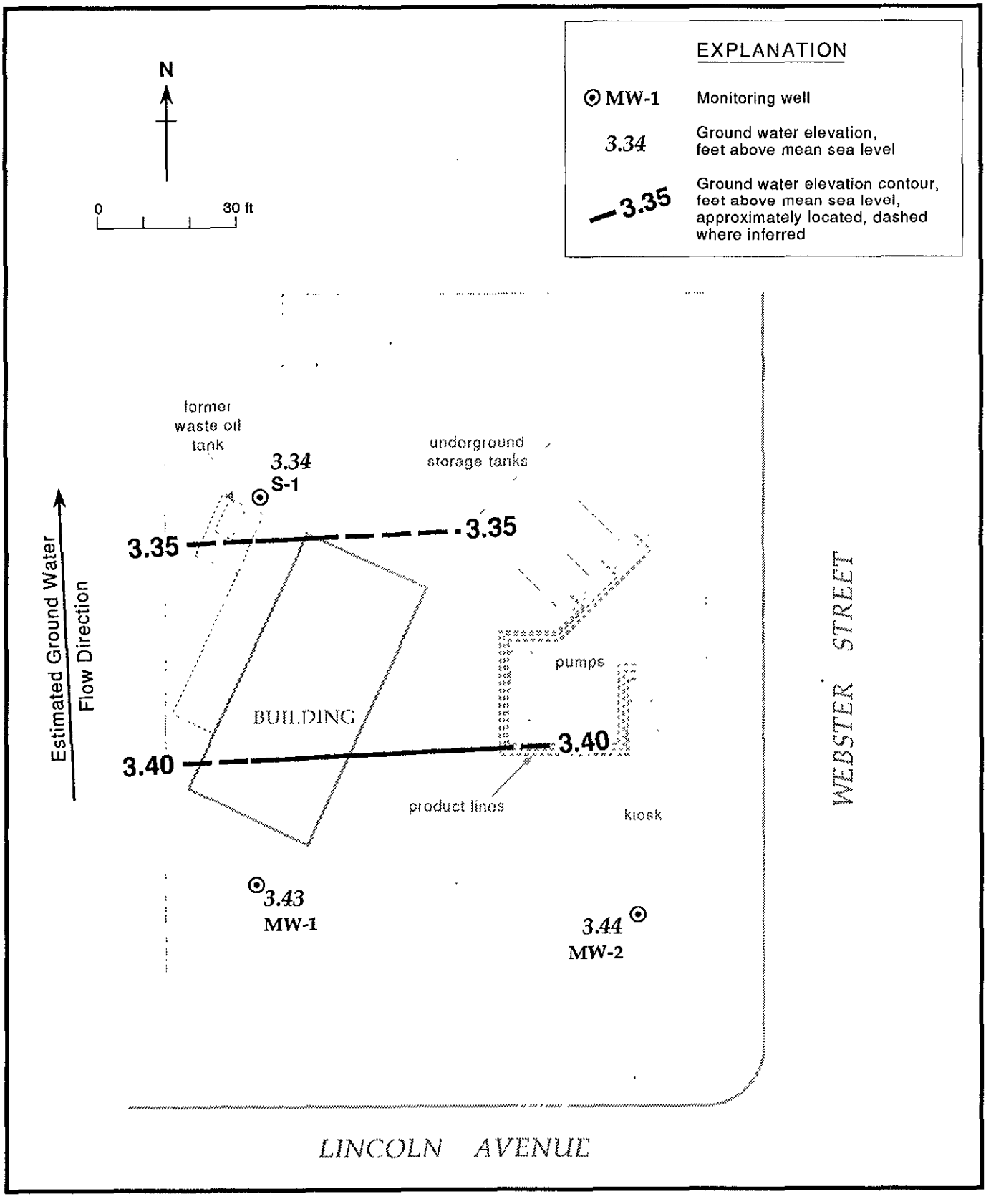

Figure 2. Monitoring Well Locations and Ground Water Elevation Contours - October 18, 1990 - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California

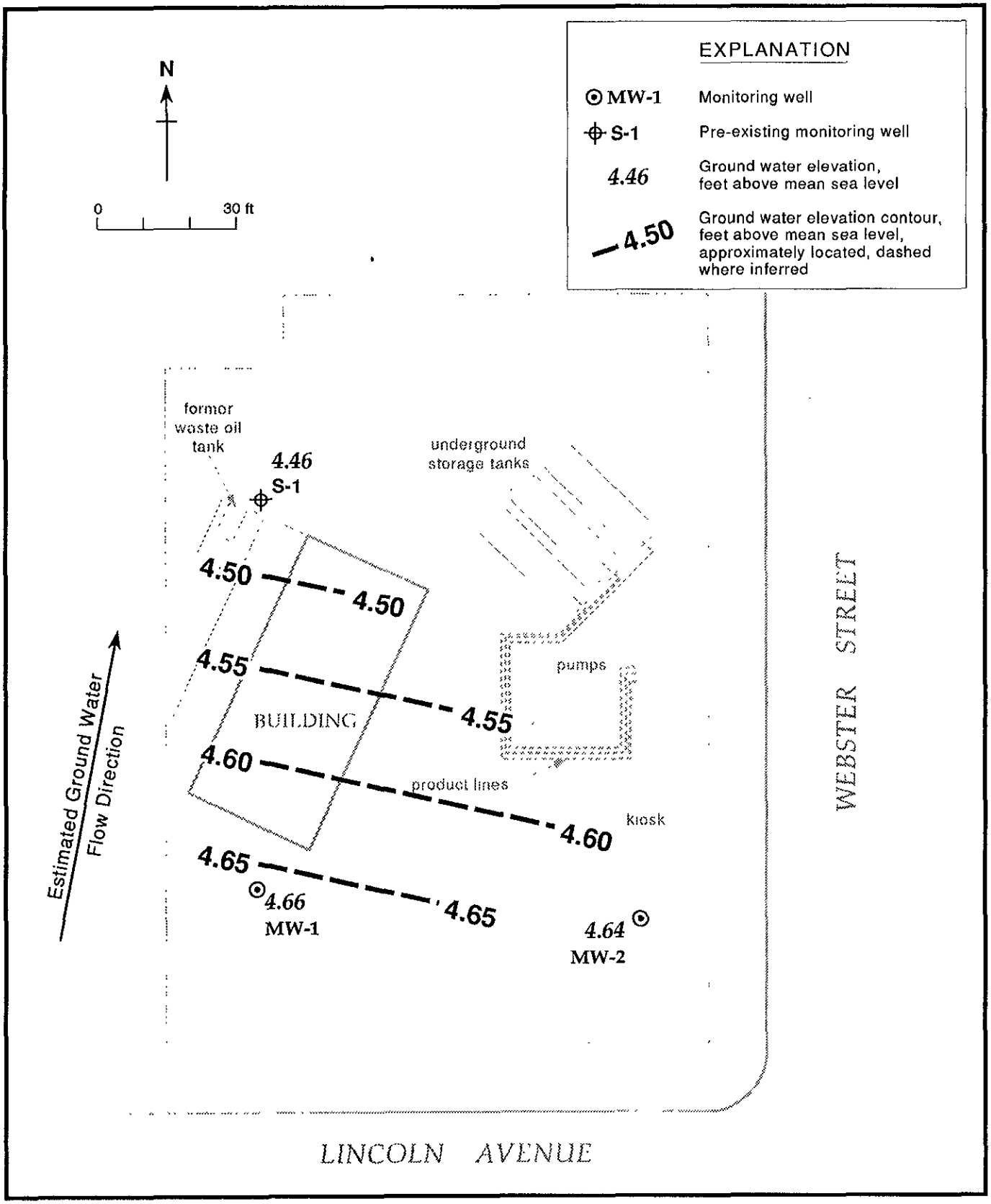

Figure 2. Monitoring Well Locations and Ground Water Elevation Contours - July 18, 1990 - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California

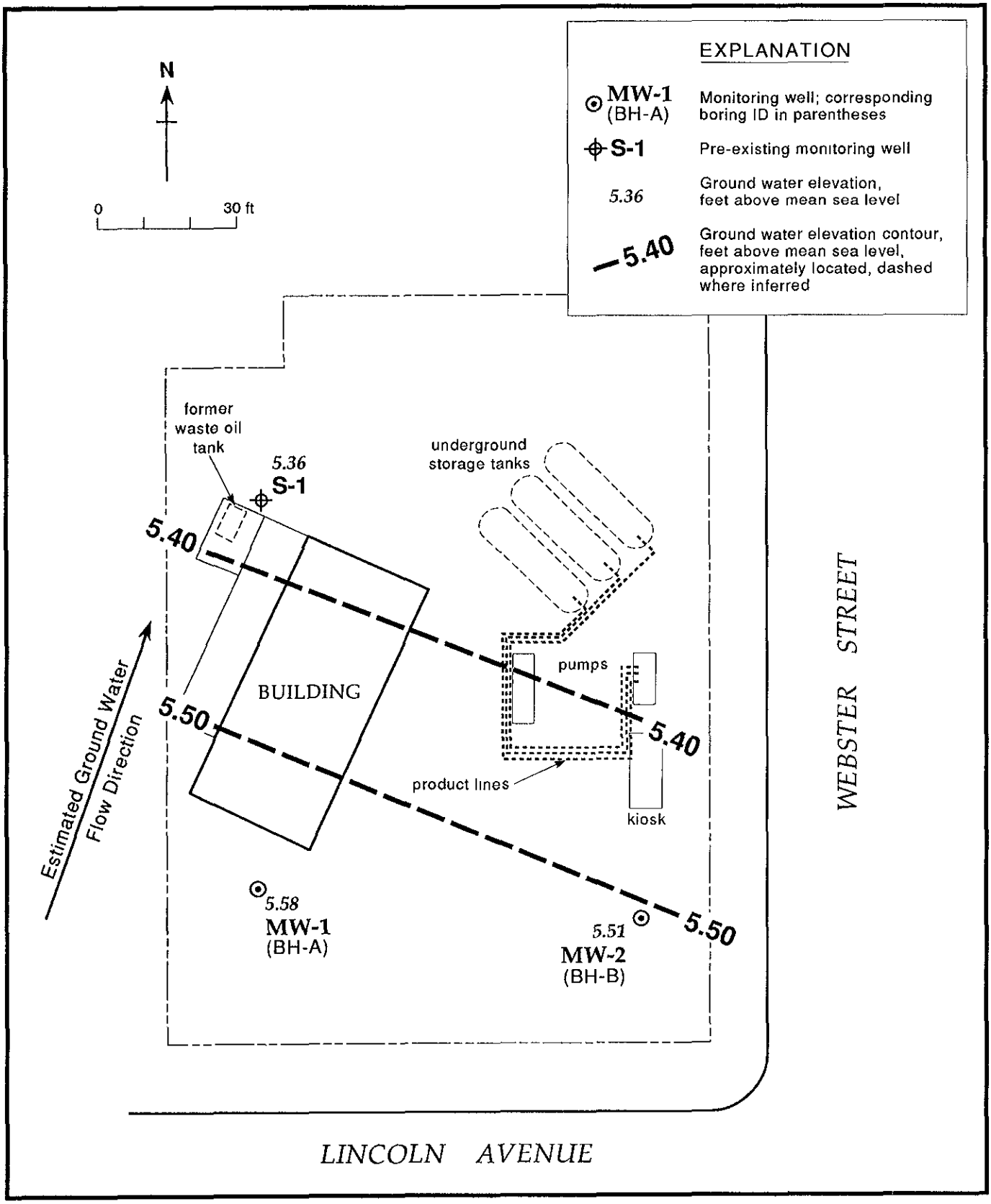

Figure 3. Monitoring Well Locations and Ground Water Elevation Contours - April 11, 1990 - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California

1/14/91

ATTACHMENT D

SAMPLING FREQUENCY MODIFICATION CRITERIA

ATTACHMENT D

SAMPLING FREQUENCY MODIFICATION CRITERIA

Shell typically samples ground water on a quarterly basis at their operating or former service stations. The California Water Quality Control Board's ground water monitoring guidelines state that: "Quarterly (ground water) monitoring is the maximum sampling interval typically allowed when ground water contamination is present unless other arrangements are made with Regional Water Quality Control Board staff"[1]. California Regional Water Quality Control Board - San Francisco Bay Region (RWQCB-SFBR) personnel have indicated that the board will allow reduction of the sampling frequency on a site-specific basis if the frequency modification is justified by site conditions. Therefore, WA has developed generalized criteria for determining when sampling frequency can be modified.

The recommended sampling frequency for specific monitoring wells is based upon the following factors:

- The reliability of the ground water quality analytic data,
- The trend of the dissolved hydrocarbon concentration in water samples from the well, and
- The location of the well in relation to the hydrocarbon source.

Each of these factors is discussed below.

Reliability of Ground Water Quality Analytic Data

Since the reproducibility of ground water analytic data is highly sensitive to hydrogeologic conditions as well as field sampling and laboratory analytic procedures, ground water analytic data often shows variability between sampling episodes. Seasonal ground water elevation fluctuations can also affect hydrocarbon concentrations in ground water. Therefore, WA will reduce the sampling frequency only for wells that:

- Have been sampled quarterly for at least one year, and
- Have consistent historical analytic results allowing a reliable assessment of hydrocarbon concentrations in the well. If the variability of the analytic data prevents a reliable assessment of hydrocarbon concentrations, then we will continue to sample the well(s) quarterly until a reliable assessment can be made.

---

1 North Coast, San Francisco Bay, Central Valley Regional Water Quality Control Boards, June 2, 1988 (revised May 18, 1989), "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks; pg.12.

Trend of Hydrocarbon Concentration

Sampling frequency will be reduced only for wells showing stable or decreasing hydrocarbon concentrations. Wells with increasing concentration trends will be sampled quarterly to monitor the trends and determine whether the hydrocarbon concentration in a particular well is approaching a threshold concentration such as the saturation concentration, maximum contaminant level (MCL) for drinking water or a California Department of Health Services action level.

Well Location

Ground water monitoring wells generally fall into one of the following classifications relative to the suspected hydrocarbon source:

1) Clean up- and cross-gradient wells,

2) Clean down-gradient wells,

3) High concentration source-area wells, and

4) Low to high concentration intermediate wells.

WA recommends the following sampling frequency for each of these classifications:

1) If no offsite source is indicated by the initial sampling of the up-gradient and cross-gradient site wells, and if no hydrocarbons are detected in water samples from the wells, WA recommends sampling these wells annually.

2) Since clean down-gradient wells define the "leading edge" of dissolved hydrocarbons in ground water and hence are used to monitor hydrocarbon breakthrough, WA recommends sampling these wells quarterly.

3) High hydrocarbon concentration source-area wells are used to monitor source-area hydrocarbon concentrations and the effectiveness of natural biodegradation. WA recommends sampling these wells semi-annually unless the hydrocarbon concentrations are increasing, in which case the wells will be sampled quarterly. High hydrocarbon concentration source area wells with a history of floating hydrocarbons will be inspected at least quarterly, and sampled if possible.

4) Intermediate wells are located at a distance from the source area and may contain low to high dissolved hydrocarbon concentrations, depending on their distance from the source and hydrogeologic factors. Although these wells are not used to track the migration of the dissolved-hydrocarbon front, they can be used to track the migration of the dissolved hydrocarbon plume and the rates of natural biodegradation. Therefore, WA recommends sampling these wells semi-annually.

FILE

WEISS ASSOCIATES
Fax: 415-547-5043 Phone: 415-547-5420
Geologic and Environmental Services 3500 Shellmound Street, Emeryville, CA 94608

91 MAR -7 AM 11: 37

TRANSMITTAL LETTER

FROM: Tom Fojut

DATE: March 5, 1991

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

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

SUBJECT: Shell Service Station
WIC #204-0072-0403
1601 Webster Street
Alameda, California

JOB: 81-434-01

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.

D:\ALL\TRANS\JA1.WP