Weiss Associates Environmental and Geologic Services

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August 17, 1992

Ms. Juliet Shin
Alameda County Department of
Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, CA 94621

Re: STID #3014
Shell Service Station
1601 Webster Street
Alameda, California
WA Job #81-434-100

Dear Ms. Shin:

On behalf of Shell Oil Company, Weiss Associates (WA) has prepared this letter in response to your June 17, 1992 letter to Dan Kirk of Shell requesting a subsurface investigation and remediation workplan for the station referenced above. We have reviewed the results of previous subsurface investigations and quarterly ground water monitoring events to assess the scope of future investigations. A summary of the site background and our recommendations are presented below.

SITE BACKGROUND

Waste Oil Tank Removal: In June 1987 a 550-gallon underground waste oil tank originally installed in 1962 was removed (Figure 1). Blaine Tech Services (BTS) of San Jose, California reported that the tank contained more than 77 holes and that a hydrocarbon sheen was observed on the water in the excavation.[1] Soil collected from 9.5 ft depth in the excavation contained 133 parts per million (ppm) petroleum oil and grease (POG), 14 ppm total petroleum

1 BTS, June 26, 1989, Consultant's letter-report presenting a summary of previously unpublished notes from the 1987 waste oil tank removal at the Shell service station at 1601 Webster Street in Alameda, California, prepared for Shell Oil Company, 19 pages.

hydrocarbons (TPH) and 29 ppm 1,1,1-trichloroethane (TCA).[2] A grab water sample collected from the subsurface at about 12.5 ft depth contained 244 ppm POG, 132 ppm TPH, 11 ppm TCA and 59 ppm methylene chloride.

Well S-1 Installation: In September 1987, Pacific Environmental Group (PEG) of Santa Clara, California installed ground water monitoring well S-1 immediately downgradient of the former waste oil tank to assess whether hydrocarbons detected during the excavation were in ground water (Figure 2).[3] Soil samples collected from 3.5 to 15.5 ft depth in the well boring contained POG, at a maximum of 130 ppm at about 5 ft depth. No halogenated volatile organic compounds (HVOCs) were detected in soil.

Well MW-1 and MW-2 Installations: In April 1990, WA installed wells MW-1 and MW-2.[4] TPH as gasoline (TPH-G) and/or benzene, ethylbenzene, toluene or xylenes were detected in soil from both well borings at a maximum of 32 ppm TPH-G and 0.53 ppm benzene detected below the water table in MW-2. Unsaturated soil from the two borings contained less than 0.1 ppm benzene. No POG or HVOCs were detected in soil from either boring.

Quarterly Ground Water Monitoring: Ground water beneath the site has been sampled quarterly since April 1990.[5,6] Ground water has consistently flowed north-northeastward to north-northwestward. The water table has fluctuated between 6 and 11 ft depth beneath the site. No petroleum hydrocarbons have been detected in ground water samples from wells S-1 and MW-1. However, water samples from well MW-1 have contained up to 0.0079 ppm cis-1,2-dichloroethene, and water samples from well MW-2 have contained up to 16 ppm TPH-G, 0.20 ppm methylene chloride and 0.0011 ppm 1,2-dichloroethane.

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2 BTS, July 16, 1987, Field Sampling at Shell Station, 1601 Webster Street, Alameda, California, consultant's letter-report prepared for Shell, 3 pages plus attachments.

3 PEG, October 23, 1987, Consultant's letter-report regarding a well installation at the Shell service station at 1601 Webster Street in Alameda, California, prepared for Gettler-Ryan, Inc., 3 pages plus attachments.

4 WA, July 6, 1990, Subsurface Investigation at Shell Service Station, 1601 Webster Street, Alameda, California, consultant's report prepared for Shell Oil Company, 17 pages and 3 appendices.

5 WA, December 2, 1991, Consultant's quarterly status report for the Shell service station at 1601 Webster Street in Alameda, California, prepared for the Alameda County Department of Environmental Health (ACDEH), 5 pages plus 4 attachments.

6 WA, July 1, 1992, Consultant's quarterly status report for the Shell service station at 1601 Webster Street in Alameda, California, prepared for the ACDEH, 2 pages and 2 attachments.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the previous tank removal, subsurface investigation and quarterly ground water monitoring, WA concludes that:

- Hydrocarbons and/or HVOCs were detected in soil samples from the former waste oil tank pit, in soil samples from the boring for well S-1 and in a grab ground water sample. However, no hydrocarbons or HVOCs have been detected in ground water samples from well S-1, which is downgradient of the former waste oil tank. This suggests that hydrocarbons and HVOCs from the waste oil tank have not significantly impacted ground water.

- Hydrocarbons and/or HVOCs have been detected in ground water samples from wells MW-1 and MW-2.

- The horizontal extent of hydrocarbons in soil and ground water has not been determined.

During a recent site visit WA noted a repaved trench located crossgradient and slightly upgradient from monitoring well MW-2 (Figure 2). Since the repaved trench may have formerly contained piping to a former pump island, this area could be the source of the hydrocarbons detected in ground water samples from monitoring well MW-2. WA recommends further investigation in the area around the repaved trench.

We propose drilling six to ten soil borings to assess the extent of hydrocarbons in soil and ground water near the trench. WA will collect soil samples from small diameter soil borings drilled about three to four ft below the water table. We will then purge the borings by bailing prior to collecting water samples from each boring. Three of the initial boring locations are shown near monitoring well MW-2 on Figure 2. The subsequent borings will be located to most effectively delineate the source and extent of hydrocarbons in soil and ground water, probably between MW-2 and the repaved area.

Thank you for your consideration. Please call if you have any questions.

Sincerely,
Weiss Associates

N. Scott MacLeod
Project Geologist

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

DCE/NSM/JPT:de

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Attachments: Figures
A - Analytic Results for Soil
B - Analytic Results for Ground Water

cc: Dan Kirk, Shell Oil Company, P.O. Box 5278, Concord, California 94520-9998
Richard Quarante, Alameda Fire Dept., 1300 Park Street, Alameda, California 94501
Richard Hiett, Regional Water Quality Control Board - San Francisco Bay Region, 2101 Webster Street, Suite 500, Oakland, California 94612

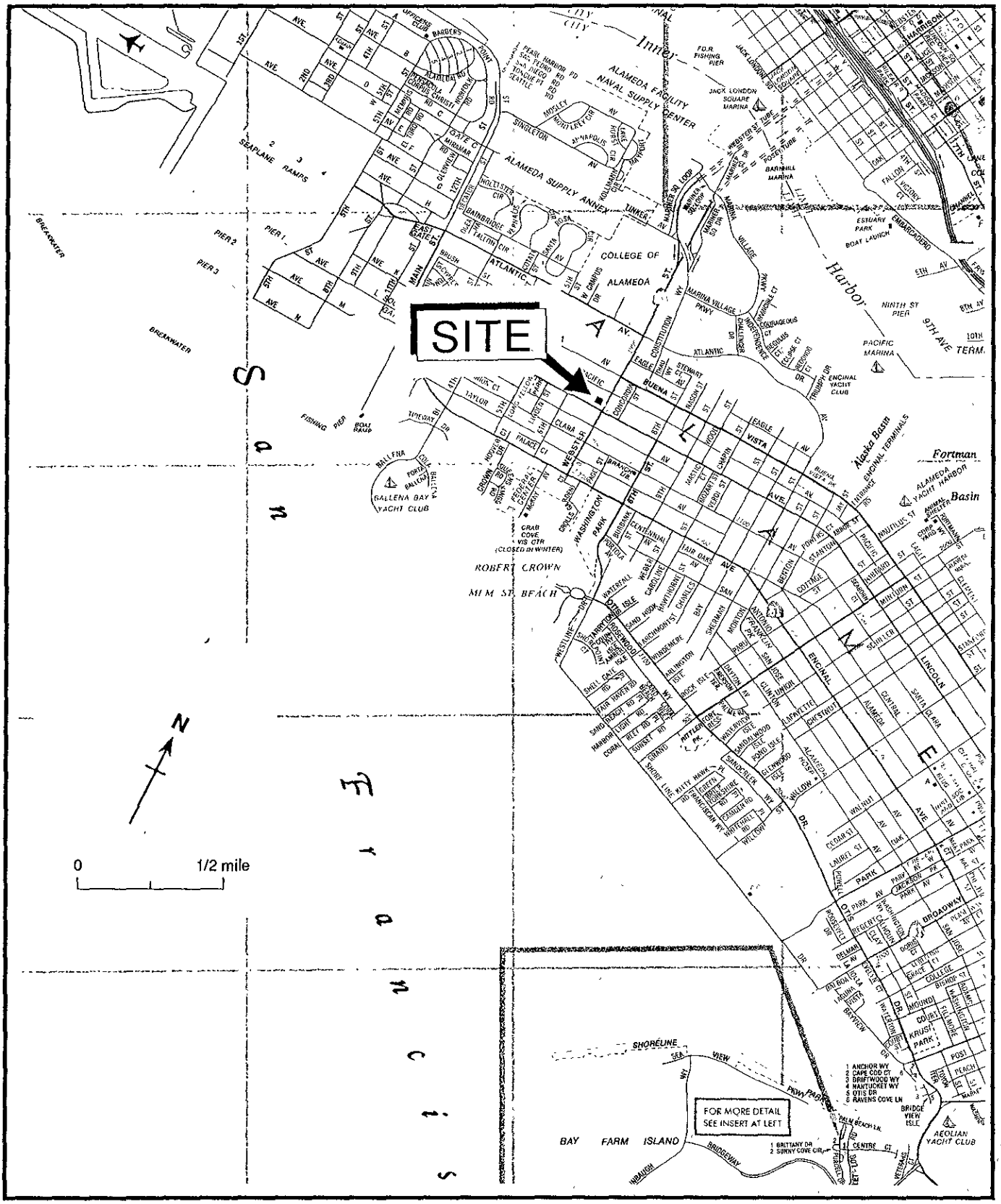

Figure 1. Site Location Map - Shell Service Station, WIC# 204-0072-0403, 1601 Webster Street, Alameda, CA

8/20/90

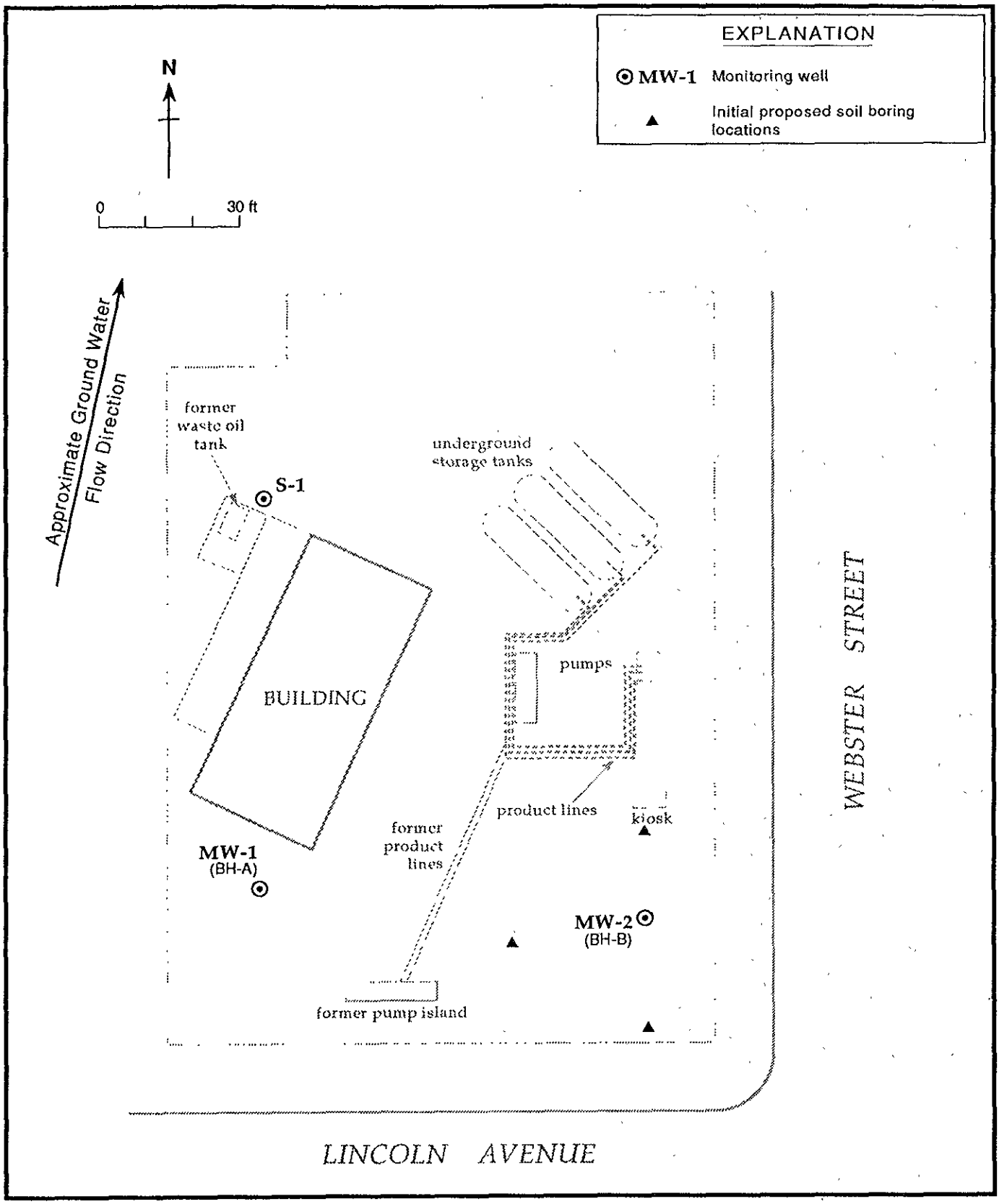

Figure 2. Site Base Map - Shell Service Station WIC #204-0072-0403, 1601 Webster Street, Alameda, California

8/12/92

ATTACHMENT A

ANALYTIC RESULTS FOR SOIL

TABLE 1

Summary of Soil Analytical Results
for Well S-1

High Boiling Hydrocarbons and
Oil and Grease

Depth Interval (feet)	High Boiling (calc. as Oil) (ppm)	Oil and Grease (ppm)
3-1/2 - 5	50	130
9 - 10-1/2	ND	30
14 - 15-1/2	ND	13

Volatile Organic Compounds

9 - 10-1/2 feet - None detected

Notes: ppm - parts per million
ND - not detected, detection limits noted on attached Certified Analytical Reports

Table 2. Results of Soil Analyses - Shell Service Station, WIC #204-0072-0403, 1601 Webster Street, Alameda, California

Soil Boring (Well ID)	Sample Depth (ft)	Date Sampled	Analytic Lab	Analytic Method	Sat/ Unsat	TPH-G	TPH-D*	B	E	T	X	HVOCS	TOG**
						<---------- parts per million (mg/kg) ----------							>
BH-A	4.8	4-3-90	NET	8015/8020	Unsat	<1	---	<0.0025	<0.0025	0.0032	0.0030	---	---
(MW-1)	7.8	4-3-90	NET	8015/8020	Unsat	<1	<1	<0.0025	<0.0025	0.0029	<0.0025	ND[a]	<50
	10.8	4-3-90	NET	8010/503E 8015/8020	Sat	<1	---	0.0026	<0.0025	0.010	0.0037	---	---
BH-B	5.2	4-3-90	NET	8015/8020	Unsat	<1	---	<0.0025	<0.0025	0.0048	0.013	---	---
(MW-2)	6.8	4-3-90	NET	8015/8020	Unsat	1.3	<1	0.0034	0.010	0.017	0.079	ND[a]	<50
	10.2	4-3-90	NET	8010/503E 8015/8020	Sat	20	---	0.530	0.750	3.800	4.000	---	---
	15.2	4-3-90	NET	8015/8020	Sat	32	---	0.15	0.67	1.8	2.6	---	---
	20.2	4-3-90	NET	8015/8020	Sat	<1	---	0.0049	0.0047	0.023	0.029	---	---

Abbreviations:

TPH-G = Total petroleum hydrocarbons as gasoline
TPH-D = Total petroleum hydrocarbons as diesel
B = Benzene
E = Ethylbenzene
T = Toluene
X = Xylenes
HVOCs = Halogenated volatile organic compounds
TOG = Total oil and grease (non-polar)
Sat = Saturated soil sample
Unsat = Unsaturated soil sample
[a] = Not detected at detection limits of 0.002 to 0.05 parts per million (ppm)
<n = Not detected at detection limit of n ppm
* = Analytic results for total petroleum hydrocarbons as motor oil (TPH-MO) are reported with TPH-D results by the laboratory. TPH-MO results are included in the analytic reports in Appendix B.
** = Analytic results for total oil and grease (polar and non-polar) are reported with the hydrocarbon (non-polar) TOG by the laboratory. These results are included in the analytic reports in Appendix B.

Analytical Laboratory:

NET = National Environmental Testing Pacific, Inc., Santa Rosa, California

Analytic Methods:

503E = American Public Health Association Standard Method 503E for TOG
601 = EPA Method 601 for HVOCs
602 = EPA Method 602 for BETX
8015 = Modified EPA Method 8015 for TPH-G, TPH-D and TPH-MO

Analytical Laboratory:

NET = National Environmental Testing Pacific, Inc., Santa Rosa, California

Analytic Methods:

503E = APHA Standard Method 503 for TOG
8010 = EPA Method 8010 (GC/HALL) for HVOCs
8015 = Modified EPA Method 8015 (GC/FID) for TPH-G, TPH-D and TPH-MO
8020 = EPA Method 8020 (GC/PID) for BETX

ATTACHMENT B

ANALYTIC RESULTS FOR GROUND WATER

Table 2
Summary of Analytical Results
Second Quarter 1992
milligrams per liter (mg/l) or parts per million (ppm)

Shell Station: 1601 Webster St.
Alameda, California
WIC #: 204-0072-0403

Date: 05/26/92
Project Number: G67-29.01

Sample Designation	Water Sample Field Date	TPH-g (mg/l)	Benzene (mg/l)	Toluene (mg/l)	Ethyl-benzene (mg/l)	Total Xylenes (mg/l)
MW-1	01/25/91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
MW-1	04/11/91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
MW-1	07/18/91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
MW-1	01/24/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
MW-1	04/23/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
MW-2	01/25/91	8.1	0.43	1.2	0.48	2.6
MW-2	04/11/91	2.6	0.13	0.15	0.25	0.33
MW-2	07/18/91	1.3	0.10	0.059	0.084	0.12
MW-2	01/24/92	7.1	0.45	0.96	0.45	1.6
MW-2	04/23/92	16.	0.32	0.74	0.65	2.6
S-1	01/25/91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
S-1	04/11/91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
S-1	07/18/91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
S-1	01/24/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
S-1	04/23/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
TB	01/25/91	<0.05	<0.0005	<0.0005	<0.0005	0.0008
TB	04/11/91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
TB	07/18/91	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
TB	01/24/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005
TB	04/23/92	<0.05	<0.0005	<0.0005	<0.0005	<0.0005

TPH-g = total petroleum hydrocarbons as gasoline

Table 3
Summary of Analytical Results
Volatile Organic Compounds by EPA Method 601
Second Quarter 1992
milligrams per liter (mg/l) or parts per million (ppm)

Shell Station: 1601 Webster St.
Alameda, California
WIC #: 204-0072-0403

Date: 05/26/92
Project Number: G67-29.01

Sample Designation	Water Sample Field Date	cis-1,2-DCE (mg/l)	1,2-DCA (mg/l)
MW-1	01/25/91	0.0056	<0.0005
MW-1	04/11/91	0.0009	<0.0005
MW-1	07/18/91	0.0044	<0.0005
MW-1	01/24/92	0.0014	<0.0005
MW-1	04/23/92	<0.0005	<0.0005
MW-2	01/25/91	<0.0005	0.0008
MW-2	04/11/91	<0.0005	<0.0005
MW-2	07/18/91	<0.0005	0.0008
MW-2	01/24/92	<0.0005	<0.0005
MW-2	05/20/92	<0.0025	<0.0025
S-1	10/18/90	<0.0005	<0.0005

cis-1,2-DCE = cis-1,2-Dichloroethene
1,2-DCA = 1,2-Dichloroethane

TABLE 3. Analytic Results for Ground Water - Shell Service Station, WIC #204-0072-0403, 1601 Webster Street, Alameda, California

Sample ID	Date Sampled	Depth to Water (ft)	TPH-G	TPH-D	B	E	T	X	c-1,2-DCE	1,2-DCA	TOG
			<----------parts per million (mg/L)---------->								
MW-1	04-11-90[a]	8.22	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<10
	07-18-90	9.14	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	0.003	<0.0005	<5
	10-18-90	10.37	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	0.0079	<0.0005	<5
	01-25-91	10.41	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	0.0056	<0.0005	---
	04-11-91	7.37	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	0.0009	<0.0005	---
	07-18-91	8.86	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	0.0044	<0.0005	---
	10-17-91	10.47	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	0.0072	<0.0005	---
MW-2	04-11-90[a]	7.69	0.58	0.43	0.020	0.0012	0.0049	0.073	<0.0005	0.0011	<10
	07-18-90	8.56	1.4	---	0.11	0.071	0.31	0.31	<0.0005	0.0007	<5
	10-18-90	9.76	1.9	1.3[b]	0.11	0.089	0.47	0.40	<0.0005	0.0009	<5
	01-25-91	9.78	8.1	---	0.43	0.48	1.2	2.6	<0.0005	0.0008	---
	04-11-91	6.87	2.6	---	0.13	0.25	0.15	0.33	<0.0005	<0.0005	---
	07-15-91	8.27	1.3	---	0.10	0.084	0.059	0.12	<0.0005	0.0008	---
	10-17-91	9.89	2.1	---	0.18	0.15	0.26	0.52	<0.0005	0.0006	---
S-1	09-04-87[c]		---	---	<0.005	<0.005	<0.005	<0.005	<0.0005	<0.0005	---
	09-11-89[d]	9.82	<0.05	<0.1	<0.0005	<0.001	<0.001	<0.003	<0.0005	<0.0005	<1
	04-11-90[a]	8.41	<0.05	<0.05	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<10
	07-18-90	9.31	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<5
	10-18-90	10.43	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<5
	01-25-91	10.49	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---	---
	04-11-91	7.68	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---	---
	07-18-91	8.95	<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---	---
	10-17-91	10.62	<0.05	---	<0.0005	<0.0005	<0.0005	<0.005	---	---	---
Trip Blank	07-18-90		<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---	---
	10-18-90		<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---	---
	01-25-91		<0.05	---	<0.0005	<0.0005	<0.0005	0.0008	---	---	---
	04-11-91		<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---	---
	07-18-91		<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---	---
	10-17-91		<0.05	---	<0.0005	<0.0005	<0.0005	<0.0005	---	---	---
DHS MCLs			NE	NE	0.001	0.680	0.10[e]	1.750	0.0060	0.0005	NE

-- Table 3 continues on next page --

TABLE 3. Analytic Results for Ground Water - Shell Service Station, WIC #204-0072-0403, 1601 Webster Street, Alameda, California (continued)

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-dichloroethene 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 = California Department of Health Services maximum contaminant level for drinking water
NE = Not established
--- = Not analyzed

Analytical Laboratory:

International Technology Analytical Services, San Jose, California

Notes:

a = Samples analyzed by National Environmental Testing Pacific, Inc., Santa Rosa, California
b = Compounds detected and calculated as diesel appear to be the less volatile constituents of gasoline.
c = Sampled by Pacific Environmental Group, Santa Clara, California; 0.12 ppm acetone detected by EPA Method 624; no other volatile organic compounds detected
d = Metals detected by EPA Method 6010; 0.020 ppm chromium, 0.060 ppm lead and 0.030 ppm zinc; no cadmium detected above detection limit of 0.010 ppm; no PCBs or semi-volatile compounds detected by EPA Method 625.
e = DHS recommended action level for drinking water; MCL not established