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TO: Mr. Barney Chan
Alameda County Health Care Services
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

DATE: June 17, 1993
PROJECT NUMBER: 69038.12
SUBJECT: ARCO Station No. 4494

FROM: John C. Young

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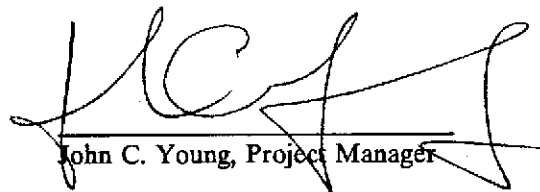
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1 6/17/93	Final First Quarter 1993 Groundwater Monitoring Report at ARCO Station No. 4494, 566 Hegenberger Road, Oakland, California.

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Copies: 1 to RESNA project file no. 69038.12


John C. Young, Project Manager

3315 Almaden Expressway, Suite 34
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LETTER REPORT
QUARTERLY GROUNDWATER MONITORING
First Quarter 1993
at
ARCO Station 4494
566 Hegenberger Road
Oakland, California

69038.12

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June 17, 1993
0617MWHE
69038.12

Mr. Michael Whelan
ARCO Products Company
P.O. Box 5811
San Mateo, California 94402

Subject: First Quarter 1993 Groundwater Monitoring Report at ARCO Station 4494,
566 Hegenberger Road, Oakland, California.

Mr. Whelan:

As requested by ARCO Products Company (ARCO), RESNA Industries Inc. (RESNA) prepared this letter report which constitutes the first quarter 1993 groundwater monitoring at the above-referenced site. Quarterly groundwater monitoring was not performed, due to ongoing construction activities at the site related to removal and replacement of underground gasoline storage tanks (USTs).

The operating ARCO Station 4494 is located on the northeastern corner of the intersection of Edes Avenue and Hegenberger Road in Oakland, California as shown on the Site Vicinity Map, Plate 1. The locations of the groundwater monitoring wells and pertinent site features are shown on the Generalized Site Plan, Plate 2.

In December 1992, groundwater monitoring well MW-2 was properly destroyed during removal activities of the former underground gasoline storage tanks (USTs) at the site. Other previous work associated with the subject site is listed in prior subsurface investigation reports listed in the references section.

Groundwater Sampling and Gradient Evaluation

Depth to water (DTW) level measurements and quarterly groundwater sampling were not performed in monitoring wells MW-1, and MW-3 through MW-7 this quarter due to ongoing construction activities at the site. These construction activities included: replacement of new

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USTs, over-excavation of gasoline impacted soils, backfilling the former UST pit, and the construction of new pump islands and an AM/PM Mini-Market/Station building. It is anticipated that the station is anticipated to open late second quarter or early third quarter 1993, at which time quarter monitoring will resume. RESNA has included Table 1, Cumulative Groundwater Monitoring Data; Tables 2 and 3, Cumulative Results of Laboratory Analyses of Water Samples; and Table 4, Approximate Cumulative Product Recovered to summarize previous quarterly groundwater monitoring events at the site.

Further discussion and results related to UST removal and replacement activities at the site will be presented in a forthcoming report.

Distribution

It is recommended that copies of this report be forwarded to:

Mr. Barney Chan
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

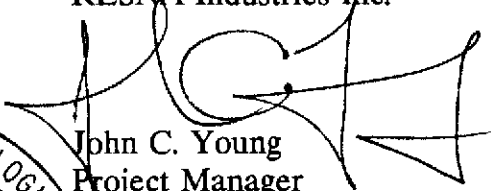
Mr. Richard Hiatt
Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, California 94612

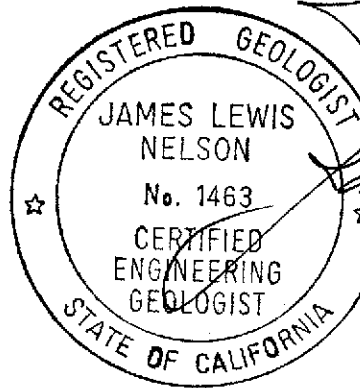
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If you have any questions or comments, please call us at (408) 264-7723.

Sincerely,
RESNA Industries Inc.


John C. Young
Project Manager




James L. Nelson
Certified Engineering
Geologist No. 1463

Enclosures: References

- Plate 1: Site Vicinity Map
- Plate 2: Generalized Site Plan

- Table 1: Cumulative Groundwater Monitoring Data
- Table 2: Cumulative Results of Laboratory Analyses of Water Samples--
TPHg, TPHd, BTEX, and TOG
- Table 3: Cumulative Results of Laboratory Analyses of Water Samples--
BNAs, VOCs, and Metals
- Table 4: Approximate Cumulative Product Recovered

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REFERENCES

- Applied GeoSystems. October 1, 1990. Report on Site History and Limited Environmental Records Review at ARCO Station 4494, 566 Hegenberger Road, Oakland, California. AGS Report 69038-3.
- Applied GeoSystems. February 8, 1991. Letter Report on Fourth Quarter 1990 Ground-Water Monitoring at ARCO Station 4494, 566 Hegenberger Road, Oakland, California. AGS Report 69038-4.
- Applied GeoSystems. February 13, 1991. Limited Subsurface Environmental Investigation at ARCO Station 4494, 566 Hegenberger Road, Oakland, California. AGS Report 69038-2.
- Applied GeoSystems. April 30, 1991. Letter Report on Quarterly Ground-Water Monitoring, First Quarter 1991, at ARCO Station 4494, 566 Hegenberger Road, Oakland, California. AGS Report 69038-4.
- Department of Health Services, State of California. October 24, 1990. Summary of California Drinking Water Standards.
- Pacific Environmental Group. May 3, 1989. Arco Station No. 4494, 566 Hegenberger Road, California. Project 330-41.
- RESNA/Applied GeoSystems. September 12, 1991. Letter Report on Quarterly Ground-Water Monitoring, Second Quarter 1991, at ARCO Station 4494, 566 Hegenberger Road, Oakland, California. AGS Report 69038-4.
- RESNA. November 22, 1992. Letter Report on Quarterly Groundwater Monitoring, Third Quarter 1991, at ARCO Station 4494, 566 Hegenberger Road, Oakland, California. RESNA Report 69038.04.
- RESNA. April 8, 1992. Letter Report on Quarterly Groundwater Monitoring, Fourth Quarter 1991, at ARCO Station 4494, 566 Hegenberger Road, Oakland, California. RESNA Report 69038.04.
- RESNA. May 8, 1992. Letter Report on Quarterly Groundwater Monitoring, First Quarter 1992 at ARCO Station 4494, 566 Hegenberger Road, Oakland, California. RESNA Report 69038.11

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REFERENCES
(continued)

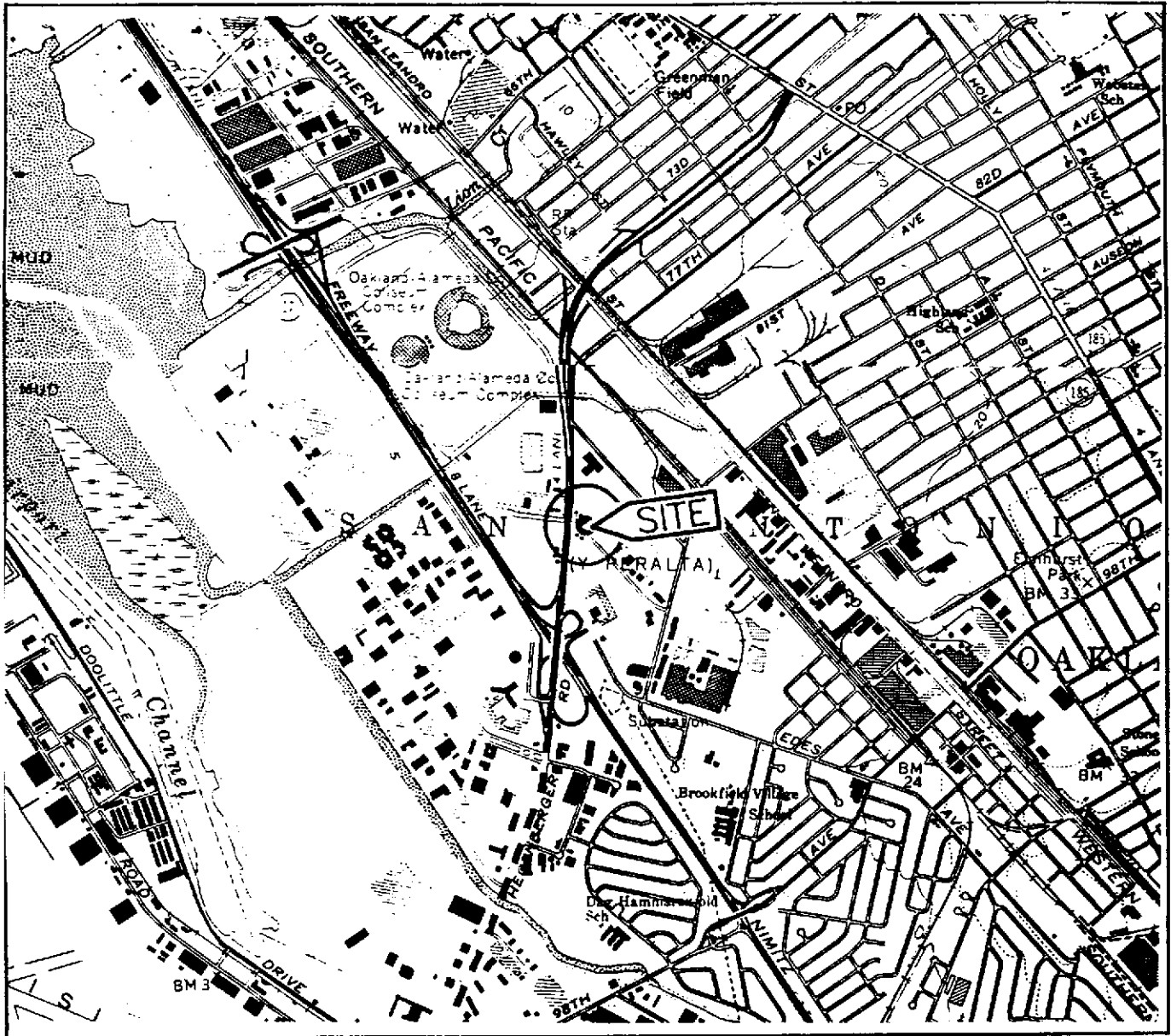
RESNA. September 3, 1992. Letter Report on Quarterly Groundwater Monitoring, Second Quarter 1992 at ARCO Station 4494, 566 Hegenberger Road, Oakland, California. RESNA Report 69038.11.

RESNA. October 29, 1992. Additional Subsurface Investigation at ARCO Station 4494, 566 Hegenberger Road in Oakland, California. RESNA Report 69038.10.

RESNA. November 30, 1992. Letter Report on Quarterly Groundwater Monitoring, Third Quarter 1992 at ARCO Station 4494, 566 Hegenberger Road in Oakland, California. RESNA Report 69038.11.

RESNA. December 31, 1992. Addendum to Work Plan to Construct an Interim Slurry Wall at ARCO Station 4494, 566 Hegenberger Road in Oakland, California. RESNA Report 69038.13.

RESNA. March 9, 1993. Letter Report on Quarterly Groundwater Monitoring, Fourth Quarter 1992 at ARCO Station 4494, 566 Hegenberger Road in Oakland, California. RESNA Report 69038.12.



Base: U.S. Geological Survey
 7.5-Minute Quadrangles
 Oakland East/San Leandro, California.
 Photorevised 1980

LEGEND

● = Site Location



Approximate Scale



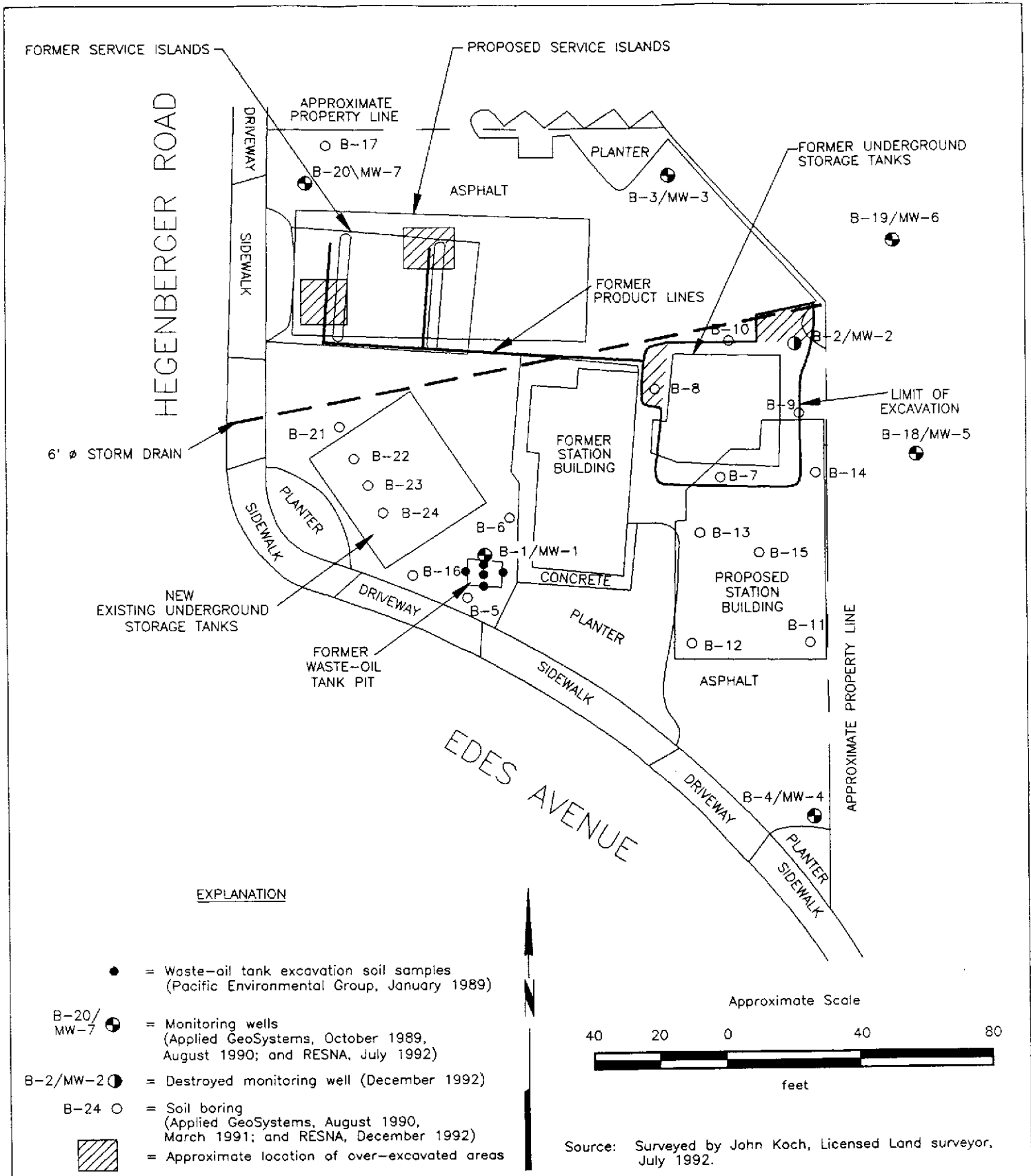
RESNA
 Working to Restore Nature

SITE VICINITY MAP
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

PLATE

1

PROJECT 69038.12



EXPLANATION

- = Waste-oil tank excavation soil samples (Pacific Environmental Group, January 1989)
- B-20/MW-7 ● = Monitoring wells (Applied GeoSystems, October 1989, August 1990; and RESNA, July 1992)
- B-2/MW-2 ● = Destroyed monitoring well (December 1992)
- B-24 ○ = Soil boring (Applied GeoSystems, August 1990, March 1991; and RESNA, December 1992)
- ▨ = Approximate location of over-excavated areas

Source: Surveyed by John Koch, Licensed Land surveyor, July 1992.

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PROJECT 69038.12

GENERALIZED SITE PLAN
ARCO Service Station 4494
566 Hegenberger Road
Oakland, California

PLATE

2

Quarterly Groundwater Monitoring
ARCO Station 4494, Oakland, California

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 4494
Oakland, California
(Page 1 of 4)

<u>Well</u> Date	Elevation of Wellhead	Depth to Water	Water Elevation	Floating Product
<u>MW-1</u>				
06/06/90	105.31	6.65	98.66	None
08/16/90		7.00	98.31	None
08/21/90		7.05	98.26	None
09/07/90		7.24	98.07	None
11/20/90		7.46	97.85	None
11/29/90		7.40	97.91	None
12/19/90		6.99	98.32	None
01/29/91		7.23	98.08	None
02/27/91		7.45	97.86	None
03/07/91		6.96	98.35	None
03/26/91		6.02	99.29	None
05/02/91		7.04	98.27	None
06/27/91		6.71	98.60	None
07/24/91		6.91	98.40	None
08/22/91		6.85	98.46	None
09/30/91		7.04	98.27	None
10/17/91		7.22	98.09	None
11/21/91		7.17	98.14	None
12/18/91		7.46	97.85	None
01/19/92		7.44	97.87	None
02/20/92		6.25	99.06	None
03/20/92		6.40	98.91	None
04/20/92		6.88	98.43	None
05/19/92		7.10	98.21	None
06/08/92		7.22	98.09	None
07/15/92		7.92	97.39	None
08/06/92	106.10	7.29	98.81	None
10/29/92		7.34	98.76	None
11/23/92		8.15	97.95	None
<u>MW-2</u>				
06/06/90	105.78	9.00*	96.78*	0.92 Black Product
08/16/90		NM	NM	0.17 Black Product
08/21/90		NM	NM	0.17 Black Product
09/07/90		9.17*	96.61*	0.17 Black Product
11/20/90		9.20*	96.58*	Heavy Sheen
11/29/90		9.92*	95.86*	Heavy Sheen
12/19/90		8.95	96.83	None
01/29/91		9.01	96.77	Sheen
02/27/91		9.14	96.64	Sheen
03/07/91		8.94	96.84	Sheen
03/26/91		8.11	97.67	Sheen
05/02/91		8.72	97.06	None

See notes on page 4 of 4.

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 4494
Oakland, California
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<u>Well</u> Date	Elevation of Wellhead	Depth to Water	Water Elevation	Floating Product
<u>MW-2 (Cont.)</u>				
06/27/91		9.20	96.58	Sheen
07/24/91		9.25	96.53	None
08/22/91		9.20	96.58	None
09/30/91		9.31	96.47	Sheen
10/17/91		9.39	96.39	Sheen
11/21/91		9.20	96.58	None
12/18/91		9.23	96.55	Sheen
01/19/92		9.96**	95.82	Skimmer
02/20/92		9.13**	96.65	Skimmer
03/20/92	105.78	9.31**	96.47	Skimmer
04/20/92		9.69	96.09	Skimmer
05/15/92		9.92	95.86	Skimmer
06/08/92		9.84	95.94	Skimmer
07/15/92		10.19	95.59	Skimmer
08/06/92	106.57	10.05	96.52	Skimmer
10/29/92		10.00	96.57	Skimmer
11/23/92		9.87	96.70	0.01
<u>MW-3</u>				
08/16/90	105.51	8.87	96.64	None
08/21/90		8.85	96.66	None
09/07/90		8.98	96.53	None
11/20/90		9.10	96.41	None
11/29/90		9.05	96.46	None
12/19/90		8.67	96.84	None
01/29/91		8.96	96.55	None
02/27/91		8.71	96.80	None
03/07/91		8.49	97.02	None
03/26/91		7.65	97.86	None
05/02/91		8.62	96.89	None
06/27/91		8.94	96.57	None
07/24/91		8.96	96.55	None
08/22/91		8.92	96.59	None
09/30/91		9.04	96.47	None
10/17/91		9.12	96.39	None
11/21/91		8.92	96.59	None
12/18/91		8.97	96.54	None
01/19/92		8.69	96.82	None
02/20/92		7.78	97.73	None
03/20/92		8.15	97.36	None
04/20/92		8.57	96.94	None
05/15/92		8.76	96.75	None
06/08/92		8.74	96.77	None

See notes on page 4 of 4.

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TABLE 1
CUMULATIVE GROUNDWATER MONITORING DATA
ARCO Station 4494
Oakland, California
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Well Date	Elevation of Wellhead	Depth to Water	Water Elevation	Floating Product
<u>MW-3 (Cont.)</u>				
07/15/92		9.12	96.39	None
08/06/92	106.29	8.95	97.34	None
10/29/92		8.78	97.51	None
11/23/92		9.91	96.38	None
<u>MW-4</u>				
08/16/90	106.61	8.16	98.45	None
08/21/90		8.22	98.39	None
09/07/90		8.39	98.22	None
11/20/90		8.57	98.04	None
11/29/90		8.53	98.08	None
12/19/90		8.13	98.48	None
01/29/91		8.66	97.95	None
02/27/91		8.44	98.17	None
03/07/91		8.18	98.43	None
03/26/91		7.56	99.05	None
05/02/91		8.25	98.36	None
06/27/91		7.75	98.86	None
07/24/91	106.61	8.12	98.49	None
08/22/91		7.98	98.63	None
09/30/91		8.26	98.35	None
10/17/91		8.42	98.19	None
11/21/91		8.65	97.96	None
12/18/91		8.77	97.84	None
01/19/92		8.42	98.19	None
02/20/92		7.60	99.01	None
03/20/92		7.61	99.00	None
04/20/92		8.15	98.46	None
05/15/92		8.34	98.27	None
06/08/92		8.40	98.21	None
07/15/92		8.72	97.89	None
08/06/92	107.40	8.52	98.09	None
10/29/92		8.63	98.77	None
11/23/92		8.75	98.65	None
<u>MW-5</u>				
08/06/92	105.19	7.19	98.00	None
10/29/92		6.99	98.20	None
11/23/92		6.90	98.29	None
<u>MW-6</u>				
08/06/92	105.07	7.01	98.06	None
10/29/92		6.70	98.37	None

See notes on page 4 of 4.

Quarterly Groundwater Monitoring
ARCO Station 4494, Oakland, California

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TABLE 2
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF WATER SAMPLES--TPHg, TPHd, BTEX, and TOG
ARCO Station 4494
Oakland, California
(Page 2 of 2)

<u>Well</u> Date	TPHg (ppb)	TPHd (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl- benzene (ppb)	Total Xylenes (ppb)	TOG (ppm)
<u>MW-4 (Cont.)</u>							
09/07/90	NA	NA	NA	NA	NA	NA	<5,000
11/29/90	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
03/07/91	<50	NA	<0.30	<0.30	<0.30	<0.50	NA
06/27/91	<30	NA	0.75	1.1	<0.30	1.6	NA
09/30/91	<30	NA	<0.30	<0.30	<0.30	<0.30	NA
12/18/91	<30	NA	0.83	1.2	<0.30	0.58	NA
03/20/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
06/08/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
08/06/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
10/29/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
<u>MW-5</u>							
08/06/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
10/29/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
<u>MW-6</u>							
08/06/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
10/29/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
<u>MW-7</u>							
08/06/92	<50	NA	<0.50	<0.50	<0.50	<0.50	NA
10/29/92	<50	NA	<0.5	<0.5	<0.5	<0.5	NA
<u>Jan. 1990</u>							
MCLs	--	--	1.0	--	680	1,750	--
DWAL	--	--	--	100	--	--	--

TPHg : Total petroleum hydrocarbons as gasoline using EPA Methods 5030 and 8015.
 TPHd : Total petroleum hydrocarbons as diesel using EPA Methods 3550 and 8015.
 BTEX : Benzene, toluene, ethylbenzene, and total xylene isomers using EPA Method 5030 and 8020.
 TOG : Total oil and grease using EPA Standard Method 503E.
 NA : Not Analyzed.
 MCL : State Maximum Contaminant Level (October 1990).
 DWAL : State Drinking Water Action Level (October 1990).

Groundwater was not sampled during the First Quarter 1993, due to ongoing construction activities at the site.

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TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF WATER SAMPLES—BNAs, VOCs, and Metals
ARCO Station 4494
Oakland, California
(Page 1 of 2)

Well Date	BNAs (ppm)	VOCs (ppb)	Total Cadmium (ppm)	Chromium (ppm)	Lead (ppm)	Nickel (ppm)	Zinc (ppm)
<u>MW-1</u>							
06/19/90	<0.05	<0.05	0.024	<0.02	0.10	NA	0.049
08/16/90	NA	NA	NA	NA	NA	NA	NA
11/29/90	NA	NA	NA	NA	NA	NA	NA
03/07/91	NA	NA	NA	NA	NA	NA	NA
06/27/91	NA	NA	NA	NA	NA	NA	NA
09/30/91	NA	NA	NA	NA	NA	NA	NA
12/18/91	NA	NA	NA	NA	NA	NA	NA
03/20/92	NA	NA	NA	NA	NA	NA	NA
06/08/92	NA	NA	0.003	<0.005	<0.002	<0.02	0.018
08/06/92	NA	NA	NA	NA	NA	NA	NA
10/29/92	NA	NA	NA	NA	NA	NA	NA
<u>MW-2</u>							
06/08/92	NA	NA	0.214	0.402	0.658	0.434	252
08/06/92	NA	NA	0.005	0.018	0.088	0.041	4.7
10/29/92	NA	NA	NA	NA	NA	NA	NA
<u>MW-3</u>							
08/16/90	<0.05	<0.05	<0.01	0.06	0.07	NA	0.07
11/29/90	NA	NA	NA	NA	NA	NA	NA
03/07/91	NA	NA	NA	NA	NA	NA	NA
06/27/91	NA	NA	NA	NA	NA	NA	NA
09/30/91	NA	NA	NA	NA	NA	NA	NA
12/18/91	NA	NA	NA	NA	NA	NA	NA
03/20/92	NA	NA	NA	NA	NA	NA	NA
06/08/92	NA	NA	<0.003	0.012	0.016	<0.02	0.038
08/06/92	NA	NA	NA	NA	NA	NA	NA
10/29/92	NA	NA	NA	NA	NA	NA	NA
<u>MW-4</u>							
08/16/90	<0.05	<0.05	<0.01	<0.02	<0.02	NA	0.03
03/07/91	NA	NA	NA	NA	NA	NA	NA
11/29/90	NA	NA	NA	NA	NA	NA	NA
03/07/91	NA	NA	NA	NA	NA	NA	NA
06/27/91	NA	NA	NA	NA	NA	NA	NA
09/30/91	NA	NA	NA	NA	NA	NA	NA
12/18/91	NA	NA	NA	NA	NA	NA	NA
03/20/92	NA	NA	NA	NA	NA	NA	NA
06/08/92	NA	NA	<0.003	<0.005	<0.002	<0.02	0.013
08/06/92	NA	NA	NA	NA	NA	NA	NA
10/29/92	NA	NA	NA	NA	NA	NA	NA

See notes on page 2 of 2.

Quarterly Groundwater Monitoring
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TABLE 3
CUMULATIVE RESULTS OF LABORATORY ANALYSES OF WATER SAMPLES—BNAs, VOCs, and Metals
ARCO Station 4494
Oakland, California
(Page 2 of 2)

<u>Well</u> Date	BNAs (ppm)	VOCs (ppb)	Total Cadmium (ppm)	Chromium (ppm)	Lead (ppm)	Nickel (ppm)	Zinc (ppm)
<u>MW-5</u>							
08/06/92	NA	NA	NA	NA	NA	NA	NA
10/29/92	NA	NA	NA	NA	NA	NA	NA
<u>MW-6</u>							
08/06/92	NA	NA	NA	NA	NA	NA	NA
10/29/92	NA	NA	NA	NA	NA	NA	NA
<u>MW-7</u>							
08/06/92	NA	NA	NA	NA	NA	NA	NA
10/29/92	NA	NA	NA	NA	NA	NA	NA
DWALs/MCLs	---	---	0.010	0.05	0.05	NE	5.0

NA : Not Analyzed.
 BNA : Base neutral and acid extractables including polynuclear aromatics concentrations are below laboratory reporting limits for respectable compounds except as indicated. (^a = naphthalene, ^b = 2-methylnaphthalene)
 DWALs : Drinking Water Action Levels (California Department of Health Services, Office of Drinking Water, October 1990).
 MCLs : Maximum Contaminant Levels (California Department of Health Services, Office of Drinking Water, October 1990).
 NE : No established DWAL or MCL.

Groundwater was not sampled during the First Quarter 1993, due to ongoing construction activities at the site.

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TABLE 4
APPROXIMATE CUMULATIVE PRODUCT RECOVERED
ARCO Station 4494
Oakland, California

Date	Floating Product Removed (gallons)	Water Removed (gallons)
<u>MW-2</u>		
06/19/90	2	-
08/21/90	0.3	3.5
09/07/90	0.1	4
11/20/90	2	3
11/29/90	2	
01/29/91	Sheen	3.4
02/27/91	Sheen	7
03/07/91	Sheen	7
06/27/91	Sheen	7
09/30/91	Sheen	7
12/18/91	Sheen	7
01/30/92	None present	0
02/28/92	None present	0
03/25/92	None present	0
04/15/92	None Present	0
05/14/92	None Present	0
06/30/92	None Present	0
07/31/92	None Present	0
08/26/92	None Present	0
10/26/92	Sheen	0
11/23/92	None Present	0
12/08/92	Well MW-2 Destroyed	
Total:	6.41 Gallons	48.9 Gallons