EMCON
1921 Ringwood Avenue • San Jose, California 95131-1721 • (408) 453-7300 • Fax (408) 437-9526

95 JUN -6 AM 11:20

Date May 25, 1995
Project 0805-135.03

To: STID 3626

Ms. Susan Hugo
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harborbay Parkway, Suite 250
Alameda, California 94502-6577

We are enclosing:

Copies	Description
1	First quarter 1995 groundwater monitoring report for ARCO service station 6148, Oakland, California

For your:			Sent by:	
	X	Use		Regular Mail
		Approval		Standard Air
		Review		Courier
		Information	X	Other Certified Mail

Comments:
The enclosed groundwater monitoring report is being sent to you per the request of ARCO Products Company. Please call if you have questions or comments.

David Larsen
Project Coordinator

cc: Kevin Graves, RWQCB - SFBR
Michael Whelan, ARCO Products Company
David Larsen, EMCON
File

ARCO Products Company
Environmental Engineering
2155 South Bascom Avenue, Suite 202
Campbell, California 95008

Date: May 25, 1995

Re: ARCO Station # 6148 • 5131 Shattuck Avenue • Oakland, CA
First Quarter 1995 Groundwater Monitoring Report

" I declare, that to the best of my knowledge at the present time, that the information and/or recommendations contained in the attached proposal or report are true and correct."

Submitted by:

Michael R. Whelan

Michael R. Whelan
Environmental Engineer

EMCON
1921 Ringwood Avenue • San Jose, California 95131-1721 • (408) 453-7300 • Fax (408) 437-9526

May 17, 1995
Project 0805-135.03

Mr. Michael Whelan
ARCO Products Company
2155 South Bascom Avenue, Suite 202
Campbell, California 95008

Re: First quarter 1995 groundwater monitoring program results, ARCO service station 6148, Oakland, California

Dear Mr. Whelan:

This letter presents the results of the first quarter 1995 groundwater monitoring program at ARCO Products Company (ARCO) service station 6148, 5131 Shattuck Avenue, Oakland, California (Figure 1). The quarterly monitoring program complies with Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

BACKGROUND

On June 1, 1987, a waste-oil tank was removed from the site by Crosby and Overton and Erico Construction. In December 1991, as part of an initial subsurface environmental investigation, RESNA installed three groundwater monitoring wells (MW-1, MW-2, and MW-3). In October 1992, RESNA conducted a second phase of investigation, installing four additional groundwater monitoring wells, MW-4 through MW-7. Between April 1993 and July 1993, as part of a third phase of investigation, RESNA installed one air-sparge (AS) well (AS-1), one combination air-sparge/vapor extraction well (AS-2/VW-2), and two vadose wells (VW-1 and VW-3). Combination AS and soil-vapor extraction (SVE) pilot tests were performed at the site in February 1994.

Groundwater monitoring and sampling activities at this site were initiated in December 1991 and March 1992, respectively. There are currently seven groundwater monitoring wells, three vadose wells, and two AS wells on site (Figure 2). For additional background information, please refer to *Report of Findings, Air Sparge Pilot Test at ARCO Station 6148, 5131 Shattuck Avenue, Oakland, California* (RESNA, June 7, 1994).

EMCON is currently evaluating results of the AS and SVE tests to select an appropriate off-gas abatement system for SVE and AS remediation at this site.

Water levels are measured quarterly in wells MW-1 through MW-7. Well MW-7 is sampled semiannually during the first and third quarters. Wells MW-1 through MW-6 are sampled quarterly.

MONITORING PROGRAM FIELD PROCEDURES AND RESULTS

The first quarter 1995 groundwater monitoring event was performed by EMCON on March 20, 1995. Field work this quarter included (1) measuring depths to groundwater and subjectively analyzing groundwater for the presence of floating product in wells MW-1 through MW-7, (2) purging and subsequently sampling groundwater monitoring wells MW-1 through MW-7 for laboratory analysis, and (3) directing a state-certified laboratory to analyze the groundwater samples. Floating product entered well MW-2 during purging and the well was not sampled. Copies of all field data sheets from the first quarter 1995 groundwater monitoring event are included in Appendix A.

ANALYTICAL PROCEDURES

Groundwater samples collected during first quarter 1995 monitoring were analyzed for total petroleum hydrocarbons as gasoline (TPHG), and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Groundwater samples were prepared for analysis by U.S. Environmental Protection Agency (USEPA) method 5030 (purge and trap). Groundwater was analyzed for TPHG by the methods accepted by the Department of Toxic Substances Control, California Environmental Protection Agency (Cal-EPA), and referenced in the *Leaking Underground Fuel Tank* (LUFT) *Field Manual* (State Water Resources Control Board, October 1989). Samples were analyzed for BTEX by USEPA method 8020, as described in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (EPA SW-846, November 1986, third edition). Groundwater samples collected from well MW-3 were also analyzed for total recoverable petroleum hydrocarbons (TRPH) by USEPA method 418.1. These methods are recommended for samples from petroleum-hydrocarbon-impacted sites in the *Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites* (August 10, 1990).

MONITORING PROGRAM RESULTS

Results of the first quarter 1995 groundwater monitoring event are summarized in Table 1 and illustrated in Figure 2. Historical groundwater elevation data, including top-of-casing elevations, depth-to-water measurements, calculated groundwater elevations, floating-product thickness measurements, and groundwater flow direction and gradient data, are summarized in Table 2. Table 3 summarizes historical laboratory data for

TPHG, BTEX, and TRPH analyses. Table 4 summarizes historical laboratory data for volatile organic compound (VOC) and semivolatile organic compound (SVOC) analyses. Historical laboratory data for diesel and metals analyses are summarized in Table 5. Copies of the first quarter 1995 analytical results and chain-of-custody documentation are included in Appendix B.

MONITORING PROGRAM EVALUATION

Groundwater elevation data collected on March 20, 1995, illustrate that groundwater beneath the site flows southwest at an approximate hydraulic gradient of 0.02 foot per foot. Figure 2 illustrates groundwater contours and analytical data for the first quarter of 1995.

Groundwater samples collected from wells MW-6 and MW-7 did not contain detectable concentrations of TPHG or BTEX. Groundwater samples collected from wells MW-1, MW-3, MW-4, and MW-5 contained concentrations of TPHG from 88 to 29,000 micrograms per liter (µg/L) and concentrations of benzene from 1 to 6,900 µg/L. Groundwater samples collected from well MW-3 contained 16 milligrams per liter (mg/L) TRPH. Because floating product entered well MW-2 during purging, the well was not sampled.

LIMITATIONS

No monitoring event is thorough enough to describe all geologic and hydrogeologic conditions of interest at a given site. If conditions have not been identified during the monitoring event, such a finding should not therefore be construed as a guarantee of the absence of such conditions at the site, but rather as the result of the scope, limitations, and cost of work performed during the monitoring event.

SITE STATUS UPDATE

This update reports site activities performed during the first quarter of 1995 and the anticipated site activities for the second quarter of 1995.

First Quarter 1995 Activities

- Prepared and submitted quarterly groundwater monitoring report for fourth quarter 1994.

- Performed quarterly groundwater monitoring for first quarter 1995. Based on eight consecutive quarters of nondetectable TPHG and BTEX analytical results for well MW-7, ARCO began sampling well MW-7 semiannually (first and third quarters). Wells MW-1 through MW-6 will be sampled quarterly. Water levels in all wells will be measured quarterly.

- Initiated design and permitting of the interim SVE and air sparge remediation systems.

- Discontinued volatile organic compound (VOC) analysis for wells MW-1 through MW-7, and semivolatile organic compound (SVOC) analysis for well MW-3. Additional analyses were discontinued because ARCO believes these compounds are coming from an upgradient source.

Work Anticipated for Second Quarter 1995

- Prepare and submit quarterly groundwater monitoring report for first quarter 1995.

- Perform quarterly groundwater monitoring for second quarter 1995.

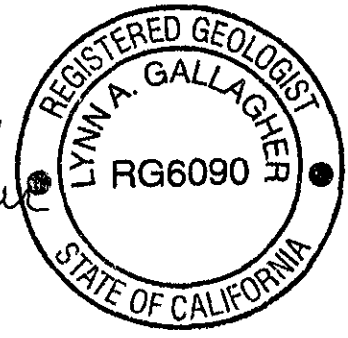
Please call if you have questions.

Sincerely,

EMCON

David Larsen
Project Coordinator

Lynn A. Gallagher, R.G. 6090
Project Geologist



Attachments:

Table 1 -	Groundwater Monitoring Data, First Quarter 1995
Table 2 -	Historical Groundwater Elevation Data
Table 3 -	Historical Groundwater Analytical Data (TPHG, BTEX, and TRPH)
Table 4 -	Historical Groundwater Analytical Data (VOCs and SVOCs)
Table 5 -	Historical Groundwater Analytical Data (Diesel and Metals)
Figure 1 -	Site Location
Figure 2 -	Groundwater Data, First Quarter 1995
Appendix A -	Field Data Sheets, First Quarter 1995 Groundwater Monitoring Event
Appendix B -	Analytical Results and Chain-of-Custody Documentation, Fourth Quarter 1994

cc: Susan Hugo, ACHCSA
Kevin Graves, RWQCB - SFBR

Table 1
Groundwater Monitoring Data
First Quarter 1995
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 05-04-95
Project Number: 0805-135.03

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot	Water Sample Field Date	TPHG µg/l	Benzene µg/l	Toluene µg/l	Ethyl-benzene µg/l	Total Xylenes µg/l	TOG or TRPH mg/l
MW-1	03-20-95	108.03	15.75	92.28	ND	SW	0.02	03-20-95	830	140	5	41	110	NA
MW-2	03-20-95	107.43	15.50	91.93	ND*	SW	0.02	03-20-95	Not sampled: floating product entered well during purging					NA
MW-3	03-20-95	107.77	15.60	92.17	ND	SW	0.02	03-20-95	29000	880	190	760	2000	16
MW-4	03-20-95	106.58	13.85	92.73	ND	SW	0.02	03-20-95	88	1	<0.5	<0.5	0.7	NA
MW-5	03-20-95	106.68	14.92	91.76	ND	SW	0.02	03-20-95	21000	6900	450	800	1300	NA
MW-6	03-20-95	105.16	12.13	93.03	ND	SW	0.02	03-20-95	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	03-20-95	107.08	12.32	94.76	ND	SW	0.02	03-20-95	<50	<0.5	<0.5	<0.5	<0.5	NA

TOC = Top of casing
ft-MSL = Elevation in feet, relative to mean sea level
MWN = Ground-water flow direction and gradient apply to the entire monitoring well network
TPHG = Total petroleum hydrocarbons as gasoline
TOG = Total oil and grease measured by EPA Method 5520 C&F
TRPH = Total recoverable petroleum hydrocarbons measured by EPA Method 418.1
µg/l = Micrograms per liter
mg/l = Milligrams per liter
ND = None detected
SW = Southwest
NA = Not analyzed
* = Floating product entered the well during purging

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Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 05-04-95
Project Number: 0805-135.03

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-1	12-23-91	108.03	18.26	89.77	Sheen	NR	NR
MW-1	01-07-92	108.03	17.44	90.59	Sheen	NR	NR
MW-1	01-19-92	108.03	17.17	90.86	ND	NR	NR
MW-1	02-19-92	108.03	16.52	91.51	ND	NR	NR
MW-1	03-18-92	108.03	16.81	91.22	ND	NR	NR
MW-1	04-20-92	108.03	17.56	90.47	ND	NR	NR
MW-1	05-15-92	108.03	17.96	90.07	ND	NR	NR
MW-1	06-12-92	108.03	18.16	89.87	ND	NR	NR
MW-1	07-15-92	108.03	18.32	89.71	ND	NR	NR
MW-1	08-07-92	108.03	18.34	89.69	ND	NR	NR
MW-1	09-14-92	108.03	18.46	89.57	ND	NR	NR
MW-1	10-07-92	108.03	18.52	89.51	ND	NR	NR
MW-1	11-12-92	108.03	18.11	89.92	ND	NR	NR
MW-1	12-09-92	108.03	17.10	90.93	ND	NR	NR
MW-1	01-21-93	108.03	15.44	92.59	ND	NR	NR
MW-1	02-22-93	108.03	16.54	91.49	ND	NR	NR
MW-1	03-25-93	108.03	17.05	90.98	ND	NR	NR
MW-1	04-14-93	108.03	17.45	90.58	ND	NR	NR
MW-1	05-22-93	108.03	17.78	90.25	ND	NR	NR
MW-1	06-17-93	108.03	17.90	90.13	ND	NR	NR
MW-1	07-27-93	108.03	18.10	89.93	ND	NR	NR
MW-1	08-29-93	108.03	18.31	89.72	ND	NR	NR
MW-1	09-30-93	108.03	18.24	89.79	ND	NR	NR
MW-1	11-16-93	108.03	18.17	89.86	ND	NR	NR
MW-1	02-02-94	108.03	17.31	90.72	ND	NR	NR
MW-1	04-29-94	108.03	17.31	90.72	ND	NR	NR
MW-1	08-02-94	108.03	17.95	90.08	ND	SW	0.017
MW-1	11-16-94	108.03	17.04	90.99	ND	SW	0.02
MW-1	03-20-95	108.03	15.75	92.28	ND	SW	0.02

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 05-04-95
Project Number: 0805-135.03

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-2	12-23-91	107.43	17.98	89.45	Sheen	NR	NR
MW-2	01-07-92	107.43	17.15	90.28	Sheen	NR	NR
MW-2	01-19-92	107.43	17.47	89.96	ND	NR	NR
MW-2	02-19-92	107.43	16.28	91.15	ND	NR	NR
MW-2	03-18-92	107.43	16.52	90.91	ND	NR	NR
MW-2	04-20-92	107.43	17.27	90.16	ND	NR	NR
MW-2	05-15-92	107.43	17.62	89.81	ND	NR	NR
MW-2	06-12-92	107.43	^17.63	^89.80	0.05	NR	NR
MW-2	07-15-92	107.43	17.65	89.78	ND	NR	NR
MW-2	08-07-92	107.43	17.80	89.63	ND	NR	NR
MW-2	09-14-92	107.43	^18.09	^89.34	0.55	NR	NR
MW-2	10-07-92	107.43	^18.55	^88.88	0.31	NR	NR
MW-2	11-12-92	107.43	17.95	89.48	Sheen	NR	NR
MW-2	12-09-92	107.43	^16.85	^90.58	0.02	NR	NR
MW-2	01-21-93	107.43	^15.08	^92.35	0.01	NR	NR
MW-2	02-22-93	107.43	^16.20	^91.23	0.01	NR	NR
MW-2	03-25-93	107.43	^16.72	^90.71	0.01	NR	NR
MW-2	04-14-93	107.43	^17.15	^90.28	ND	NR	NR
MW-2	05-22-93	107.43	^17.44	^89.99	ND	NR	NR
MW-2	06-17-93	107.43	17.57	89.86	ND	NR	NR
MW-2	07-27-93	107.43	^17.71	^89.72	ND	NR	NR
MW-2	08-29-93	107.43	^18.20	^89.23	ND	NR	NR
MW-2	09-30-93	107.43	^18.14	^89.29	ND	NR	NR
MW-2	11-16-93	107.43	^17.85	^89.58	ND	NR	NR
MW-2	02-02-94	107.43	16.96	90.47	ND	NR	NR
MW-2	04-29-94	107.43	16.95	90.48	ND	NR	NR
MW-2	08-02-94	107.43	17.59	89.84	ND	SW	0.017
MW-2	11-16-94	107.43	16.73	90.70	ND	SW	0.02
MW-2	03-20-95	107.43	15.50	91.93	ND*	SW	0.02

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 05-04-95
Project Number: 0805-135.03

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-3	12-23-91	107.77	18.14	89.63	Sheen	NR	NR
MW-3	01-07-92	107.77	17.26	90.51	Sheen	NR	NR
MW-3	01-19-92	107.77	17.63	90.14	ND	NR	NR
MW-3	02-19-92	107.77	16.34	91.43	ND	NR	NR
MW-3	03-18-92	107.77	16.62	91.15	ND	NR	NR
MW-3	04-20-92	107.77	17.38	90.39	ND	NR	NR
MW-3	05-15-92	107.77	17.80	89.97	ND	NR	NR
MW-3	06-12-92	107.77	18.01	89.76	ND	NR	NR
MW-3	07-15-92	107.77	18.17	89.60	ND	NR	NR
MW-3	08-07-92	107.77	18.23	89.54	ND	NR	NR
MW-3	09-14-92	107.77	18.36	89.41	ND	NR	NR
MW-3	10-07-92	107.77	18.90	88.87	Sheen	NR	NR
MW-3	11-12-92	107.77	18.00	89.77	Sheen	NR	NR
MW-3	12-09-92	107.77	16.85	90.92	Droplets	NR	NR
MW-3	01-21-93	107.77	15.24	92.53	ND	NR	NR
MW-3	02-22-93	107.77	16.36	91.41	ND	NR	NR
MW-3	03-25-93	107.77	16.89	90.88	ND	NR	NR
MW-3	04-14-93	107.77	17.29	90.48	ND	NR	NR
MW-3	05-22-93	107.77	17.64	90.13	ND	NR	NR
MW-3	06-17-93	107.77	17.75	90.02	ND	NR	NR
MW-3	07-27-93	107.77	17.98	89.79	ND	NR	NR
MW-3	08-29-93	107.77	18.14	89.63	ND	NR	NR
MW-3	09-30-93	107.77	18.14	89.63	ND	NR	NR
MW-3	11-16-93	107.77	18.30	89.47	ND	NR	NR
MW-3	02-02-94	107.77	17.16	90.61	ND	NR	NR
MW-3	04-29-94	107.77	17.14	90.63	ND	NR	NR
MW-3	08-02-94	107.77	17.81	89.96	ND	SW	0.017
MW-3	11-16-94	107.77	16.91	90.86	ND	SW	0.02
MW-3	03-20-95	107.77	15.60	92.17	ND	SW	0.02

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 05-04-95
Project Number: 0805-135.03

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-4	11-12-92	106.58	16.08	90.50	ND	NR	NR
MW-4	12-09-92	106.58	15.00	91.58	ND	NR	NR
MW-4	01-21-93	106.58	13.35	93.23	ND	NR	NR
MW-4	02-22-93	106.58	14.48	92.10	ND	NR	NR
MW-4	03-25-93	106.58	15.06	91.52	ND	NR	NR
MW-4	04-14-93	106.58	15.50	91.08	ND	NR	NR
MW-4	05-22-93	106.58	15.79	90.79	ND	NR	NR
MW-4	06-17-93	106.58	14.90	91.68	ND	NR	NR
MW-4	07-27-93	106.58	16.11	90.47	ND	NR	NR
MW-4	08-29-93	106.58	16.21	90.37	ND	NR	NR
MW-4	09-30-93	106.58	16.23	90.35	ND	NR	NR
MW-4	11-16-93	106.58	16.30	90.28	ND	NR	NR
MW-4	02-02-94	106.58	15.36	91.22	ND	NR	NR
MW-4	04-29-94	106.58	15.36	91.22	ND	NR	NR
MW-4	08-02-94	106.58	15.94	90.64	ND	SW	0.017
MW-4	11-16-94	106.58	14.99	91.59	ND	SW	0.02
MW-4	03-20-95	106.58	13.85	92.73	ND	SW	0.02
MW-5	11-12-92	106.68	16.81	89.87	ND	NR	NR
MW-5	12-09-92	106.68	16.40	90.28	ND	NR	NR
MW-5	01-21-93	106.68	14.58	92.10	ND	NR	NR
MW-5	02-22-93	106.68	15.65	91.03	ND	NR	NR
MW-5	03-25-93	106.68	16.07	90.61	ND	NR	NR
MW-5	04-14-93	106.68	16.34	90.34	ND	NR	NR
MW-5	05-22-93	106.68	16.56	90.12	ND	NR	NR
MW-5	06-17-93	106.68	Not surveyed:				
MW-5	07-27-93	106.68	16.80	89.88	ND	NR	NR
MW-5	08-29-93	106.68	16.93	89.75	ND	NR	NR
MW-5	09-30-93	106.68	16.97	89.71	ND	NR	NR
MW-5	11-16-93	106.68	17.03	89.65	ND	NR	NR
MW-5	02-02-94	106.68	16.38	90.30	ND	NR	NR
MW-5	04-29-94	106.68	16.41	90.27	ND	NR	NR
MW-5	08-02-94	106.68	16.81	89.87	ND	SW	0.017
MW-5	11-16-94	106.68	16.12	90.56	ND	SW	0.02
MW-5	03-20-95	106.68	14.92	91.76	ND	SW	0.02

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 05-04-95
Project Number: 0805-135.03

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-6	11-12-92	105.16	14.05	91.11	ND	NR	NR
MW-6	12-09-92	105.16	13.37	91.79	ND	NR	NR
MW-6	01-21-93	105.16	11.76	93.40	ND	NR	NR
MW-6	02-22-93	105.16	12.62	92.54	ND	NR	NR
MW-6	03-25-93	105.16	13.04	92.12	ND	NR	NR
MW-6	04-14-93	105.16	13.47	91.69	ND	NR	NR
MW-6	05-22-93	105.16	13.80	91.36	ND	NR	NR
MW-6	06-17-93	105.16	13.88	91.28	ND	NR	NR
MW-6	07-27-93	105.16	14.13	91.03	ND	NR	NR
MW-6	08-29-93	105.16	14.19	90.97	ND	NR	NR
MW-6	09-30-93	105.16	14.34	90.82	ND	NR	NR
MW-6	11-16-93	105.16	14.41	90.75	ND	NR	NR
MW-6	02-02-94	105.16	13.60	91.56	ND	NR	NR
MW-6	04-29-94	105.16	13.66	91.50	ND	NR	NR
MW-6	08-02-94	105.16	13.99	91.17	ND	SW	0.017
MW-6	11-16-94	105.16	13.11	92.05	ND	SW	0.02
MW-6	03-20-95	105.16	12.13	93.03	ND	SW	0.02
MW-7	11-12-92	107.08	14.75	92.33	ND	NR	NR
MW-7	12-09-92	107.08	12.55	94.53	ND	NR	NR
MW-7	01-21-93	107.08	11.52	95.56	ND	NR	NR
MW-7	02-22-93	107.08	12.82	94.26	ND	NR	NR
MW-7	03-25-93	107.08	13.43	93.65	ND	NR	NR
MW-7	04-14-93	107.08	13.98	93.10	ND	NR	NR
MW-7	05-22-93	107.08	14.41	92.67	ND	NR	NR
MW-7	06-17-93	107.08	14.50	92.58	ND	NR	NR
MW-7	07-27-93	107.08	14.82	92.26	ND	NR	NR
MW-7	08-29-93	107.08	15.05	92.03	ND	NR	NR
MW-7	09-30-93	107.08	15.04	92.04	ND	NR	NR
MW-7	11-16-93	107.08	15.12	91.96	ND	NR	NR
MW-7	02-02-94	107.08	14.04	93.04	ND	NR	NR
MW-7	04-29-94	107.08	14.10	92.98	ND	NR	NR
MW-7	08-02-94	107.08	14.61	92.47	ND	SW	0.017
MW-7	11-16-94	107.08	13.37	93.71	ND	SW	0.02
MW-7	03-20-95	107.08	12.32	94.76	ND	SW	0.02

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 05-04-95
Project Number: 0805-135.03

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
AS-2	09-30-93	NR	18.31	NR	ND	NR	NR

TOC = Top of casing
ft-MSL = Elevation in feet, relative to mean sea level
MWN = Ground-water flow direction and gradient apply to the entire monitoring well network
NR = Not reported; data not available
ND = None detected
SW = Southwest
^ = Groundwater elevation (GWE) and depth to water (DTW) adjusted to include 80 percent of the floating product thickness (FPT):
[GWE = (TOC - DTW) + (FPT x 0.8)]
* = Floating product entered the well during purging

Table 3
Historical Groundwater Analytical Data
(TPHG, BTEX, and TRPH)

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 05-04-95
Project Number: 0805-135.03

Well Designation	Water Sample Field Date	TPHG µg/l	Benzene µg/l	Toluene µg/l	Ethyl-benzene µg/l	Total Xylenes µg/l	TOG or TRPH mg/l
MW-1	03-18-92	790	310	26	12	44	<0.5 (1.4)
MW-1	06-12-92	1000	290	15	10	30	<0.5
MW-1	09-14-92	1000	370	6.5	6.5	17	0.9
MW-1	10-07-92	590	200	19	6.7	19	<0.5
MW-1	01-22-93	1200	370	57	18	39	NA
MW-1	04-14-93	140	46	<2.5	<2.5	<2.5	NA
MW-1	09-30-93	220	64	0.9	2.2	4	NA
MW-1	11-16-93	180	53	0.7	1.7	4.1	NA
MW-1	02-02-94	250	93	<0.5	1.9	1	NA
MW-1	04-29-94	350	99	1.3	3.9	11	NA
MW-1	08-02-94	210	82	<1	<1	2.5	NA
MW-1	11-16-94	650	260	38	6.1	15	NA
MW-1	03-20-95	830	140	5	41	110	NA
MW-2	03-18-92	8400	1400	1000	220	870	1.2 (3.0)
MW-2	06-12-92	Not sampled: well contained floating product					
MW-2	09-14-92	Not sampled: well contained floating product					
MW-2	10-07-92	Not sampled: well contained floating product					
MW-2	01-22-93	Not sampled: well contained floating product					
MW-2	04-14-93	Not sampled: well contained floating product					
MW-2	09-30-93	Not sampled: well contained floating product					
MW-2	11-16-93	Not sampled: well contained floating product					
MW-2	02-02-94	16000	1300	2500	540	2700	NA
MW-2	04-29-94	11000	1400	1200	360	1400	NA
MW-2	08-02-94	4900	800	290	120	620	NA
MW-2	11-16-94	49000	3300	8300	1400	7200	NA
MW-2	03-20-95	Not sampled: floating product entered well during purging					NA

Table 3
Historical Groundwater Analytical Data
(TPHG, BTEX, and TRPH)

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 05-04-95
Project Number: 0805-135.03

Well Designation	Water Sample Field Date	TPHG µg/l	Benzene µg/l	Toluene µg/l	Ethyl-benzene µg/l	Total Xylenes µg/l	TOG or TRPH mg/l
MW-3	03-18-92	20000	3200	560	380	1000	7.8 (8.1)
MW-3	06-12-92	46000	3400	4200	1300	5400	16
MW-3	09-14-92	53000	4300	5700	1300	7300	5.5
MW-3	10-07-92	Not sampled: well contained floating product					
MW-3	01-22-93	35000	2100	1400	1200	4400	31
MW-3	04-14-93	13000	1800	390	990	3500	26
MW-3	09-30-93	79000	2400	3400	1900	8100	23
MW-3	11-16-93	72000	1400	2100	1900	8300	38
MW-3	02-02-94	26000	1400	1200	1200	4400	7.7 (7.8)
MW-3	04-29-94	22000	1400	620	910	3400	10
MW-3	08-02-94	17000	530	410	720	2600	6.6
MW-3	11-16-94	18000	1400	560	790	2800	2.3
MW-3	03-20-95	29000	880	190	760	2000	16
MW-4	11-12-92	77	32	<0.5	<0.5	<0.5	NA
MW-4	01-22-93	170	66	0.8	<0.5	1.5	NA
MW-4	04-14-93	<50	4.6	<0.5	<0.5	<0.5	NA
MW-4	09-30-93	52	13	<0.5	<0.5	<0.5	NA
MW-4	11-16-93	230	34	<0.5	<0.5	<0.5	NA
MW-4	02-02-94	<50	3.9	<0.5	<0.5	<0.5	NA
MW-4	04-29-94	<50	4.2	<0.5	<0.5	<0.5	NA
MW-4	08-02-94	<50	3.8	<0.5	<0.5	<0.5	NA
MW-4	11-16-94	110	31	<0.5	<0.5	<0.5	NA
MW-4	03-20-95	88	1	<0.5	<0.5	0.7	NA
MW-5	11-12-92	2900	1300	12	67	18	NA
MW-5	01-22-93	17000	5000	780	260	330	NA
MW-5	04-14-93	12000	4600	<50	180	130	NA
MW-5	09-30-93	4500	1100	<10	39	16	NA
MW-5	11-16-93	3300	700	<10	22	<10	NA
MW-5	02-02-94	10000	3000	65	240	78	NA
MW-5	04-29-94	7600	2400	27	130	44	NA
MW-5	08-02-94	1900	680	<10	24	<10	NA
MW-5	11-16-94	17000	5900	700	440	320	NA
MW-5	03-20-95	21000	6900	450	800	1300	NA

Table 3
Historical Groundwater Analytical Data
(TPHG, BTEX, and TRPH)

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 05-04-95
Project Number: 0805-135.03

Well Designation	Water Sample Field Date	TPHG µg/l	Benzene µg/l	Toluene µg/l	Ethyl-benzene µg/l	Total Xylenes µg/l	TOG or TRPH mg/l
MW-6	11-12-92	51	2.6	<0.5	<0.5	<0.5	NA
MW-6	01-22-93	<50	1.2	<0.5	<0.5	<0.5	NA
MW-6	04-14-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-6	09-30-93	74	2	<0.5	<0.5	<0.5	NA
MW-6	11-16-93	72	2.6	<0.5	<0.5	<0.5	NA
MW-6	02-02-94	61	2.2	<0.5	<0.5	<0.5	NA
MW-6	04-29-94	<50	0.6	<0.5	<0.5	<0.5	NA
MW-6	08-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-6	11-16-94	<50	1.1	<0.5	<0.5	<0.5	NA
MW-6	03-20-95	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	11-12-92	<50	1.8	<0.5	<0.5	<0.5	NA
MW-7	01-22-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	04-14-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	09-30-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	11-16-93	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	02-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	04-29-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	08-02-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	11-16-94	<50	<0.5	<0.5	<0.5	<0.5	NA
MW-7	03-20-95	<50	<0.5	<0.5	<0.5	<0.5	NA
AS-2	09-30-93	<50	1.2	<0.5	<0.5	<0.5	NA

TPHG = Total petroleum hydrocarbons as gasoline
TOG = Total oil and grease measured by EPA Method 5520 C&F
TRPH = Total recoverable petroleum hydrocarbons measured by EPA Method 418.1
µg/l = Micrograms per liter
mg/l = Milligrams per liter
NA = Not analyzed

Table 4
Historical Groundwater Analytical Data
(VOCs and SVOCs)

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 05-04-95
Project Number: 0805-135.03

Well Desig-nation	Water Sample Field Date	Halogenated Volatile Organic Compounds (VOCs) by EPA Method 5030/601						Semi-Volatile Organic Compounds (SVOCs) by EPA Method 3510/8270			
		PCE µg/l	TCE µg/l	Chloro-form µg/l	cis-1,2-DCE µg/l	Vinyl Chloride µg/l	1,1-DCA µg/l	Naphthalene µg/l	2-Methyl-naphthalene µg/l	Bis(2-ethylhexyl) Phthalate µg/l	Di-n-octyl Phthalate µg/l
MW-1	03-18-92	13	1.2	ND	ND	ND	ND	NA	NA	NA	NA
MW-1	06-12-92	18	1.4	ND	ND	ND	ND	NA	NA	NA	NA
MW-1	09-14-92	15	1.5	ND	ND	ND	ND	NA	NA	NA	NA
MW-1	10-07-92	23	1.5	0.6	ND	ND	ND	NA	NA	NA	NA
MW-1	01-22-93	11	0.9	ND	ND	ND	ND	ND	ND	ND	ND
MW-1	04-14-93	21	1.8	0.6	ND	ND	ND	NA	NA	NA	NA
MW-1	09-30-93	19	1.1	0.7	ND	ND	ND	NA	NA	NA	NA
MW-1	11-16-93	22	0.9	ND	ND	ND	ND	NA	NA	NA	NA
MW-1	02-02-94	11	1.1	ND	ND	ND	ND	NA	NA	NA	NA
MW-1	04-29-94	13	1.3	0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA
MW-1	08-02-94	15	1.4	0.7	0.7	<0.5	<0.5	NA	NA	NA	NA
MW-1	11-16-94	12	1.1	0.5	1.2	<0.5	<0.5	NA	NA	NA	NA
MW-1	03-20-95	Not analyzed: sampling for additional parameters was discontinued									
MW-2	03-18-92	19	2.22	ND	0.5	ND	ND	NA	NA	NA	NA
MW-2	06-12-92	Not sampled: well contained floating product									
MW-2	09-14-92	Not sampled: well contained floating product									
MW-2	10-07-92	Not sampled: well contained floating product									
MW-2	01-22-93	Not sampled: well contained floating product									
MW-2	04-14-93	Not sampled: well contained floating product									
MW-2	09-30-93	Not sampled: well contained floating product									
MW-2	11-16-93	Not sampled: well contained floating product									
MW-2	02-02-94	13	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-2	04-29-94	9.4	1.9	<0.5	2.2	<0.5	<0.5	NA	NA	NA	NA
MW-2	08-02-94	15	2	<0.5	2.9	<0.5	<0.5	NA	NA	NA	NA
MW-2	11-16-94	9.6	1.8	<0.5	2.1	<0.5	<0.5	NA	NA	NA	NA
MW-2	03-20-95	Not analyzed: sampling for additional parameters was discontinued									

Table 4
Historical Groundwater Analytical Data
(VOCs and SVOCs)

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 05-04-95
Project Number: 0805-135.03

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds (VOCs) by EPA Method 5030/601						Semi-Volatile Organic Compounds (SVOCs) by EPA Method 3510/8270			
		PCE	TCE	Chloroform	cis-1,2-DCE	Vinyl Chloride	1,1-DCA	Naphthalene	2-Methylnaphthalene	Bis(2-ethylhexyl) Phthalate	Di-n-octyl Phthalate
		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
MW-3	03-18-92	2.7	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-3	06-12-92	1.9	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-3	09-14-92	2	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-3	10-07-92	Not sampled: well contained floating product									
MW-3	01-22-93	1.9	ND	ND	ND	ND	ND	440	350	280	13
MW-3	04-14-93	1.7	ND	ND	ND	ND	ND	130	100	250	14
MW-3	09-30-93	1.2	ND	ND	ND	ND	ND	480	320	ND	ND
MW-3	11-16-93	1.5	ND	ND	ND	ND	ND	590	640	ND	ND
MW-3	02-02-94	ND*	ND*	ND*	ND*	ND*	ND*	160	91	9	ND
MW-3	04-29-94	1.7	<0.5	<0.5	<0.5	<0.5	<0.5	110	50	<10	<10
MW-3	08-02-94	1	<0.5	<0.5	<0.5	<0.5	<0.5	120	53	10	<10
MW-3	11-16-94	1.3	<0.5	<0.5	<0.5	<0.5	<0.5	100	53	<10	<10
MW-3	03-20-95	Not analyzed: sampling for additional parameters was discontinued									
MW-4	11-12-92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-4	01-22-93	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-4	04-14-93	1.1	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-4	09-30-93	1.6	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-4	11-16-93	1.9	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-4	02-02-94	1.4	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-4	04-29-94	1.9	<0.5	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA
MW-4	08-02-94	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA
MW-4	11-16-94	1.8	<0.5	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA
MW-4	03-20-95	Not analyzed: sampling for additional parameters was discontinued									

Table 4
Historical Groundwater Analytical Data
(VOCs and SVOCs)

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 05-04-95
Project Number: 0805-135.03

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds (VOCs) by EPA Method 5030/601						Semi-Volatile Organic Compounds (SVOCs) by EPA Method 3510/8270			
		PCE	TCE	Chloroform	cis-1,2-DCE	Vinyl Chloride	1,1-DCA	Naphthalene	2-Methylnaphthalene	Bis(2-ethylhexyl) Phthalate	Di-n-octyl Phthalate
		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
MW-5	11-12-92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-5	01-22-93	11	4.7	ND	1.8	ND	ND	ND	ND	ND	ND
MW-5	04-14-93	7.9	2	ND	1.5	0.9	ND	NA	NA	NA	NA
MW-5	09-30-93	17	2.8	ND	2.9	0.8	ND	NA	NA	NA	NA
MW-5	11-16-93	19	5.1	ND	4	ND	ND	NA	NA	NA	NA
MW-5	02-02-94	2.7	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-5	04-29-94	10	2.7	<0.5	2.4	<0.5	<0.5	NA	NA	NA	NA
MW-5	08-02-94	13	5.4	<0.5	5.7	<0.5	<0.5	NA	NA	NA	NA
MW-5	11-16-94	1.1	1	<0.5	3.5	1.3	<0.5	NA	NA	NA	NA
MW-5	03-20-95	Not analyzed: sampling for additional parameters was discontinued									
MW-6	11-12-92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-6	01-22-93	120	6.2	6.6	1.8	ND	ND	NA	NA	NA	NA
MW-6	04-14-93	120	5.8	ND	1.1	ND	6.3	NA	NA	NA	NA
MW-6	09-30-93	220	5.2	ND	2.7	ND	ND	NA	NA	NA	NA
MW-6	11-16-93	160	8.5	15	3.2	ND	ND	NA	NA	NA	NA
MW-6	02-02-94	100	ND	6.7	ND	ND	ND	NA	NA	NA	NA
MW-6	04-29-94	95	6.6	7.2	<2.5	<2.5	<2.5	NA	NA	NA	NA
MW-6	08-02-94	87	6.1	4.6	<2.5	<2.5	<2.5	NA	NA	NA	NA
MW-6	11-16-94	86	6.8	8.9	<2.5	<2.5	<2.5	NA	NA	NA	NA
MW-6	03-20-95	Not analyzed: sampling for additional parameters was discontinued									

Table 4
Historical Groundwater Analytical Data
(VOCs and SVOCs)

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 05-04-95
Project Number: 0805-135.03

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds (VOCs) by EPA Method 5030/601						Semi-Volatile Organic Compounds (SVOCs) by EPA Method 3510/8270			
		PCE	TCE	Chloroform	cis-1,2-DCE	Vinyl Chloride	1,1-DCA	Naphthalene	2-Methylnaphthalene	Bis(2-ethylhexyl) Phthalate	Di-n-octyl Phthalate
		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
MW-7	11-12-92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-7	01-22-93	6.8	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-7	04-14-93	4.3	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-7	09-30-93	2.5	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-7	11-16-93	4	ND	ND	ND	ND	ND	NA	NA	NA	NA
MW-7	02-02-94	3.4	ND	0.8	ND	ND	ND	NA	NA	NA	NA
MW-7	04-29-94	3.4	<0.5	1.1	<0.5	<0.5	<0.5	NA	NA	NA	NA
MW-7	08-02-94	3.3	<0.5	0.8	<0.5	<0.5	<0.5	NA	NA	NA	NA
MW-7	11-16-94	3.3	<0.5	<0.5	<0.5	<0.5	<0.5	NA	NA	NA	NA
MW-7	03-20-95	Not analyzed: sampling for additional parameters was discontinued									
AS-2	09-30-93	29	1.5	1	ND	ND	ND	NA	NA	NA	NA

PCE = Tetrachloroethene
TCE = Trichloroethene
cis-1,2-DCE = cis-1,2-Dichloroethene
1,1-DCA = 1,1-Dichloroethane
µg/l = Micrograms per liter
ND = Not detected
* = Sample was analyzed for volatile organic compounds using EPA Method 624 (only BTEX was detected)

Table 5
Historical Groundwater Analytical Data
(Diesel and Metals)

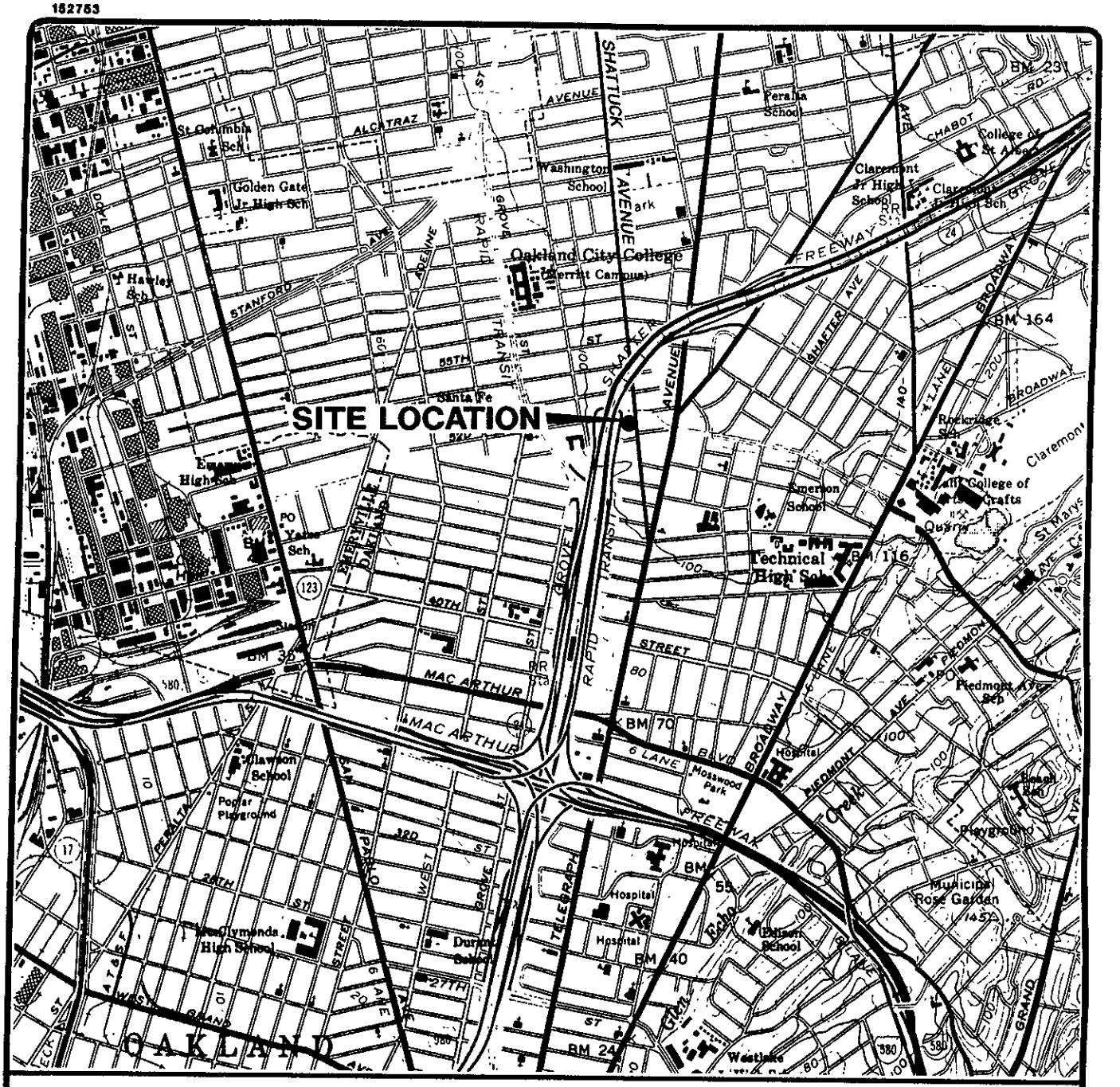
ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 05-04-95
Project Number: 0805-135.03

Well Designation	Water Sample Field Date	TPHD	Cadmium by EPA 6010	Chromium by EPA 6010	Lead by EPA 7421	Zinc by EPA 6010	Nickel by EPA 6010
		µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
MW-1	03-18-92	<50	<3	5	3	31	<20
MW-1	06-12-92	<50	NA	NA	NA	NA	NA
MW-1	09-14-92	<80	NA	NA	NA	NA	NA
MW-1	10-07-92	<50	NA	NA	NA	NA	NA
MW-1	01-22-93	NA	NA	NA	NA	NA	NA
MW-1	04-14-93	NA	<3	<5	3	25	<20
MW-1	09-30-93	Not analyzed: sampling for additional parameters was discontinued					
MW-2	03-18-92	230*	<3	21	9	54	38
MW-2	06-12-92	Not analyzed: sampling for additional parameters was discontinued					
MW-3	03-18-92	2800*	<3	67	27	156	113
MW-3	06-12-92	1600*	NA	NA	NA	NA	NA
MW-3	09-14-92	40000*	NA	NA	NA	NA	NA
MW-3	10-07-92	Not sampled: well contained floating product					
MW-3	01-22-93	13000*	<3	10	8	28	23
MW-3	04-14-93	<50	<3	<5	3	25	<20
MW-3	09-30-93	17000*	<5	50	26	100	70
MW-3	11-16-93	Not analyzed: sampling for additional parameters was discontinued					
MW-4	11-12-92	Not analyzed: sampling for additional parameters was not initiated					
MW-5	11-12-92	Not analyzed: sampling for additional parameters was not initiated					
MW-6	11-12-92	Not analyzed: sampling for additional parameters was not initiated					
MW-7	11-12-92	Not analyzed: sampling for additional parameters was not initiated					
AS-2	09-30-93	Not analyzed: sampling for additional parameters was not initiated					

TPHD = Total petroleum hydrocarbons as diesel by EPA Method 3510/California DHS LUFT Method
µg/l = Micrograms per liter
NA = Not analyzed
* = Chromatogram does not match the typical diesel fingerprint, but appears to be weathered gasoline

152753



Base map from USGS 7.5' Quad. Maps:
Oakland East and Oakland West, California.
Photorevised 1980.

N

Scale : 0 2000 4000 Feet

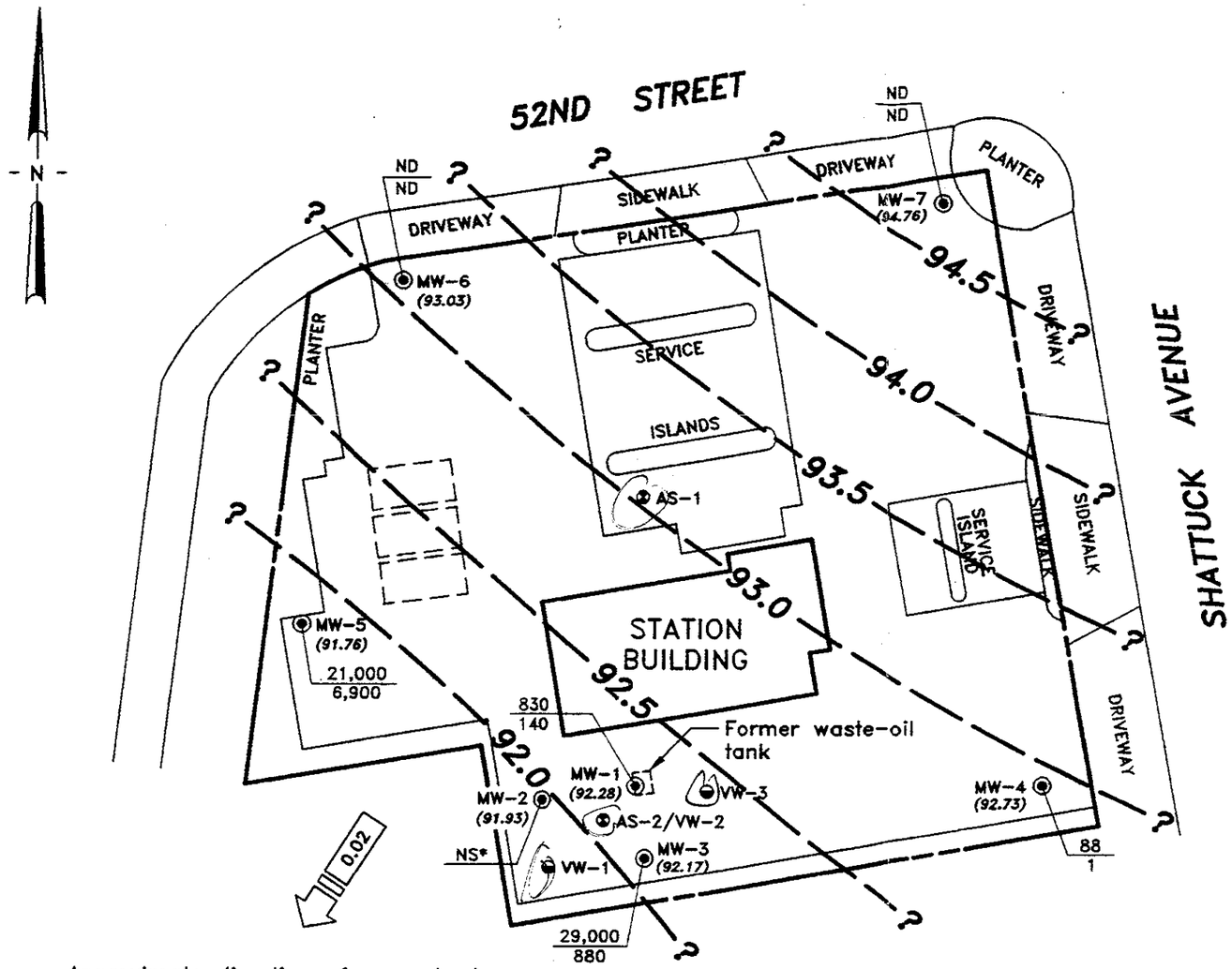
EMCON

ARCO PRODUCTS COMPANY
SERVICE STATION 6148, 5131 SHATTUCK AVENUE
QUARTERLY GROUNDWATER MONITORING
OAKLAND, CALIFORNIA

SITE LOCATION

FIGURE
1

PROJECT NO.
605-135.01



Approximate direction of groundwater flow showing gradient (Calculated using wells MW-4, MW-5, and MW-7)

EXPLANATION

- Groundwater monitoring well
- Vapor extraction well
- Vapor extraction well
- Existing underground gasoline storage tank
- (92.28) Groundwater elevation (Ft.–MSL) measured 3/20/95
- Groundwater elevation contour (Ft.–MSL)
- 830 / 140 — TPHG, concentration in groundwater (ug/l); sampled 3/20/95; Benzene concentration in groundwater (ug/l); sampled 3/20/95
- NS — Not sampled
- * — Floating product entered well during purging

EMCON

SCALE: 0 30 60 FEET
(Approximate)

ARCO PRODUCTS COMPANY
SERVICE STATION 6148, 5131 SHATTUCK AVENUE
QUARTERLY GROUNDWATER MONITORING
OAKLAND, CALIFORNIA

GROUNDWATER DATA
FIRST QUARTER 1995

FIGURE NO.
2

PROJECT NO.
805-135.03

APPENDIX A

FIELD DATA SHEETS, FIRST QUARTER 1995 GROUNDWATER MONITORING EVENT

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 1775-250.01 STATION ADDRESS : 5131 Shattuck Avenue DATE : 3 Monday

ARCO STATION # : 6148 FIELD TECHNICIAN : M. Gallegos DAY : 3-20-95

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	AS-1	Good	Good	Plug	ARCO missing	Good	15.47	15.47	ND	NA	16.00	
2	AS-2	↓	↓	↓	↓	↓	15.58	15.58	↓	↓	22.0	
3	MW-7						12.32	12.32			24.9	Water in Box
4	MW-6						12.13	12.13			26.5	Water in Box
5	MW-4						13.85	13.85			25.9	Water in Box
6	MW-1						15.75	15.75			25.8	
7	MW-5						14.92	14.92			24.9	
8	MW-3						15.60	15.60			25.8	
9	MW-2	↓	↓	↓	↓	↓	15.50	15.50	ND*	0.02	25.7	
												*product entered well during purge.

SURVEY POINTS ARE TOP OF WELL CASINGS

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-2500.01 SAMPLE ID: MW-1

PURGED BY: M. Gallegos CLIENT NAME: ARCO #6148

SAMPLED BY: ↓ LOCATION: Oakland, CA

TYPE: Ground Water V Surface Water ____ Treatment Effluent ____ Other ____

CASING DIAMETER (inches): 2 ____ 3 ____ 4 X 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 6.53

DEPTH TO WATER (feet): 15.75 CALCULATED PURGE (gal.): 19.69

DEPTH OF WELL (feet): 25.8 ACTUAL PURGE VOL. (gal.): 20.0

DATE PURGED: 3-20-95 Start (2400 Hr) 1310 End (2400 Hr) 1316

DATE SAMPLED: 3-20-95 Start (2400 Hr) 1324 End (2400 Hr) ____

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1311	6.5	6.67	455	65.7	Lt-BRN	HEAVY
1314	13.0	6.67	502	67.4	cloudy	moderate
1316	20.0	6.66	496	67.8	"	"

D. O. (ppm): NR ODOR: Sl. Sht. NR (COBALT 0 - 500) NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: ND

Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
____ 2" Bladder Pump	____ Bailer (Teflon®)	____ 2" Bladder Pump	____ Bailer (Teflon®)
____ Centrifugal Pump	____ Bailer (PVC)	____ DDL Sampler	____ Bailer (Stainless Steel)
____ Submersible Pump	____ Bailer (Stainless Steel)	____ Dipper	____ Submersible Pump
____ Well Wizard™	____ Dedicated	____ Well Wizard™	____ Dedicated
Other: ____		Other: ____	

WELL INTEGRITY: Good LOCK #: ____

REMARKS: All Samples taken

Meter Calibration: Date: 3/20/95 Time: ____ Meter Serial #: 9011 Temperature °F: ____

(EC 1000 ____ / ____) (DI ____) (pH 7 ____ / ____) (pH 10 ____ / ____) (pH 4 ____ / ____)

Location of previous calibration: MW-7

Signature: M. D. Gallegos Reviewed By: JB Page 1 of 7

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-2500/ SAMPLE ID: MW-2

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 6148

SAMPLED BY: ↓ LOCATION: Oakland, CA

TYPE: Ground Water V Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 6.66

DEPTH TO WATER (feet): 15.50 CALCULATED PURGE (gal.): 19.92

DEPTH OF WELL (feet): 25.7 ACTUAL PURGE VOL. (gal.): 10.0

DATE PURGED: 3-20-95 Start (2400 Hr) 1415 End (2400 Hr) 1420

DATE SAMPLED: 3-20-95 Start (2400 Hr) — End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1416	6.5	6.74	493	65.5	D.K.	Heavy
←	13.0	product	in well	no	samples	taken
—	20.0	—	—	—	—	—

D. O. (ppm): NR ODOR: Strong

COLOR (visual): NR (COBALT 0 - 500)

TURBIDITY (visual): NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT

- ___ 2" Bladder Pump
- X Centrifugal Pump
- ___ Submersible Pump
- ___ Well Wizard™
- ___ Bailer (Teflon®)
- ___ Bailer (PVC)
- ___ Bailer (Stainless Steel)
- ___ Dedicated

Other: ___

SAMPLING EQUIPMENT

- ___ 2" Bladder Pump
- ___ DDL Sampler
- ___ Dipper
- ___ Well Wizard™
- X Bailer (Teflon®)
- ___ Bailer (Stainless Steel)
- ___ Submersible Pump
- ___ Dedicated

Other: NA

WELL INTEGRITY: Good LOCK #: ___

REMARKS: 1cm on top of purge water product came into well during purging (-.02) no samples taken

Meter Calibration: Date: 3/20/95 Time: ___ Meter Serial #: 9011 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-7

Signature: [signature] Reviewed By: JB Page 2 of 7

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-2500l SAMPLE ID: MW-3

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 6148

SAMPLED BY: ↓ LOCATION: Oakland, CA

TYPE: Ground Water V Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 6.66

DEPTH TO WATER (feet): 15.60 CALCULATED PURGE (gal.): 19.92

DEPTH OF WELL (feet): 25.8 ACTUAL PURGE VOL. (gal.): 20.0

DATE PURGED: 3-20-95 Start (2400 Hr) 1345 End (2400 Hr) 1351

DATE SAMPLED: 3-20-95 Start (2400 Hr) 1400 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1346	6.5	6.57	488	65.2	Grey/Blk.	Moderate
1348	13.0	6.60	567	66.3	Cloudy	↓
1351	20.0	6.62	571	66.9	Grey/Blk	↓

D. O. (ppm): NR ODOR: Strong

COLOR (visual): NR (COBALT 0 - 500)

TURBIDITY (visual): NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR.

Parameters field filtered at this well: NR.

PURGING EQUIPMENT

- ___ 2" Bladder Pump
- ✓ Centrifugal Pump
- ___ Submersible Pump
- ___ Well Wizard™
- ___ Bailer (Teflon®)
- ___ Bailer (PVC)
- ___ Bailer (Stainless Steel)
- ___ Dedicated

Other: ___

SAMPLING EQUIPMENT

- ___ 2" Bladder Pump
- ___ DDL Sampler
- ___ Dipper
- ___ Well Wizard™
- X Bailer (Teflon®)
- ___ Bailer (Stainless Steel)
- ___ Submersible Pump
- ___ Dedicated

Other: ___

WELL INTEGRITY: Good. LOCK #: ___

REMARKS: All samples taken

[redacted] Sheen on top of purge water

Meter Calibration: Date: 3/20/95 Time: ___ Meter Serial #: 9011 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-7

Signature: [signature] Reviewed By: JB Page 3 of 7

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-2500l SAMPLE ID: MW-4

PURGED BY: M. Gallegos CLIENT NAME: ARCO #6148

SAMPLED BY: ↓ LOCATION: Oakland, CA

TYPE: Ground Water V Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 7.87

DEPTH TO WATER (feet): 13.85 CALCULATED PURGE (gal.): 23.61

DEPTH OF WELL (feet): 25.9 ACTUAL PURGE VOL. (gal.): 24.0

DATE PURGED: 3-20-95 Start (2400 Hr) 1233 End (2400 Hr) 1238

DATE SAMPLED: 3-20-95 Start (2400 Hr) 1246 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1234	8.0	6.65	483	66.8	BRN	HEAVY
1236	16.0	6.67	486	67.9	LT BRN	MOD SED
1238	24.0	6.59	481	68.3	J	J

D. O. (ppm): NR ODOR: None COLOR: NR (COBALT 0 - 500) TURBIDITY: NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT

___ 2" Bladder Pump ___ Bailer (Teflon®)
X Centrifugal Pump ___ Bailer (PVC)
___ Submersible Pump ___ Bailer (Stainless Steel)
___ Well Wizard™ ___ Dedicated
Other: ___

SAMPLING EQUIPMENT

___ 2" Bladder Pump X Bailer (Teflon®)
___ DDL Sampler ___ Bailer (Stainless Steel)
___ Dipper ___ Submersible Pump
___ Well Wizard™ ___ Dedicated
Other: ___

WELL INTEGRITY: Good LOCK #: ___

REMARKS: All Samples taken

Meter Calibration: Date: 3/20/95 Time: ___ Meter Serial #: 9011 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-7

Signature: [signature] Reviewed By: JB Page 4 of 7

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WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-2500/ SAMPLE ID: MW-5

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 6148

SAMPLED BY: ↓ LOCATION: Oakland, CA

TYPE: Ground Water V Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 6.52

DEPTH TO WATER (feet): 14.82 CALCULATED PURGE (gal.): 19.56

DEPTH OF WELL (feet): 24.9 ACTUAL PURGE VOL. (gal.): 20.0

DATE PURGED: 3-20-95 Start (2400 Hr) 1433 End (2400 Hr) 1439

DATE SAMPLED: 3-20-95 Start (2400 Hr) 1446 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1434	6.5	7.00	481	64.6	BRN	HEAVY
1436	13.0	6.60	603	66.0	Cloudy	↓
1439	20.0	6.60	611	66.3	BRN	↓

D. O. (ppm): NR ODOR: Slight. NR (COBALT 0 - 500) NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: MS Parameters field filtered at this well: N/R.

PURGING EQUIPMENT

___ 2" Bladder Pump	___ Bailer (Teflon®)	___ Centrifugal Pump	___ Bailer (PVC)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Well Wizard™	___ Dedicated

Other: ___

SAMPLING EQUIPMENT

___ 2" Bladder Pump	X Bailer (Teflon®)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Dipper	___ Submersible Pump	___ Well Wizard™	___ Dedicated

Other: ___

WELL INTEGRITY: Good LOCK #: ___

REMARKS: All Samples taken

Meter Calibration: Date: 3/20/95 Time: ___ Meter Serial #: 9011 Temperature °F: ___

(EC 1000 ___ / ___) (DI ___) (pH 7 ___ / ___) (pH 10 ___ / ___) (pH 4 ___ / ___)

Location of previous calibration: MW-7

Signature: [signature] Reviewed By: JB Page 5 of 7

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-2500/ SAMPLE ID: MW-6

PURGED BY: M. Gallegos CLIENT NAME: ARCO #6148

SAMPLED BY: ↓ LOCATION: Oakland, CA

TYPE: Ground Water V Surface Water ____ Treatment Effluent ____ Other ____

CASING DIAMETER (inches): 2 ____ 3 ____ 4 X 4.5 ____ 6 ____ Other ____

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 9.38

DEPTH TO WATER (feet): 12.13 CALCULATED PURGE (gal.): 28.14

DEPTH OF WELL (feet): 26.5 ACTUAL PURGE VOL. (gal.): 28.5

DATE PURGED: 3-20-95 Start (2400 Hr) 1201 End (2400 Hr) 1310

DATE SAMPLED: 3-20-95 Start (2400 Hr) 1318 End (2400 Hr) ____

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1303	9.5	6.42	405	65.0	BRN	Heavy
1306	19.0	6.83	414	66.2	Lt-BRN	moderate
	28.5	6.90	415	66.2	BRN	Heavy

D. O. (ppm): NR ODOR: None.

COLOR (COBALT 0 - 500): NR

TURBIDITY (NTU 0 - 200 or 0 - 1000): NR

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT

- ____ 2" Bladder Pump
- X Centrifugal Pump
- ____ Submersible Pump
- ____ Well Wizard™
- ____ Bailer (Teflon®)
- ____ Bailer (PVC)
- ____ Bailer (Stainless Steel)
- ____ Dedicated
- Other: ____

SAMPLING EQUIPMENT

- ____ 2" Bladder Pump
- ____ DDL Sampler
- ____ Dipper
- ____ Well Wizard™
- X Bailer (Teflon®)
- ____ Bailer (Stainless Steel)
- ____ Submersible Pump
- ____ Dedicated
- Other: ____

WELL INTEGRITY: Good LOCK #: ____

REMARKS: MW Sample taken

Meter Calibration: Date: 3/20/95 Time: ____ Meter Serial #: 9011 Temperature °F: ____

(EC 1000 ____ / ____) (DI ____) (pH 7 ____ / ____) (pH 10 ____ / ____) (pH 4 ____ / ____)

Location of previous calibration: Mw-7

Signature: [signature] Reviewed By: JB Page 6 of 7

Rev. 3, 2/94

EMCON ASSOCIATES

WATER SAMPLE FIELD DATA SHEET

PROJECT NO: 1775-250.01 SAMPLE ID: MW-7

PURGED BY: M. Gallegos CLIENT NAME: ARCO # 6148

SAMPLED BY: ✓ LOCATION: OAKland, CA

TYPE: Ground Water ✓ Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 9.46

DEPTH TO WATER (feet): 12.32 CALCULATED PURGE (gal.): 28.38

DEPTH OF WELL (feet): 26.8 ACTUAL PURGE VOL. (gal.): 28.5

DATE PURGED: 3-20-95 Start (2400 Hr) 1126 End (2400 Hr) 1132

DATE SAMPLED: 3-20-95 Start (2400 Hr) 1140 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1128	9.5	6.60	417	65.5	Lt Brn	Heavy
1130	19.0	6.59	451	67.8	↓	moderate
1132	28.5	6.61	458	67.4	↓	"

D. O. (ppm): NR ODOR: None. NR (COBALT 0 - 500) NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: FB-1

Parameters field filtered at this well: NR

PURGING EQUIPMENT

- ___ 2" Bladder Pump
- X Centrifugal Pump
- ___ Submersible Pump
- ___ Well Wizard™
- ___ Bailer (Teflon®)
- ___ Bailer (PVC)
- ___ Bailer (Stainless Steel)
- ___ Dedicated

Other: ___

SAMPLING EQUIPMENT

- ___ 2" Bladder Pump
- ___ DDL Sampler
- ___ Dipper
- ___ Well Wizard™
- X Bailer (Teflon®)
- ___ Bailer (Stainless Steel)
- ___ Submersible Pump
- ___ Dedicated

Other: ___

WELL INTEGRITY: Water in box / Good LOCK #: ___

REMARKS: Mid Sampling Helicon

Meter Calibration: Date: 3/20/95 Time: 1110 Meter Serial #: 9011 Temperature °F: 59.5

(EC 1000 1074/1000) (DI ___) (pH 7 7.0 / 7.00) (pH 10 9.85/10.0) (pH 4 4.00/ ___)

Location of previous calibration: ___

Signature: [signature] Reviewed By: JB Page 7 of 7

APPENDIX B

ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY DOCUMENTATION, FIRST QUARTER 1995

File under 20805-135.003
ARCO 6148

Columbia Analytical Services, Inc.

March 31, 1995 Service Request No. S950345

John Young
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

20805-135.003

Re: **ARCO Facility No. 6148 / ~~1775-250-01~~**

Dear Mr. Young:

Attached are the results of the water sample(s) submitted to our lab on March 20, 1995. For your reference, these analyses have been assigned our service request number S950345.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and CAS is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.

Steven L. Green
Project Chemist

Annelise J. Bazar
Regional QA Coordinator

SLG/ajb

001

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the MRL
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL, but greater than or equal to the MDL

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S950345
Project:	ARCO Facility No. 6148 / EMCON Project No. 1775-250.01	**Date Collected:**	3/20/95
Sample Matrix:	Water	**Date Received:**	3/21/95
		Date Extracted:	NA
		Date Analyzed:	3/29/95

BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method

Analyte:		**TPH as Gasoline**	**Benzene**	**Toluene**	**Ethyl-benzene**	**Xylenes, Total**
Units:		ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
Method Reporting Limit:		50	0.5	0.5	0 5	0.5
Sample Name	**Lab Code**					
MW-1 (25)	S950345-001	830	140	5.0	41	110
MW-3 (25)	S950345-002	29,000	880	190	760	2,000
MW-4 (25)	S950345-003	88	1.0	ND	ND	0.7
MW-5 (24)	S950345-004	21,000	6,900	450	800	1,300
MW-6 (26)	S950345-005	ND	ND	ND	ND	ND
MW-7 (26)	S950345-006	ND	ND	ND	ND	ND
FB-1	S950345-007	ND	ND	ND	ND	ND
Method Blank	S950329-WB	ND	ND	ND	ND	ND

Approved By: _____ Date: 4/3/95

5ABTXGAS/061694

003

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: *ARCO Products Company / # 1775-250.01*
Sample Matrix: Water

Service Request: L951763
Date Collected: 3/21/95
Date Received: 3/22/95
Date Extracted: 3/28/95
Date Analyzed: 3/28/95

Total Recoverable Petroleum Hydrocarbons
EPA Method 418.1
Units: mg/L (ppm)

Sample Name	Lab Code	MRL	Result
MW-3 (25)	L951763-001	0.5	16
Method Blank	L951763-MB	0.5	ND

MRL Method Reporting Limit
ND None Detected at or above the method reporting limit.

Approved By: Eydie Schwartz Date: 3/29/95

004

IAMRL/060194
L951763.XLS - 418w 3/29/95

Page No

6925 CANOGA AVENUE ■ CANOGA PARK, CA 91303 ■ 818 587-5550 ■ FAX 818 587-5555

APPENDIX A

LABORATORY QC RESULTS

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S950345
Project:	ARCO Facility No. 6148 / EMCON Project No. 1775-250.01	**Date Collected:**	3/20/95
Sample Matrix:	Water	**Date Received:**	3/21/95
		Date Extracted:	NA
		Date Analyzed:	3/29/95

Surrogate Recovery Summary
BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method

Sample Name	Lab Code	Percent Recovery α,α,α-Trifluorotoluene
MW-1 (25)	S950345-001	96
MW-3 (25)	S950345-002	101
MW-4 (25)	S950345-003	99
MW-5 (24)	S950345-004	95
MW-6 (26)	S950345-005	91
MW-7 (26)	S950345-006	93
FB-1	S950345-007	91
MW-7 (26) MS	S950345-006MS	94
MW-7 (26) DMS	S950345-006DMS	96
Method Blank	S950329-WB	93

CAS Acceptance Limits: 69-116

Approved By: _____ Date: 4/3/95

SUR1/062994

006

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Facility No. 6148 / EMCON Project No. 1775-250.01

Service Request: S950345
Date Analyzed: 3/29/95

Initial Calibration Verification (ICV) Summary
BTEX and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	25.3	101	85-115
Toluene	25	24.6	98	85-115
Ethylbenzene	25	24.9	100	85-115
Xylenes, Total	75	72.3	96	85-115
Gasoline	250	225	90	90-110

Approved By: _____ Date: 4/3/95

ICV25AL/060194

007

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S950345
Project:	ARCO Facility No. 6148 / EMCON Project No. 1775-250 01	**Date Collected:**	3/20/95
Sample Matrix:	Water	**Date Received:**	3/21/95
		Date Extracted:	NA
		Date Analyzed:	3/29/95

Matrix Spike/Duplicate Matrix Spike Summary
BTE
EPA Methods 5030/8020
Units: ug/L (ppb)

Sample Name: MW-7 (26)
Lab Code: S950345-006

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Benzene	25	25	ND	24.8	24.5	99	98	75-135	1
Toluene	25	25	ND	23.9	23.7	96	95	73-136	1
Ethylbenzene	25	25	ND	24.2	23.8	97	95	69-142	2

Approved By: _____ Date: 4/3/95

DMS1S/060194

008

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Service Request:**	L951763
Project:	ARCO Products Company / # 1775-250.01	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	3/28/95
		Date Analyzed:	3/28/95

Laboratory Control Sample/Duplicate Laboratory Control Sample Summary *
Total Recoverable Petroleum Hydrocarbons (TRPH) / Oil & Grease
EPA Methods 418.1/413.2
Units: mg/L (ppm)

	True Value		Result		Percent Recovery			
Analyte	LCS	DLCS	LCS	DLCS	LCS	DLCS	CAS Acceptance Limits	**Relative Percent Difference**
TRPH / O&G	2.09	2.09	1.89	2.00	90	96	75-125	6

* Sample quantity was insufficient to perform matrix spike and matrix spike duplicate. Three separate, replicate one liter samples are required to analyze sample and spikes.

NA Not Applicable

Approved By: Eydie Schwartz Date: 3/29/95

DLCS/060194
L951763 XLS - genlcs3 3/29/95

6925 CANOGA AVENUE ■ CANOGA PARK, CA 91303 ■ 818 587-5550 ■ FAX 818 587-5555

APPENDIX B

CHAIN OF CUSTODY

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/437-2400 • Fax 408/437-9356

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 17075.00

Chain of Custody

ARCO Facility no. 6148	City (Facility) OAKLAND	Project manager (Consultant) John Young	Laboratory name CAS
ARCO engineer Michael Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) 453-7300	Fax no. (Consultant) 453-0452
Consultant name EMCON	Address (Consultant) 1921 Ringwood Avenue SJ		Contract number

Method of shipment: Sampler will deliver

Special detection Limit/reporting: lowest possible

Special QA/QC: AS Normal

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐
MW-1(25')	1			X		X	HCl	3/20/95	1324		X									
MW-2( )									—		X	Product	in	well					no samples	
MW-3(25')	2							3/20/95	1400		X			X						
MW-4(25')	3								1246		X									
MW-5(24')	4								1446		X									
MW-6(26')	5								1318		X									
MW-7(26')	6								1140		X									
FB-1	7								1455		X									

Remarks: GS/CAS #L951763
1775-250.01

Lab number: 9950345

Turnaround time

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☐ X

Condition of sample: OK		Temperature received: Cool	
Relinquished by sampler	Date 3/20/95	Time 1640	Received by Joanne Brown
Relinquished by w/ Custody Seal Joanne Brown	Date 3/21/95	Time 1600	Received by
Relinquished by	Date	Time	Received by laboratory — Date 3/22/95 — Time 1100

CAS-SJ: GBTEX CAS-L: 418.1

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant

APC-3292 (2-91)

L951763

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