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

Date March 31, 1996
Project 20805-135.003

To:

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	Fourth quarter 1995 groundwater monitoring results and remediation system performance evaluation report for ARCO service station 6148, Oakland, California

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

John C. Young
Project Manager

ENVIRONMENTAL PROTECTION
96 MAR 21 PM 2:32

cc: Kevin Graves, RWQCB - SFBR
Michael Whelan, ARCO Products Company
Ivy Inouye, EMCON
File

ARCO Products Company

Date:

March 31, 1996

Re: ARCO Station #

6148 • 5131 Shattuck Avenue • Oakland, CA
Fourth Quarter 1995 Groundwater Monitoring Results and
Remediation System Performance Evaluation 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

March 4, 1996
Project 20805-135.003

Mr. Michael Whelan
ARCO Products Company
P.O. Box 612530
San Jose, California 95161

Re: Fourth quarter 1995 groundwater monitoring program results and remediation system performance evaluation report, ARCO service station 6148, Oakland, California

Dear Mr. Whelan:

This letter presents the results of the fourth quarter 1995 groundwater monitoring program at ARCO Products Company (ARCO) service station 6148, 5131 Shattuck Avenue, Oakland, California (Figure 1). Operation and performance data for the on-site soil-vapor extraction (SVE) remediation system during fourth quarter 1995 are also included. The quarterly monitoring program complies with Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

MONITORING PROGRAM FIELD PROCEDURES

A program of quarterly groundwater monitoring was initiated during the first quarter of 1992 to provide information concerning water quality, flow direction, and gradient consistent with ACHCSA and Regional Water Quality Control Board (RWQCB) requirements for underground fuel tank investigations. Water levels are measured quarterly in wells MW-1 through MW-7. Well MW-7 is sampled semiannually, during the first and third quarters of the year. Wells MW-1 through MW-6 are sampled quarterly.

Beginning in the first quarter of 1996, wells MW-6 and MW-7 will be sampled annually, during the first quarter of the year. Wells MW-1 and MW-4 will be sampled semiannually, during the first and third quarters of the year. Wells MW-2, MW-3, and MW-5 will be sampled quarterly. Water levels will be measured in all wells quarterly.

EMCON performed the fourth quarter 1995 groundwater monitoring event on November 16, 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-6 for laboratory analysis, and (3) directing a state-certified laboratory to analyze the groundwater samples. Copies of all field data

sheets from the fourth quarter 1995 groundwater monitoring event are included in Appendix A.

MONITORING PROGRAM RESULTS

Results of the fourth quarter 1995 groundwater monitoring event are summarized in Table 1 and illustrated in Figure 2. Historical groundwater elevation data are summarized in Table 2. Table 3 summarizes historical laboratory data for analysis of petroleum hydrocarbons and their constituents. Table 4 summarizes historical laboratory data for volatile organic compound (VOC) and semivolatile organic compound (SVOC) analyses. Historical laboratory data for metals analyses are summarized in Table 5. Copies of the fourth quarter 1995 analytical results and chain-of-custody documentation are included in Appendix B.

Groundwater elevation collected data on November 16, 1995, indicate that groundwater beneath the site flows southwest with an approximate hydraulic gradient of 0.012 foot per foot. Figure 2 illustrates groundwater contours and analytical data for the fourth quarter of 1995.

REMEDIATION SYSTEM PERFORMANCE EVALUATION

Soil-Vapor Extraction System

The SVE system was initially activated on September 27, 1995. Table 6 summarizes SVE system operation and performance data from initial system startup to the end of the fourth quarter 1995 reporting period, January 1, 1996. Historical SVE system monitoring data log sheets are included in Appendix C.

Table 5 also summarizes hydrocarbon removal rates, pounds of hydrocarbons removed this period, and cumulative pounds of hydrocarbons removed from system startup to the end of the fourth quarter 1995 reporting period, January 1, 1996. Approximately 731.7 pounds (118 gallons) of hydrocarbons were recovered by SVE system operation from initial system startup to the end of the fourth quarter 1995 reporting period. The calculations and assumptions made for estimating hydrocarbon removal rates for the SVE system are explained in the footnotes for Table 6.

Table 7 summarizes the operating status of individual vapor extraction wells from startup to the end of the fourth quarter 1995 reporting period. To maximize hydrocarbon removal rates, each vapor extraction well was brought on-line or closed depending on the TVHG concentrations in extracted vapor from the well.

Copies of field monitoring data sheets for the SVE system operation during the fourth quarter 1995 are provided in Appendix D. Copies of the analytical results for all air samples collected during the fourth quarter of 1995 are provided in Appendix E.

Air-Sparge and Air-Bubbling Systems

The AS and air-bubbling systems will be activated in the upcoming quarters, and hence are not discussed further in this report.

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 the site activities performed during the fourth quarter of 1995 and those anticipated for the first quarter of 1996.

Fourth Quarter 1995 Activities

- Prepared and submitted quarterly groundwater monitoring report for third quarter 1995.
- Performed quarterly groundwater monitoring for fourth quarter 1995.
- Performed operation and maintenance of the SVE remediation system for fourth quarter 1995.

First Quarter 1996 Activities

- Prepared and submitted *Remedial Well Installation Report, ARCO Service Station 6148* (EMCON, February 1, 1996).

Work Anticipated for First Quarter 1996

- Prepare and submit quarterly groundwater monitoring report for fourth quarter 1995.
- Perform quarterly groundwater monitoring for first quarter 1996.
- Restart and perform operation and maintenance of the SVE system.
- Perform startup of the AS and air-bubbling systems.

Please call if you have questions.

Sincerely,

EMCON

Valli Voruganti
Project Engineer

John C. Young, R.G. 6407
Project Manager

REGISTERED GEOLOGIST
JOHN CHARLES YOUNG
7/96
NO. 6407
STATE OF CALIFORNIA

Attachments:

Table 1 -	Groundwater Monitoring Data, Fourth Quarter 1995
Table 2 -	Historical Groundwater Elevation Data
Table 3 -	Historical Groundwater Analytical Data, Petroleum Hydrocarbons and Their Constituents
Table 4 -	Historical Groundwater Analytical Data, Volatile and Semivolatile Organic Compounds
Table 5 -	Historical Groundwater Analytical Data, Metals
Table 6 -	Soil-Vapor Extraction System Operation and Performance Data
Table 7 -	Soil Vapor Extraction Well Data
Figure 1 -	Site Location
Figure 2 -	Groundwater Data, Fourth Quarter 1995
Appendix A -	Field Data Sheets, Fourth Quarter 1995 Groundwater Monitoring Event
Appendix B -	Analytical Results and Chain-of-Custody Documentation, Fourth Quarter 1995
Appendix C -	SVE System Monitoring Data Log Sheets
Appendix D -	Operation and Maintenance Field Data Sheets, SVE and Air-Sparge Systems, Fourth Quarter 1995
Appendix E -	Analytical Results and Chain-of-Custody Documentation for SVE System Air Samples, Fourth Quarter 1995

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

Table 1
Groundwater Monitoring Data
Fourth Quarter 1995

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date. 2-12-96

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	Oil & Grease SM 5520C	TRPH EPA 418.1	TPHD LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L
MW-1	11-16-95	107.80	17.64	90.16	ND	SW	0.012	11-16-95	<50	5.6	<0 5	1.4	1.2	55	--	--	--	--
MW-2	11-16-95	107.28	17.36	89.92	ND	SW	0.012	11-16-95	360	45	1 3	7.1	7.5	210	--	--	--	--
MW-3	11-16-95	107.61	17.58	90.03	ND	SW	0.012	11-16-95	13000	210	<20	320	1000	790	--	--	8.3	--
MW-4	11-16-95	106.71	16.10	90.61	ND	SW	0.012	11-16-95	<50	<0.5	<0.5	<0.5	<0 5	6	--	--	--	--
MW-5	11-16-95	106.60	16.69	89.91	ND	SW	0 012	11-16-95	1800	470	<5	17	5	1000	--	--	--	--
MW-6	11-16-95	105.13	14 34	90.79	ND	SW	0.012	11-16-95	<60	<0.5	<0 5	<0.5	<0 5	--	--	--	--	--
MW-7	11-16-95	107.05	15.30	91.75	ND	SW	0 012	11-16-95	Not sampled: not scheduled for chemical analysis									

ft-MSL: elevation in feet, relative to mean sea level
MWN ground-water flow direction and gradient apply to the entire monitoring well network
ft/ft: foot per foot
TPHG: total petroleum hydrocarbons as gasoline, California DHS LUFT Method
µg/L: micrograms per liter
EPA: United Statest Environmental Protection Agency
MTBE: methyl-tert-butyl ether
SM: standard method
mg/L: milligrams per liter
TRPH: total recoverable petroleum hydrocarbons
TPHD: total petroleum hydrocarbons as diesel, California DHS LUFT Method
ND. none detected
SW: southwest
--. not analyzed

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Table 2
Historical Groundwater Elevation Data

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 02-12-96

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater Flow Direction MWN	Hydraulic Gradient 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
MW-1	06-06-95	108.03	17.68	90.35	ND	SW	0.016
MW-1	08-24-95	107 80	17 45	90.35	ND	SW	0.014
MW-1	11-16-95	107.80	17.64	90.16	ND	SW	0.012

Table 2
Historical Groundwater Elevation Data

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date 02-12-96

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater Flow Direction MWN	Hydraulic Gradient 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
MW-2	06-06-95	107.43	17 43	90.00	ND	SW	0.016
MW-2	08-24-95	107.28	17.22	90.06	ND	SW	0.014
MW-2	11-16-95	107.28	17.36	89.92	ND	SW	0.012

Table 2
Historical Groundwater Elevation Data

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date. 02-12-96

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater Flow Direction MWN	Hydraulic Gradient 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
MW-3	06-06-95	107.77	17.54	90.23	ND	SW	0.016
MW-3	08-24-95	107.61	17.42	90.19	ND	SW	0.014
MW-3	11-16-95	107.61	17.58	90.03	ND	SW	0.012

Table 2
Historical Groundwater Elevation Data

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 02-12-96

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater 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-4	06-06-95	106.58	15.70	90.88	ND	SW	0.016
MW-4	08-24-95	106.71	15 86	90.85	ND	SW	0.014
MW-4	11-16-95	106.71	16.10	90.61	ND	SW	0.012
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
MW-5	06-06-95	106.68	16.61	90.07	ND	SW	0.016
MW-5	08-24-95	106.60	16.47	90.13	ND	SW	0.014
MW-5	11-16-95	106.60	16.69	89.91	ND	SW	0.012

Table 2
Historical Groundwater Elevation Data

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 02-12-96

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater 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-6	06-06-95	105.16	13.95	91.21	ND	SW	0.016
MW-6	08-24-95	105.13	14.07	91.06	ND	SW	0.014
MW-6	11-16-95	105.13	14 34	90.79	ND	SW	0.012
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
MW-7	06-06-95	107.08	14.59	92.49	ND	SW	0.016
MW-7	08-24-95	107.05	14.64	92.41	ND	SW	0.014
MW-7	11-16-95	107.05	15.30	91.75	ND	SW	0.012

Table 2
Historical Groundwater Elevation Data

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 02-12-96

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater Flow Direction MWN	Hydraulic Gradient foot/foot
AS-1	09-30-93	107.71	18 31	89.40	ND	NR	NR
AS-2	08-11-95	107.38	17 46	89.92	ND	NR	NR
AS-3	08-11-95	107.89	19.30	88.59	ND	NR	NR
AS-4	08-11-95	106 81	16 51	90.30	ND	NR	NR
AS-5	08-11-95	106 24	16.52	89.72	ND	NR	NR

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
Petroleum Hydrocarbons and Their Constituents

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-12-95

Well Designation	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	Oil & Grease SM 5520C	TRPH EPA 418.1	TPHD LUFT Method
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L
MW-1	03-18-92	790	310	26	12	44	--	--	<0.5	1.4	<50
MW-1	06-12-92	1000	290	15	10	30	--	--	<0.5	--	<50
MW-1	09-14-92	1000	370	6.5	6.5	17	--	--	--	0.9	<80
MW-1	10-07-92	590	200	19	6.7	19	--	--	<0.5	--	<50
MW-1	01-22-93	1200	370	57	18	39	--	--	--	--	--
MW-1	04-14-93	140	46	<2.5	<2.5	<2.5	--	--	--	--	--
MW-1	09-30-93	220	64	0.9	2.2	4	--	--	--	--	--
MW-1	11-16-93	180	53	0.7	1.7	4.1	--	--	--	--	--
MW-1	02-02-94	250	93	<0 5	1 9	1	--	--	--	--	--
MW-1	04-29-94	350	99	1.3	3 9	11	--	--	--	--	--
MW-1	08-02-94	210	82	<1	<1	2.5	--	--	--	--	--
MW-1	11-16-94	650	260	38	6.1	15	--	--	--	--	--
MW-1	03-20-95	830	140	5	41	110	--	--	--	--	--
MW-1	06-06-95	210	30	<0.5	7.3	16	--	--	--	--	--
MW-1	08-24-95	Not sampled: well was inaccessible due to construction									
MW-1	11-16-95	<50	5.6	<0.5	1.4	1.2	55	--	--	--	--
MW-2	03-18-92	8400	1400	1000	220	870	--	--	1.2	3	230*
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	--	--	--	--	--
MW-2	04-29-94	11000	1400	1200	360	1400	--	--	--	--	--
MW-2	08-02-94	4900	800	290	120	620	--	--	--	--	--
MW-2	11-16-94	49000	3300	8300	1400	7200	--	--	--	--	--
MW-2	03-20-95	Not sampled: floating product entered well during purging									
MW-2	06-06-95	1200	60	21	35	140	--	--	--	--	--
MW-2	08-24-95	Not sampled: well was inaccessible due to construction									
MW-2	11-16-95	360	45	1.3	7 1	7.5	210	--	--	--	--

Table 3
Historical Groundwater Analytical Data
Petroleum Hydrocarbons and Their Constituents

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-12-95

Well Designation	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	Oil & Grease SM 5520C	TRPH EPA 418.1	TPHD LUFT Method
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L
MW-3	03-18-92	20000	3200	560	380	1000	--	--	78	8.1	2800*
MW-3	06-12-92	46000	3400	4200	1300	5400	--	--	16	--	1600*
MW-3	09-14-92	53000	4300	5700	1300	7300	--	--	--	5.5	40000*
MW-3	10-07-92	Not sampled: well contained floating product									
MW-3	01-22-93	35000	2100	1400	1200	4400	--	--	31	--	13000*
MW-3	04-14-93	13000	1800	390	990	3500	--	--	26	--	<50
MW-3	09-30-93	79000	2400	3400	1900	8100	--	--	23	--	17000*
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-3	06-06-95	22000	450	54	380	1300	--	--	--	7.1	--
MW-3	08-24-95	Not sampled: well was inaccessible due to construction									
MW-3	11-16-95	13000	210	<20	320	1000	790	--	--	8.3	--
MW-4	11-12-92	77	32	<0.5	<0.5	<0.5	--	--	--	--	--
MW-4	01-22-93	170	66	0.8	<0.5	1.5	--	--	--	--	--
MW-4	04-14-93	<50	4.6	<0.5	<0.5	<0.5	--	--	--	--	--
MW-4	09-30-93	52	13	<0.5	<0.5	<0.5	--	--	--	--	--
MW-4	11-16-93	230	34	<0.5	<0.5	<0.5	--	--	--	--	--
MW-4	02-02-94	<50	3.9	<0.5	<0.5	<0.5	--	--	--	--	--
MW-4	04-29-94	<50	4.2	<0.5	<0.5	<0.5	--	--	--	--	--
MW-4	08-02-94	<50	3.8	<0.5	<0.5	<0.5	--	--	--	--	--
MW-4	11-16-94	110	31	<0.5	<0.5	<0.5	--	--	--	--	--
MW-4	03-20-95	88	1	<0.5	<0.5	0.7	--	--	--	--	--
MW-4	06-06-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--
MW-4	08-24-95	Not sampled: well was inaccessible due to construction									
MW-4	11-16-95	<50	<0.5	<0.5	<0.5	<0.5	6	--	--	--	--

Table 3
Historical Groundwater Analytical Data
Petroleum Hydrocarbons and Their Constituents

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-12-95

Well Designation	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	Oil & Grease SM 5520C	TRPH EPA 418.1	TPHD LUFT Method
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L
MW-5	11-12-92	2900	1300	12	67	18	--	--	--	--	--
MW-5	01-22-93	17000	5000	780	260	330	--	--	--	--	--
MW-5	04-14-93	12000	4600	<50	180	130	--	--	--	--	--
MW-5	09-30-93	4500	1100	<10	39	16	--	--	--	--	--
MW-5	11-16-93	3300	700	<10	22	<10	--	--	--	--	--
MW-5	02-02-94	10000	3000	65	240	78	--	--	--	--	--
MW-5	04-29-94	7600	2400	27	130	44	--	--	--	--	--
MW-5	08-02-94	1900	680	<10	24	<10	--	--	--	--	--
MW-5	11-16-94	17000	5900	700	440	320	--	--	--	--	--
MW-5	03-20-95	21000	6900	450	800	1300	--	--	--	--	--
MW-5	06-06-95	6500	1700	<20	120	69	--	--	--	--	--
MW-5	08-24-95	Not sampled: well was inaccessible due to construction									
MW-5	11-16-95	1800	470	<5	17	5	1000	--	--	--	--
MW-6	11-12-92	51	2 6	<0.5	<0.5	<0.5	--	--	--	--	--
MW-6	01-22-93	<50	1.2	<0.5	<0.5	<0.5	--	--	--	--	--
MW-6	04-14-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--
MW-6	09-30-93	74	2	<0.5	<0 5	<0.5	--	--	--	--	--
MW-6	11-16-93	72	2.6	<0.5	<0 5	<0.5	--	--	--	--	--
MW-6	02-02-94	61	2 2	<0.5	<0.5	<0.5	--	--	--	--	--
MW-6	04-29-94	<50	0.6	<0.5	<0.5	<0.5	--	--	--	--	--
MW-6	08-02-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--
MW-6	11-16-94	<50	1.1	<0.5	<0.5	<0.5	--	--	--	--	--
MW-6	03-20-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--
MW-6	06-06-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--
MW-6	08-24-95	<50	<0.5	<0.5	<0.5	<0 5	<3	--	--	--	--
MW-6	11-16-95	<60	<0.5	<0 5	<0.5	<0.5	--	--	--	--	--

Table 3
Historical Groundwater Analytical Data
Petroleum Hydrocarbons and Their Constituents

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-12-95

Well Designation	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	Oil & Grease SM 5520C	TRPH EPA 418 1	TPHD LUFT Method
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L
MW-7	11-12-92	<50	1.8	<0 5	<0.5	<0.5	--	--	--	--	--
MW-7	01-22-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--
MW-7	04-14-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--
MW-7	09-30-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--
MW-7	11-16-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--
MW-7	02-02-94	<50	<0.5	<0.5	<0.5	<0 5	--	--	--	--	--
MW-7	04-29-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--
MW-7	08-02-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--
MW-7	11-16-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--
MW-7	03-20-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--
MW-7	06-06-95	Not sampled: not scheduled for chemical analysis									
MW-7	08-24-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	--
MW-7	11-16-95	Not sampled: not scheduled for chemical analysis									
AS-1	09-30-93	<50	1.2	<0.5	<0.5	<0 5	--	--	--	--	--
AS-2	08-11-95	310	15	2.6	5 9	44	--	--	--	--	--
AS-3	08-11-95	10000	1700	380	490	1600	--	--	--	--	--
AS-4	08-11-95	<50	<0.5	<0.5	<0 5	<0.5	--	--	--	--	--
AS-5	08-11-95	<50	<0.5	<0.5	<0 5	<0.5	--	--	--	--	--

TPHG: total petroleum hydrocarbons as gasoline, California DHS LUFT Method
µg/L: micrograms per liter
EPA: United Statest Environmental Protection Agency
MTBE: Methyl-tert-butyl ether
SM: standard method
mg/L: milligrams per liter
TRPH: total recoverable petroleum hydrocarbons
TPHD: total petroleum hydrocarbons as diesel, California DHS LUFT Method
- - - not analyzed
*: chromatogram does not match the typical diesel fingerprint, but appears to be weathered gasoline

Table 4
Historical Groundwater Analytical Data
Volatile and Semivolatile Organic Compounds

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-12-95

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 5030/601						Semivolatile Organic Compounds by EPA Method 3510/8270			
		Tetrachloro-ethene	Trichloro-ethene	Chloroform	cis-1,2-Dichloro-ethene	Vinyl Chloride	1,1-Dichloro-ethane	Naphthalene	2-Methyl-naphthalene	Bis (2ethylhexyl) 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-1	03-18-92	13	1.2	ND	ND	ND	ND	--	--	--	--
MW-1	06-12-92	18	1.4	ND	ND	ND	ND	--	--	--	--
MW-1	09-14-92	15	1 5	ND	ND	ND	ND	--	--	--	--
MW-1	10-07-92	23	1.5	0.6	ND	ND	ND	--	--	--	--
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	--	--	--	--
MW-1	09-30-93	19	1.1	0 7	ND	ND	ND	--	--	--	--
MW-1	11-16-93	22	0.9	ND	ND	ND	ND	--	--	--	--
MW-1	02-02-94	11	1.1	ND	ND	ND	ND	--	--	--	--
MW-1	04-29-94	13	1.3	0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-1	08-02-94	15	1.4	0.7	0.7	<0 5	<0 5	--	--	--	--
MW-1	11-16-94	12	1.1	0.5	1.2	<0.5	<0 5	--	--	--	--
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	--	--	--	--
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	--	--	--	--
MW-2	04-29-94	9 4	1.9	<0.5	2.2	<0.5	<0.5	--	--	--	--
MW-2	08-02-94	15	2	<0 5	2.9	<0.5	<0 5	--	--	--	--
MW-2	11-16-94	9.6	1.8	<0.5	2.1	<0.5	<0.5	--	--	--	--
MW-2	03-20-95	Not analyzed: sampling for additional parameters was discontinued									
MW-3	03-18-92	2.7	ND	ND	ND	ND	ND	--	--	--	--
MW-3	06-12-92	1.9	ND	ND	ND	ND	ND	--	--	--	--
MW-3	09-14-92	2	ND	ND	ND	ND	ND	--	--	--	--
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									

Table 4
Historical Groundwater Analytical Data
Volatile and Semivolatile Organic Compounds

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date. 12-12-95

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 5030/601						Semivolatile Organic Compounds by EPA Method 3510/8270			
		Tetrachloro-ethene	Trichloro-ethene	Chloroform	cis-1,2-Dichloro-ethene	Vinyl Chloride	1,1-Dichloro-ethane	Naphthalene	2-Methyl-naphthalene	Bis (2ethylhexyl) 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-4	11-12-92	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--
MW-4	09-30-93	1.6	ND	ND	ND	ND	ND	--	--	--	--
MW-4	11-16-93	1.9	ND	ND	ND	ND	ND	--	--	--	--
MW-4	02-02-94	1.4	ND	ND	ND	ND	ND	--	--	--	--
MW-4	04-29-94	1.9	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-4	08-02-94	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-4	11-16-94	1.8	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-4	03-20-95	Not analyzed: sampling for additional parameters was discontinued									
MW-5	11-12-92	--	--	--	--	--	--	--	--	--	--
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	--	--	--	--
MW-5	09-30-93	17	2.8	ND	2.9	0.8	ND	--	--	--	--
MW-5	11-16-93	19	5.1	ND	4	ND	ND	--	--	--	--
MW-5	02-02-94	2.7	ND	ND	ND	ND	ND	--	--	--	--
MW-5	04-29-94	10	2.7	<0.5	2.4	<0.5	<0.5	--	--	--	--
MW-5	08-02-94	13	5.4	<0.5	5.7	<0.5	<0.5	--	--	--	--
MW-5	11-16-94	1.1	1	<0.5	3.5	1.3	<0.5	--	--	--	--
MW-5	03-20-95	Not analyzed: sampling for additional parameters was discontinued									
MW-6	11-12-92	--	--	--	--	--	--	--	--	--	--
MW-6	01-22-93	120	6.2	6.6	1.8	ND	ND	--	--	--	--
MW-6	04-14-93	120	5.8	ND	1.1	ND	6.3	--	--	--	--
MW-6	09-30-93	220	5.2	ND	2.7	ND	ND	--	--	--	--
MW-6	11-16-93	160	8.5	15	3.2	ND	ND	--	--	--	--
MW-6	02-02-94	100	ND	6.7	ND	ND	ND	--	--	--	--
MW-6	04-29-94	95	6.6	7.2	<2.5	<2.5	<2.5	--	--	--	--
MW-6	08-02-94	87	6.1	4.6	<2.5	<2.5	<2.5	--	--	--	--
MW-6	11-16-94	86	6.8	8.9	<2.5	<2.5	<2.5	--	--	--	--
MW-6	03-20-95	Not analyzed: sampling for additional parameters was discontinued									

Table 4
Historical Groundwater Analytical Data
Volatile and Semivolatile Organic Compounds

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-12-95

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 5030/601						Semivolatile Organic Compounds by EPA Method 3510/8270			
		Tetrachloro-ethene	Trichloro-ethene	Chloroform	cis-1,2-Dichloro-ethene	Vinyl Chloride	1,1-Dichloro-ethane	Naphthalene	2-Methyl-naphthalene	Bis (2ethylhexyl) 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	--	--	--	--	--	--	--	--	--	--
MW-7	01-22-93	6.8	ND	ND	ND	ND	ND	--	--	--	--
MW-7	04-14-93	4.3	ND	ND	ND	ND	ND	--	--	--	--
MW-7	09-30-93	2.5	ND	ND	ND	ND	ND	--	--	--	--
MW-7	11-16-93	4	ND	ND	ND	ND	ND	--	--	--	--
MW-7	02-02-94	3.4	ND	0.8	ND	ND	ND	--	--	--	--
MW-7	04-29-94	3 4	<0.5	1.1	<0.5	<0.5	<0.5	--	--	--	--
MW-7	08-02-94	3.3	<0.5	0.8	<0.5	<0.5	<0.5	--	--	--	--
MW-7	11-16-94	3.3	<0.5	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-7	03-20-95	Not analyzed. sampling for additional parameters was discontinued									
AS-1	09-30-93	29	1.5	1	ND	ND	ND	--	--	--	--
AS-2	08-11-95	Not analyzed. sampling for additional parameters was not initiated									
AS-3	08-11-95	Not analyzed: sampling for additional parameters was not initiated									
AS-4	08-11-95	Not analyzed: sampling for additional parameters was not initiated									
AS-5	08-11-95	Not analyzed: sampling for additional parameters was not initiated									

EPA: United Statest Environmental Protection Agency
µg/L: micrograms per liter
ND: not detected
-- : not analyzed
*: sample was analyzed for volatile organic compounds using USEPA Method 624 (only BTEX was detected)

Table 5
Historical Groundwater Analytical Data
Metals

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 12-12-95

Well Designation	Water Sample FieldDate	Cadmium EPA 6010 µg/L	Chromium EPA 6010 µg/L	Lead EPA 7421 µg/L	Zinc EPA 6010 µg/L	Nickel EPA 6010 µg/L
MW-1	03-18-92	<3	5	3	31	<20
MW-1	06-12-92	--	--	--	--	--
MW-1	09-14-92	--	--	--	--	--
MW-1	10-07-92	--	--	--	--	--
MW-1	01-22-93	--	--	--	--	--
MW-1	04-14-93	<3	<5	3	25	<20
MW-1	09-30-93	Not analyzed: sampling for additional parameters was discontinued				
MW-2	03-18-92	<3	21	9	54	38
MW-2	06-12-92	Not analyzed: sampling for additional parameters was discontinued				
MW-3	03-18-92	<3	67	27	156	113
MW-3	06-12-92	--	--	--	--	--
MW-3	09-14-92	--	--	--	--	--
MW-3	10-07-92	Not sampled: well contained floating product				
MW-3	01-22-93	<3	10	8	28	23
MW-3	04-14-93	<3	<5	3	25	<20
MW-3	09-30-93	<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-1	09-30-93	Not analyzed. sampling for additional parameters was not initiated				
AS-2	08-11-95	Not analyzed: sampling for additional parameters was not initiated				
AS-3	08-11-95	Not analyzed: sampling for additional parameters was not initiated				
AS-4	08-11-95	Not analyzed: sampling for additional parameters was not initiated				
AS-5	08-11-95	Not analyzed. sampling for additional parameters was not initiated				

EPA. United Statest Environmental Protection Agency
µg/L: micrograms per liter
- - : not analyzed

Table 6
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 6148	Vapor Treatment Unit: ThermTech Model CATVAC-10E electric/ catalytic oxidizer
Location: 5131 Shattuck Avenue, Oakland, California	
Consultant: EMCON, 1921 Ringwood Avenue, San Jose, California	Start-Up Date: 09-27-95
	Reporting Period From: 09-01-95
	To: 01-01-96

Date Begin:		09-01-95	10-01-95
Date End:		10-01-95	01-01-96
Mode of Oxidation:		Cat-ox	Cat-ox
Days of Operation:		3.12	10.64
Days of Downtime:		26.88	81.36
Average Vapor Concentrations (1)			
Well Field Influent:	ppmv (2) as gasoline	3800	1200
	mg/m3 (3) as gasoline	14000	4400
	ppmv as benzene	81	19
	mg/m3 as benzene	260	61
System Influent:	ppmv as gasoline	1800	600
	mg/m3 as gasoline	6700	2200
	ppmv as benzene	41	11
	mg/m3 as benzene	130	34
System Effluent:	ppmv as gasoline	52	30
	mg/m3 as gasoline	190	110
	ppmv as benzene	1.1	0.5
	mg/m3 as benzene	3.5	1.5
Average Well Field Flow Rate (4), scfm (5):		75.0	104.0
Average System Influent Flow Rate (4), scfm:		103.6	132.3
Average Destruction Efficiency (6), percent (7):		97.2	95.0
Average Emission Rates (8), pounds per day (9)			
Gasoline:		1.77	1.31
Benzene:		0.03	0.02
Operating Hours This Period:		74.9	255.3
Operating Hours To Date:		74.9	330.2
Pounds/ Hour Removal Rate, as gasoline (10):		3.93	1.71
Pounds Removed This Period, as gasoline (11):		294.4	437.3
Pounds Removed To Date, as gasoline:		294.4	731.7
Gallons Removed This Period, as gasoline (12):		47.5	70.5
Gallons Removed To Date, as gasoline:		47.5	118.0

Table 6
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 6148	Vapor Treatment Unit: ThermTech Model
Location: 5131 Shattuck Avenue	CATVAC-10E electric/
Oakland, California	catalytic oxidizer
Consultant: EMCON	Start-Up Date: 09-27-95
1921 Ringwood Avenue	Reporting Period From: 09-01-95
San Jose, California	To: 01-01-96

CURRENT REPORTING PERIOD:	09-01-95	to 01-01-96
DAYS / HOURS IN PERIOD:	122.00	2928.00
DAYS / HOURS OF OPERATION:	13.76	330.24
DAYS / HOURS OF DOWN TIME:	108.24	2597.76
PERCENT OPERATIONAL:		11.3 %
PERIOD POUNDS REMOVED:	731.7	
PERIOD GALLONS REMOVED:	118.0	
AVERAGE WELL FIELD FLOW RATE (scfm):		97.4
AVERAGE SYSTEM INFLUENT FLOW RATE (scfm):		125.8

1. Average concentrations are based on discrete sample results reported during the month; refer to Appendix C for discrete sample results.
2. ppmv: parts per million by volume
3. mg/m3: milligrams per cubic meter
4. Average flow rates (time weighted average) are based on instantaneous flow rates recorded during the month; refer to Appendix C for instantaneous flow data
5. scfm: flow in standard cubic feet per minute at one atmosphere and 70 degrees Fahrenheit
6. Average destruction efficiencies are calculated using monthly average concentrations; refer to Appendix C for instantaneous destruction efficiency data.
7. destruction efficiency, percent = ([system influent concentration (as gasoline in mg/m3) - system effluent concentration (as gasoline in mg/m3)] / system influent concentration (as gasoline in mg/m3)) x 100 percent
8. Average emission rates are calculated using monthly average concentrations and flow rates; refer to Appendix C for instantaneous emission rate data.
9. emission rates (pounds per day) = system effluent concentration (as gasoline or benzene in mg/m3) x system influent flow rate (scfm) x 0.02832 m3/ft3 x 1440 minutes/day x 1 pound/454,000 mg
10. pounds/ hour removal rate (as gasoline) = well field influent concentration (as gasoline in mg/m3) x well field influent flow rate (scfm) x 0.02832 m3/ft3 x 60 minutes/hour x 1 pound/454,000 mg
11. pounds removed this period (as gasoline) = pounds/ hour removal rate x hours of operation
12. gallons removed this period (as gasoline) = pounds removed this period (as gasoline) x 0.1613 gallons/pound of gasoline

Table 7
Soil-Vapor Extraction Well Data

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 02-29-96

Date	Well Identification											
	VW-1			VW-2			VW-3			VW-4		
	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O
09-27-95	open	NA	7.0	open	NA	7.5	open	NA	7.0	open	NA	7.0
09-27-95	open	NA	14.0	open	NA	13.0	open	NA	13.0	open	NA	13.0
09-27-95	open	NA	18.0	open	NA	18.0	open	NA	17.0	open	NA	17.0
09-27-95	open	538 PID	19.0	open	767 PID	19.5	open	531 PID	19.0	open	627 PID	19.5
09-27-95	open	NA	NA	open	4100 LAB	NA	open	1700 LAB	NA	open	3600 LAB	NA
09-28-95	open	1006 PID	18.0	open	NA	18.0	open	NA	18.0	open	NA	18.5
09-28-95	open	2800 LAB	NA	open	NA	NA	open	NA	NA	open	NA	NA
09-29-95	open	NA	20.0	open	NA	20.0	open	NA	20.0	open	NA	20.0
10-11-95	open	NA	18.0	open	NA	18.0	open	NA	18.0	open	NA	18.0
01-12-96	open	300 PID	25.0	open	500 PID	25.0	open	430 PID	25.0	open	580 PID	25.0

TVHG: concentration of total volatile hydrocarbons as gasoline
ppmv: parts per million by volume
in-H2O: inches of water
open: open to the system
passive: open to the atmosphere
closed: closed to the system and atmosphere
NA: not analyzed or not measured
FID: TVHG concentration was measured with a portable flame ionization detector
LAB: TVHG concentration was analyzed in the laboratory
PID: TVHG concentration was measured with a portable photoionization detector

Table 7
Soil-Vapor Extraction Well Data

ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 02-29-96

Date	Well Identification											
	VW-5			VW-6			VW-7			VW-8		
	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O
09-27-95	open	NA	6.5	open	NA	6.0	open	NA	6.0	open	NA	6 0
09-27-95	open	NA	13.0	open	NA	13.0	open	NA	13.0	open	NA	13.0
09-27-95	open	NA	17.0	open	NA	17.0	open	NA	17.0	open	NA	17.0
09-27-95	open	247 PID	18.0	open	2615 PID	19.0	open	856 PID	19.0	open	501 PID	18.5
09-27-95	open	550 LAB	NA	open	4700 LAB	NA	open	2800 LAB	NA	open	1100 LAB	NA
09-28-95	open	NA	18 0	open	NA	18.0	open	NA	17.5	open	NA	17 0
09-28-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
09-29-95	closed	NA	NA	open	NA	19.0	open	NA	19.5	open	NA	19.0
10-11-95	closed	NA	NA	open	NA	17.5	open	NA	17.0	open	NA	17.0
01-12-96	open	350 PID	25.0	open	2210 PID	25.0	open	300 PID	22.0	open	225 PID	25.0

TVHG: concentration of total volatile hydrocarbons as gasoline
ppmv: parts per million by volume
in-H2O: inches of water
open: open to the system
passive: open to the atmosphere
closed: closed to the system and atmosphere
NA: not analyzed or not measured
FID: TVHG concentration was measured with a portable flame ionization detector
LAB: TVHG concentration was analyzed in the laboratory
PID: TVHG concentration was measured with a portable photoionization detector

Table 7
Soil-Vapor Extraction Well Data

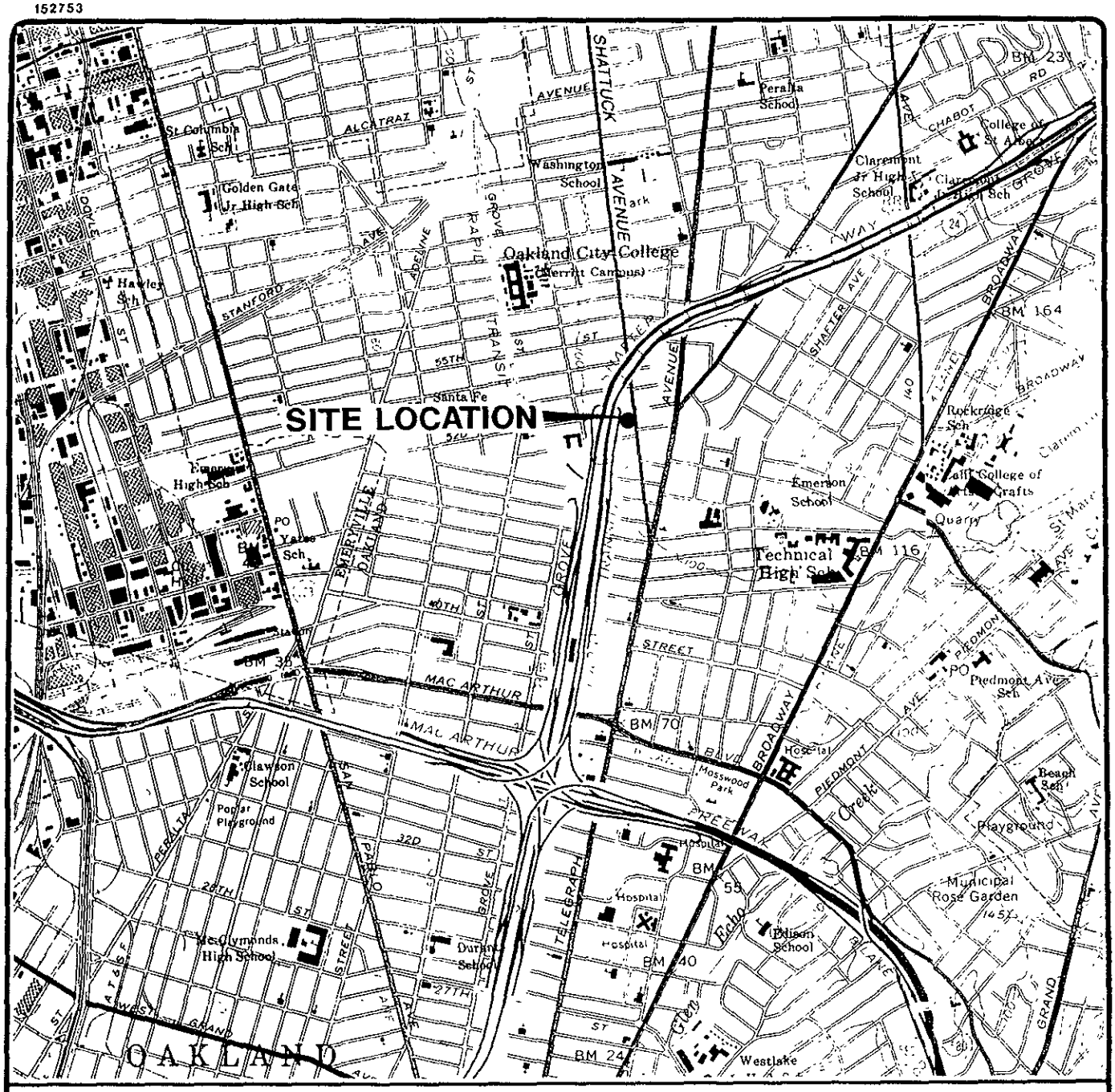
ARCO Service Station 6148
5131 Shattuck Avenue, Oakland, California

Date: 02-29-96

Date	Well Identification											
	VW-9			VW-10			MW-1			MW-5		
	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O
09-27-95	open	NA	7.5	open	NA	6.0	open	NA	7.5	open	NA	5.0
09-27-95	open	NA	13.0	open	NA	13.0	open	NA	14.0	open	NA	12 0
09-27-95	open	NA	17.0	open	NA	17.0	open	NA	17.0	open	NA	17.0
09-27-95	open	801 PID	19.0	open	482 PID	19 0	open	438 PID	5.0	open	457 PID	18.5
09-27-95	open	6300 LAB	NA	open	1700 LAB	NA	open	1600 LAB	NA	open	960 LAB	NA
09-28-95	open	NA	18.0	open	NA	18.0	open	NA	5.0	open	NA	17.0
09-28-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
09-29-95	open	NA	19.0	open	NA	19.5	open	NA	5.0	open	NA	19.0
10-11-95	open	NA	17.5	open	NA	17.5	open	NA	4 0	open	NA	16.5
01-12-96	open	'930 PID	22.0	open	170 PID	5.0	closed	13 PID	0.0	open	172 PID	5.0

TVHG: concentration of total volatile hydrocarbons as gasoline
ppmv: parts per million by volume
in-H2O: inches of water
open: open to the system
passive: open to the atmosphere
closed: closed to the system and atmosphere
NA: not analyzed or not measured
FID: TVHG concentration was measured with a portable flame ionization detector
LAB: TVHG concentration was analyzed in the laboratory
PID: TVHG concentration was measured with a portable photoionization detector

152753



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

- N -

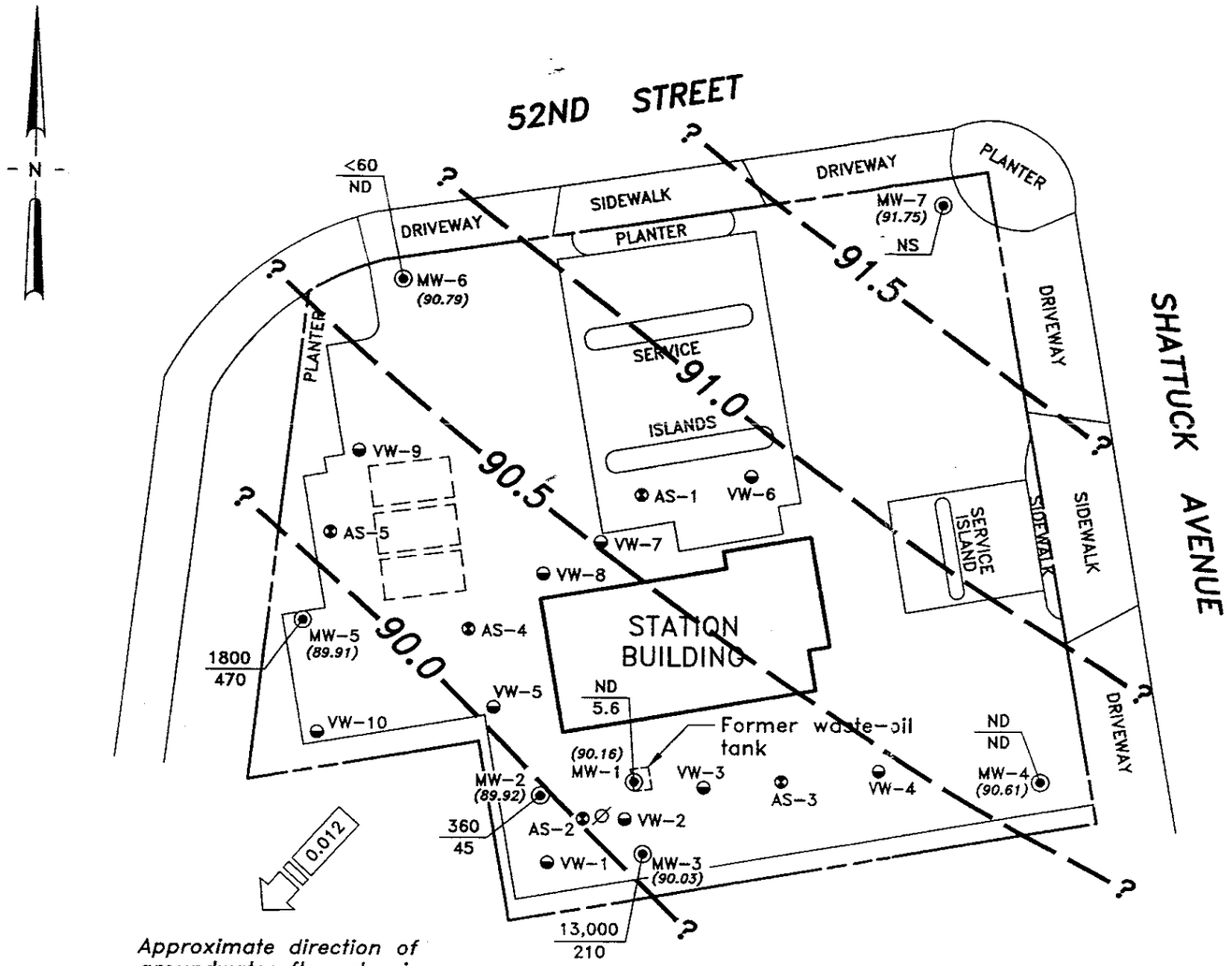
Scale : 0 2000 4000 Feet

EMCON

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

SITE LOCATION

FIGURE
1
PROJECT NO.
805-135.03



Approximate direction of groundwater flow showing gradient (calculated using MW-3, MW-5, and MW-7)

EXPLANATION

- Groundwater monitoring well
- Vapor extraction well
- Air-sparge well
- Ø Decommissioned well
- Existing underground gasoline storage tank
- (90.61) Groundwater elevation (Ft.-MSL) measured 11/16/95
- ? Groundwater elevation contour (Ft.-MSL)
- 360 / 45 TPHG concentration in groundwater (ug/L); sampled 11/16/95; Benzene concentration in groundwater (ug/L); sampled 11/16/95
- NS Not sampled; not scheduled for chemical analysis
- ND Not detected at or above the method reporting limit for TPHG (50 ug/L) or benzene (0.5 ug/L)

EMCON

SCALE: 0 30 60 FEET
(Approximate)

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

GROUNDWATER DATA
FOURTH QUARTER 1995

FIGURE NO.
2
PROJECT NO.
805-135.03

APPENDIX A

FIELD DATA SHEETS, FOURTH QUARTER 1995 GROUNDWATER MONITORING EVENT

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 1775-250.01 STATION ADDRESS : 5131 Shattuck Avenue DATE : 11-16-96

ARCO STATION # : 6148 FIELD TECHNICIAN : S William DAY : THURS

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	**MW-6**	OK	YES	OK	ARCO	OK	14.34	14.36	ND	ND	26.6	
2	**MW-7**	OK	YES	OK	ARCO	OK	15.30	15.30	ND	ND	27.0	
3	**MW-4**	OK	YES	OK	ARCO	OK	16.10	16.10	ND	ND	26.1	
4	**MW-1**	OK	YES	OK	ARCO	OK	17.64	17.64	ND	ND	25.5	
5	**MW-5**	OK	YES	OK	ARCO	OK	16.69	16.69	ND	ND	24.8	
6	**MW-3**	OK	YES	OK	ARCO	OK	17.58	17.58	ND	ND	25.6	
7	**MW-2**	OK	YES	OK	ARCO	OK	17.36	17.36	ND	ND	25.6	

SURVEY POINTS ARE TOP OF WELL CASINGS

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-250-01 SAMPLE ID: MW-1 (25)

PURGED BY: J WILLIAMS CLIENT NAME: ARCO 6148

SAMPLED BY: L LOCATION: OAKLAND CH

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 5.13

DEPTH TO WATER (feet): 17.64 CALCULATED PURGE (gal.): 15.40

DEPTH OF WELL (feet): 25.5 ACTUAL PURGE VOL. (gal.): 15.5

DATE PURGED: 11-16-95 Start (2400 Hr) 1334 End (2400 Hr) 1348

DATE SAMPLED: 11-16-95 Start (2400 Hr) ~ End (2400 Hr) 1352

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1341	5.5	6.62	437	69.9	BROWN	MOD
1344	10.5	6.48	441	71.3	BROWN	MOD
1348	15.5	6.48	453	71.9	CLEAR	TRACE

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

Field QC samples collected at this well: NR

Parameters field filtered at this well: NA

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: OK LOCK #: NONE

REMARKS: ___

Meter Calibration: Date: 11-16-95 Time: ___ Meter Serial #: ___ Temperature °F: ___

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

Location of previous calibration: ___

Signature: [signature] Reviewed By: [signature] Page 1 of 6

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-250-01 | SAMPLE ID: MW-2 (ES)

PURGED BY: S WILLIAMS | CLIENT NAME: ARCO 6148

SAMPLED BY: ↓ | LOCATION: OAKLAND CA

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

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

CASING ELEVATION (feet/MSL): NA | VOLUME IN CASING (gal.): 5.38

DEPTH TO WATER (feet): 13.36 | CALCULATED PURGE (gal.): 16.15

DEPTH OF WELL (feet): 25.6 | ACTUAL PURGE VOL. (gal.): 16.5

DATE PURGED: 11-16-95 | Start (2400 Hr) 1505 | End (2400 Hr) 1517

DATE SAMPLED: 11-16-95 | Start (2400 Hr) — | End (2400 Hr) 1525

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1509	6	6.43	440	69.3	CLEAR	CLEAR
1513	11.5	6.38	432	71.0	BROWN	MOD
1517	16.5	630	435	71.2	BROWN	MOD

D. O. (ppm): NA | ODOR: STRONG | NA (COBALT 0 - 500) | NA (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NA

Parameters field filtered at this well: NA

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 ✓ Bailer (Teflon®)
___ DDL Sampler ___ Bailer (Stainless Steel)
___ Dipper ___ Submersible Pump
___ Well Wizard™ ___ Dedicated
Other: ___

WELL INTEGRITY: OK | LOCK #: NONE

REMARKS: ___

Meter Calibration: Date: 11-16-95 Time: ___ Meter Serial #: ___ Temperature °F: ___

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

Location of previous calibration: ___

Signature: [signature] Reviewed By: SH Page 2 of 6

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-250-01 SAMPLE ID: MW-3 (25)

PURGED BY: J. WILLIAMS CLIENT NAME: ARCO #144

SAMPLED BY: J LOCATION: OAKLAND CA

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 5.23

DEPTH TO WATER (feet): 17.58 CALCULATED PURGE (gal.): 15.71

DEPTH OF WELL (feet): 25.6 ACTUAL PURGE VOL. (gal.): 8

DATE PURGED: 11-16-95 Start (2400 Hr) 1436 End (2400 Hr) 1440

DATE SAMPLED: 11-16-95 Start (2400 Hr) — End (2400 Hr) 1448

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1439	5.5	6.50	477	69.3	CLEAR	TRACE
	DRIED	8 GALLONS	1440			
1442	recharge	~~R~~ 654	567	69.0	CLEAR	CLEAR

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

Field QC samples collected at this well: NR

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: OK LOCK #: NONE

REMARKS: ___

Meter Calibration: Date: ___ Time: ___ Meter Serial #: ___ Temperature °F: ___

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

Location of previous calibration: ___

Signature: [signature] Reviewed By: [signature] Page 3 of 6

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-250-01 SAMPLE ID: MW-4 (26)

PURGED BY: J WILLIAMS CLIENT NAME: ARCO 6148

SAMPLED BY: J LOCATION: OAKLAND CA

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

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

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

DEPTH TO WATER (feet): 16.10 CALCULATED PURGE (gal.): 19.6

DEPTH OF WELL (feet): 26.1 ACTUAL PURGE VOL. (gal.): 20

DATE PURGED: 11-16-95 Start (2400 Hr) 1309 End (2400 Hr) 1316

DATE SAMPLED: 11-16-95 Start (2400 Hr) ____ End (2400 Hr) 1320

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1314	7	6.23	465	72.7	BROWN	MOD
1315	14	6.34	480	73.2	BROWN	MOD
1316	20	6.34	475	73.5	BROWN	MOD

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

Field QC samples collected at this well: NR

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: OK LOCK #: NONE

REMARKS: ____

Meter Calibration: Date: 11-16-95 Time: 1240 Meter Serial #: ____ Temperature °F: ____

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

Location of previous calibration: ____

Signature: [signature] Reviewed By: [signature] Page 4 of 6

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-250-01 SAMPLE ID: MW-5- (24)

PURGED BY: J. GUILLIAMS CLIENT NAME: ARCO 6194

SAMPLED BY: J LOCATION: OAKLAND CA

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

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

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	5.29
DEPTH TO WATER (feet):	16.69	CALCULATED PURGE (gal.):	15.89
DEPTH OF WELL (feet):	24.8	ACTUAL PURGE VOL. (gal.):	13

DATE PURGED: 11-16-95 Start (2400 Hr) 1407 End (2400 Hr) 1419

DATE SAMPLED: 11-16-95 Start (2400 Hr) ___ End (2400 Hr) 1425

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1412	5.5	6.65	467	69.3	CLEAR	TRACE
1415	11	6.53	475	69.8	BROWN	HEAVY
	DRIED 13 GALLONS 1419					
1429	recharge	6.78	490	68.9	BROWN	HEAVY

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

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		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: OK LOCK #: NONE

REMARKS: ___

Meter Calibration: Date: 11-16-95 Time: ___ Meter Serial #: ___ Temperature °F: ___

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

Location of previous calibration: ___

Signature: [signature] Reviewed By: SP Page 5 of 6

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-250.01 SAMPLE ID: MW-6 (EG)

PURGED BY: J WILLIAMS CLIENT NAME: ARCO 6148

SAMPLED BY: J WILLIAMS LOCATION: OAKTOWN CA

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

CASING DIAMETER (inches): 2 ___ 3 ___ 4 ✓ 1.76 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 8.00

DEPTH TO WATER (feet): 14.34 CALCULATED PURGE (gal.): 24.0#

DEPTH OF WELL (feet): 26.6 ACTUAL PURGE VOL. (gal.): 26.5

DATE PURGED: 11-16-95 Start (2400 Hr) 1245 End (2400 Hr) 1252

DATE SAMPLED: 11-16-95 Start (2400 Hr) — End (2400 Hr) 1255

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1249	8.5	6.61	420	71.5	BROWN	HEAVY
1250	16.5	6.54	417	71.5	BROWN	HEAVY
1252	24.5	6.50	417	70.9	BROWN	HEAVY

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

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

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

Field QC samples collected at this well: MS

Parameters field filtered at this well: NR

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 ✓ Bailer (Teflon®)

___ DDL Sampler ___ Bailer (Stainless Steel)

___ Dipper ___ Submersible Pump

___ Well Wizard™ ___ Dedicated

Other: ___

WELL INTEGRITY: OK LOCK #: ARCO

REMARKS: ___

Meter Calibration: Date: 11-16-96 Time: 1240 Meter Serial #: ___ Temperature °F: 73.4

(EC 1000 963 / 1000) (DI ___) (pH 7 7.01 / 7.00) (pH 10 9.97 / 10.00) (pH 4 4.00 / —)

Location of previous calibration: ___

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

APPENDIX B

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

Columbia Analytical Services Inc.

December 7, 1995

Service Request No: S9501466

John Young
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

Re: **0805-135.03 / TO# 17075.00 / 6148 Oakland**

Dear Mr. Young:

The following pages contain analytical results for sample(s) received by the laboratory on Novmeber 20, 1995. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above - to help expedite our service please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 11, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely:

Steven L. Green
Project Chemist

Annelise J. Bazar
Regional QA Coordinator

SLG/ajb

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

COLUMBIA ANALYTICAL SERVICES, Inc.
Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
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
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. 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
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
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 method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9501466
Project:	0805-135.03 / TO# 17075.00 / 6148 Oakland	**Date Collected:**	11/16/95
Sample Matrix:	Water	**Date Received:**	11/20/95
		Date Extracted:	NA

BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name:	**MW-6 (26)**	**MW-4 (26)**	**MW-1 (25)**
Lab Code:	S9501466-001	S9501466-002	S9501466-003
Date Analyzed:	11/30/95	11/30/95	11/30/95

Analyte	**MRL**			
TPH as Gasoline	50	<60 *	ND	ND
Benzene	0.5	ND	ND	5.6
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	1.4
Total Xylenes	0.5	ND	ND	1.2
Methyl-tert-butyl ether	3	NAN	6	55

* Raised MRL due to matrix interference.

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 0805-135.03 / TO# 17075.00 / 6148 Oakland
Sample Matrix: Water

Service Request: S9501466
Date Collected: 11/16/95
Date Received: 11/20/95
Date Extracted: NA

BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ug/L (ppb)

	Sample Name:	**MW-5 (24)**	**MW-3 (25)**	**MW-2 (25)**
	Lab Code:	S9501466-004	S9501466-005	S9501466-006
	Date Analyzed:	11/30/95	11/30/95	11/30/95
Analyte	**MRL**			
TPH as Gasoline	50	1,800	13,000	360
Benzene	0.5	470	210	45
Toluene	0.5	<5 *	<20 *	1.3
Ethylbenzene	0.5	17	320	7.1
Total Xylenes	0.5	5	1,000	7.5
Methyl-tert-butyl ether	3	1,000	790	210

* Raised MRL due to high analyte concentration requiring sample dilution.

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9501466
Project:	0805-135.03 / TO# 17075.00 / 6148 Oakland	**Date Collected:**	11/16/95
Sample Matrix:	Water	**Date Received:**	11/20/95
		Date Extracted:	NA

BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name:	**Method Blank**	**Method Blank**
Lab Code:	S951129-WB	S951130-WB
Date Analyzed:	11/29/95	11/30/95

Analyte	**MRL**		
TPH as Gasoline	50	ND	ND
Benzene	0.5	ND	ND
Toluene	0.5	ND	ND
Ethylbenzene	0.5	ND	ND
Total Xylenes	0.5	ND	ND
Methyl-tert-butyl ether	3	ND	ND

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	L9504103
Project:	ARCO Products Company #6148/#0805-135.03	**Date Collected:**	11/16/95
Sample Matrix:	Water	**Date Received:**	11/20/95
		Date Extracted:	11/21/95
		Date Analyzed:	11/21/95

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

Sample Name	Lab Code	MRL	Result
MW-3 (25)	L9504103-005	0.5	8.3
Method Blank	L9504103-MB	0.5	ND

1AMRL/120594

APPENDIX A

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 0805-135.03 / TO# 17075.00 / 6148 Oakland
Sample Matrix: Water

Service Request: S9501466
Date Collected: 11/16/95
Date Received: 11/20/95
Date Extracted: NA
Date Analyzed: 11/29,30/95

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

Sample Name	Lab Code	PID Detector Percent Recovery 4-Bromofluorobenzene	FID Detector Percent Recovery α,α,α–Trifluorotoluene
MW-6 (26)	S9501466-001	88	98
MW-4 (26)	S9501466-002	96	100
MW-1 (25)	S9501466-003	93	102
MW-5 (24)	S9501466-004	93	100
MW-3 (25)	S9501466-005	92	106
MW-2 (25)	S9501466-006	89	109
MS	S9501464-001MS	89	106
DMS	S9501464-001DMS	89	103
Method Blank	S951129-WB	88	96
Method Blank	S951130-WB	93	97
CAS Acceptance Limits:		69-116	69-116

SUR2/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 0805-135.03 / TO# 17075.00 / 6148 Oakland

Service Request: S9501466
Date Analyzed: 11/29/95

Initial Calibration Verification (ICV) Summary
BTEX, MTBE 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	22.6	90	85-115
Toluene	25	21.9	88	85-115
Ethylbenzene	25	21.5	86	85-115
Xylenes, Total	75	65.5	87	85-115
Gasoline	250	243	97	90-110
Methyl-tert-butyl Ether *	50	53	106	85-115

* ICV for Methyl-tert-butyl Ether was analyzed on 11/30/95.

ICV25AL/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9501466
Project:	0805-135.03 / TO# 17075.00 / 6148 Oakland	**Date Collected:**	11/16/95
Sample Matrix:	Water	**Date Received:**	11/20/95
		Date Extracted:	NA
		Date Analyzed:	11/29,30/95

Matrix Spike/Duplicate Matrix Spike Summary
TPH as Gasoline
EPA Methods 5030/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name: Batch QC
Lab Code: S9501464-001

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Gasoline	250	250	ND	240	240	96	96	67-121	<1

DMS1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	L9504103
Project:	ARCO Products Company #6148/#0805-135.03	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	11/21/95

Laboratory Control Sample/Duplicate Laboratory Control Sample Summary*
Total Recoverable Petroleum Hydrocarbons (TRPH)
EPA Method 418.1
Units: mg/L (ppm)

	True Value		Result		Percent Recovery			
Analyte	LCS	DLCS	LCS	DLCS	LCS	DLCS	CAS Acceptance Limits	**Relative Percent Difference**
TRPH	2.02	2.02	1.93	1.93	96	96	75-125	<1

* 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.

DLCS/032395

ARCO Products Company
Division of AtlanticRichfieldCompany

Chain of Custody

Task Order No. 1705.00

ARCO Facility no. 6148	City (Facility) Oakland	Project manager (Consultant) John Young	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 453-7300	Fax no. (Consultant) (408) 453-0457
Consultant name EMCON	Address (Consultant) 1921 Ringwood Ave. San Jose, CA 95131		Contract number

Method of shipment: Sampler will deliver

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 8020/EPA 8020	BTEX/TPH Gas Modified 8015 (with MTBE)	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM5520E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	BTEX / TPH Gas (EPA 8020)	Chlorides
MW-6(26)	1	2		X		X	HCL	11/16/95	12:55												X	
MW-4(26)	2	2		X		X	HCL	11/16/95	13:20		X											
MW-1(25)	3	2		X		X	HCL	11/16/95	13:52		X											
MW-5(24)	4	2		X		X	HCL	11/16/95	14:25		X											
MW-3(25)	5	4(2)		X		X	HCL	11/16/95	14:48		X			X								
MW-7(25)	6	2		X		X	HCL	11/16/95	15:25		X											

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: CAS - 135, 03
All Wells 2 40ml HCL VOAs
MW-3 add 2 HCL liter glass

Lab number: 9504103 5950146

Turnaround time
- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☒

Condition of sample:

Temperature received:

	Date	Time			
Relinquished by sampler: Tim Porter	11/20/95	13:15	Received by: Joanne Brown CAS-SJ		
Relinquished by:	Date	Time	Received by:		
Relinquished by: Joanne Brown	Date: 11-20-95	Time: 1700	Received by laboratory:	Date: 11-21-95	Time: 0900

CAS-L: 418.1

Due 12/6

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

APC-3292 (2-91)

APPENDIX C

SVE SYSTEM MONITORING DATA LOG SHEETS

ARCO 6148
SVE SYSTEM
MONITORING DATA

Reporting Period:
09/01/95 00:00
10/01/95 00:00

Hours in Period: 720 00
Days in Period: 30.00

Operation + Down Hours: 720.00
Operation + Down Days: 30.00

	Field Monitoring Data							Laboratory Monitoring Data																	
	Flow Rates		FID or PID Results					Well Field Influent				System Influent				System Effluent									
Reading Date & Time	Well Field Flow Rate	System Influent Flow Rate*	Well Field	System Influent	System Effluent	Destruction Efficiency	Laboratory Sample Time	Gasoline		Benzene		Gasoline		Benzene		Gasoline		Benzene		Destruction Efficiency	Gasoline Emission Rate	Benzene Emission Rate	Period Hours	Meter Hours	Hours of Operation	Days of Operation	Down Hours	Down Days
	scfm	scfm	ppm	ppm	ppm	%		ppmv	mg/m3	ppmv	mg/m3	ppmv	mg/m3	ppmv	mg/m3	ppmv	mg/m3	ppmv	mg/m3	%	lb/day	lb/day						
09/01/95 00:00	0 0	0.0																						4.47				
09/27/95 11:00	0 0	0.0																					635 00	4.47	0.00	0.00	635.0	26.46
09/27/95 13:45	0.0	97.6																					2 75	5.70	1.23	0.05	1.52	0 06
09/27/95 14:16	61.5	97.6																					0.52	6.21	0.51	0.02	0.01	0.00
09/27/95 14:39	103.0	142.6																					0.38	6 59	0.38	0.02	0.00	0.00
09/27/95 16:30	96.9	142.6	1183	780	37.1	95 2	16:30	3800	14000	81	260	1800	6700	41	130	52	190	1 1	3.5	97.2	2.43	0.04	1 85	8 32	1 73	0.07	0.12	0 00
09/28/95 12:18	94.6	142.6	1434			NR																	19 80	28.12	19.80	0 83	0.00	0.00
09/29/95 14:15	0.0	0 0																					25.95	45.70	17.58	0.73	8.37	0.35
09/29/95 14:19	103.7	132.2																					0.07	45.70	0.00	0.00	0.07	0.00
10/01/95 00.00	104.1	132.7																					33.68	79 38	33.68	1.40	0 0	0.00
Period Totals:																							720.00		74.91	3.12	645.09	26 88
Penod Averages.	75.0	103.6	1309	780	37.1			3800	14000	81	260	1800	6700	41	130	52	190	1 1	3.5	97.2	1.77	0.03						

* The total pressure for the system influent flow rate was assumed to be 5.0 inches of water because the data was unavailable.

ARCO 6148
SVE SYSTEM
MONITORING DATA

Reporting Period:
10/01/95 00:00
01/01/96 00:00

Hours in Period: 2208
Days in Period: 92.00

Operation + Down Hours: 2208
Operation + Down Days: 92.00

	Field Monitoring Data							Laboratory Monitoring Data																
	Flow Rates		FID or PID Results					Well Field Influent				System Influent				System Effluent								
Reading Date & Time	Well Field Flow Rate	System Influent Flow Rate*	Well Field	System Influent	System Effluent	Destruction Efficiency	Laboratory Sample Time	Gasoline		Benzene		Gasoline		Benzene		Gasoline		Benzene		Destruction Efficiency	Gasoline Emission Rate	Benzene Emission Rate	Period Hours	Meter Hours	Hours of Operation	Days of Operation	Down Hours	Down Days
	scfm	scfm	ppm	ppm	ppm	%		ppmv	mg/m3	ppmv	mg/m3	ppmv	mg/m3	ppmv	mg/m3	ppmv	mg/m3	ppmv	mg/m3	%	lb/day	lb/day						
10/01/95 00:00																								79.38				
10/11/95 13:53	104.1	132.7																					253.88	333.02	253.64	10.57	0.2	0.01
10/11/95 14:21	0.0	0.0					14:11	1200	4400	19	61	600	2200	11	34	30	110	0.5	1.5	95.0	0.00	0.00	0.47	333.49	0.47	0.02	0.00	0.00
01/01/96 00:00	129.2	115.3																					1,954	334.71	1.22	0.05	1952.4	81.35
Period Totals.																							2208		255.33	10.64	1952.7	81.36
Period Averages:	104.0	132.3						1200	4400	19	61	600	2200	11	34	30	110	0.5	1.5	95.0	1.31	0.02						

* The total pressure for the system influent flow rate was assumed to be 5.0 inches of water because the data was unavailable.

APPENDIX D
OPERATION AND MAINTENANCE FIELD DATA SHEETS, SVE AND AIR SPARGE SYSTEMS, FOURTH QUARTER 1995

Remarks: System on upon arrival - Took I-1 sample for Cx Cox and Cx Tedlr VW-1 sample (the bag deflated - bad seal on bottom of bag) Took readings Changed ATI Phone line

Unscheduled site visit [] Scheduled site visit []

SYSTEM PARAMETERS (Therm Tech Model CATVAC 10E electric catalytic oxidizer) ATI phone # 510-595-9298

Arrival Time (24:00 hour)	11:57	**Effluent (E-1) (12"x12")**	
System Status (on or off)	ON	Stack Temperature (°F)	977
Shutdown Time (24:00 hour)	—	**SYSTEM**	
Restart Time (24:00 hour)	—	Fire Box Temperature (°F)	620
Reading Time (24:00 hour)	12:15	Set Point (°F)	620
Well Field I-1 (3")		**TOTAL HOURS**	28,12
Vacuum (in. of H_2O)	22.5	Electric Meter (kwh)	
Velocity (in. of H_2O)	.255	Dilution Controller Setpoint (°F)	1200
Temperature (°F)	74	**AIR MONITORING**	
After Blower I-2 (4")		**FID (ppm)**	Amb / I-1 / I-2 / E-1
Total Pressure (in. of H_2O)	NA	Date: (WITHOUT CARBON FILTER)	
Total Flow (in. of H_2O)	.214	Date: (WITH CARBON FILTER)	
Temperature (°F)	155	**PID (ppm)**	CALIBRATION GAS TYPE:
Dilution Air (3") Temperature (°F)	NA	Date: 9/28/95	1.0 / 1434
Dilution Air Flow (in of H_2O)	Data on ATI only	Date:	
ATI operating properly: yes/no		**Lab samples taken for analysis at:** VW-1 & I-1	

WELL FIELD

SVE/Bubbler Well ID	Well Diameter	Screen Interval	DTW (feet)	TD (feet)	Valve Position (% open)	Vacuum (in. of H_2O)	Flow (in. of H_2O)	Bubbler Flow (cfm)	DO (mg/l)	PID (ppm)
VW-1	4"	14'-24'			Full ON	18.0	(2") .125			1006
VW-2	4"	10'-24'				18.0	(2") .015			
VW-3	4"	14'-24'				18.0	(2") .01			
VW-4	4"	10'-24'				18.5	(2") .26			
VW-5	4"	10'-24'				18.0	(2") .25	.015		
VW-6	4"	10'-24'				18.0	(2") .02			
VW-7	4"	10'-24'				17.5	(2") .015			
VW-8	4"	10'-24'				17.6	(2") <.01			
VW-9	4"	10'-24'				18.0	(2") <.01			
VW-10	4"	10'-24'			"	18.0	(2") .04			
MW-1	4"	13'-26'			10% ON	5.0	(2") .035			
MW-5	4"	10'-25'			Full ON	17.0	(2") .03			

Sparge/Bubbler Well ID	Well Diameter	Screened Interval	DTW (feet)	TD (feet)	Valve Position (% open)	Pressure (psi)	Air Flow (cfm)	DO (mg/l)	REMARKS
AS-1 (Sparge only)	1"	26'-28'							
AS-2 (Sparge only)	2"	26'-28'							
AS-3 (Sparge only)	2"	26'-28'							
AS-4 (Sparge only)	2"	26'-28'							
AS-5 (Sparge only)	2"	26'-28'							
MW-2 (Bubbler only)	2"	14'-26'							
MW-3 (Bubbler only)	2"	14'-26'							
MW-4 (Bubbler only)	4"	11.5'-26.5'							
MW-6 (Monitor only)	4"	12'-27'			NA	NA	NA		
MW-7 (Monitor only)	4"	12'-27'			NA	NA	NA		

Total Sparge Data | Compressor Hours=

Total Air Sparge Pressure(psi)= | Total Air Sparge Flow Rate(cfm)= | Total Air Sparge Temp(°F)=

Special Instructions:

Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form. Request all TPHG,BTEX, and Benzene results in mg/m³. Report O_2 and CO_2 in % by volume.

Operator: MAdler Date: 9/28/95

Project#20805-135.004

ARCO 6148 Soil Vapor Extraction System

Remarks: Systems off on arrival Total HRS = 45.7 Control Panel - Courtesy. Increased operating set point to 650°F
Shut off VW-

Unscheduled site visit [] Scheduled site visit []

SYSTEM PARAMETERS (Therm Tech Model CATVAC 10E electric catalytic oxidizer) ATI phone # 510-595-9298

Arrival Time (24:00 hour)	14:15	**Effluent (E-1) (12"x12")**	
System Status (on or off)		Stack Temperature (°F)	1012
Shutdown Time (24:00 hour)		**SYSTEM**	
Restart Time (24:00 hour)	14:19	Fire Box Temperature (°F)	650
Reading Time (24:00 hour)	14:55	Set Point (°F)	650
Well Field I-1 (3")		**TOTAL HOURS**	46.06
Vacuum (in. of H_2O)	24	Electric Meter (kwh)	1352
Velocity (in. of H_2O)	.31	Dilution Controller Setpoint (°F)	1200
Temperature (°F)	75	**AIR MONITORING**	
After Blower I-2 (4")		**FID (ppm)**	Amb / I-1 / I-2 / E-1
Total Pressure (in. of H_2O)	NA	Date: (WITHOUT CARBON FILTER)	
Total Flow (in. of H_2O)	.185	Date: (WITH CARBON FILTER)	
Temperature (°F)	160	**PID (ppm)**	CALIBRATION GAS TYPE:
Dilution Air (3") Temperature (°F)	NA	Date:	
Dilution Air Flow (in of H_2O)	Data on ATI only	Date:	
ATI operating properly: yes/no	yes	**Lab samples taken for analysis at:**	

WELL FIELD

SVE/Bubbler Well ID	Well Diameter	Screen Interval	DTW (feet)	TD (feet)	Valve Position (% open)	Vacuum (in. of H_2O)	Flow (in. of H_2O)	Bubbler Flow (cfm)	DO (mg/l)	PID (ppm)
VW-1	4"	14'-24'			Fulton	20	(2") .15			
VW-2	4"	10'-24'				20	(2") .34			
VW-3	4"	14'-24'				20	(2") .01			
VW-4	4"	10'-24'				20	(2") .335			
VW-5	4"	10'-24'			Closed	0	(2") 0			
VW-6	4"	10'-24'			Fulton	19.0	(2") .025			
VW-7	4"	10'-24'				19.5	(2") .01			
VW-8	4"	10'-24'				19.0	(2") <.01			
VW-9	4"	10'-24'				19.0	(2") <.01			
VW-10	4"	10'-24'				19.5	(2") .055			
MW-1	4"	13'-26'			10% ON	5	(2") .46			
MW-5	4"	10'-25'			Fulton	19.0	(2") .04			

Sparge/Bubbler Well ID	Well Diameter	Screened Interval	DTW (feet)	TD (feet)	Valve Position (% open)	Pressure (psi)	Air Flow (cfm)	DO (mg/l)	REMARKS
AS-1 (Sparge only)	1"	26'-28'							
AS-2 (Sparge only)	2"	26'-28'							
AS-3 (Sparge only)	2"	26'-28'							
AS-4 (Sparge only)	2"	26'-28'							
AS-5 (Sparge only)	2"	26'-28'							
MW-2 (Bubbler only)	2"	14'-26'							
MW-3 (Bubbler only)	2"	14'-26'							
MW-4 (Bubbler only)	4"	11.5'-26.5'							
MW-6 (Monitor only)	4"	12'-27'			NA	NA	NA		
MW-7 (Monitor only)	4"	12'-27'			NA	NA	NA		

Total Sparge Data

Total Air Sparge Pressure(psi)=	Total Air Sparge Flow Rate(cfm)=	Compressor Hours= / Total Air Sparge Temp(°F)=

Special Instructions:

Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form. Request all TPHG,BTEX, and Benzene results in mg/m³. Report O_2 and CO_2 in % by volume.

Operator: MAdler Date: 9/29/95

Project#20805-135.004
ARCO 6148 Soil Vapor Extraction System

Remarks: System on upon arrival. Overhead & Outer fence installed I put lock on gate. Bubbler & Sparge not complete Sampled I-1 E-1 I-2 Unit Shut off per ARCO @ 14:21 Total Hrs = 333.49

Unscheduled site visit [] Scheduled site visit [X]

SYSTEM PARAMETERS (Therm Tech Model CATVAC 10E electric catalytic oxidizer) ATI phone # 510-595-9298

Arrival Time (24:00 hour)	13:30	**Effluent (E-1) (12"x12")**	
System Status (on or off)	ON	Stack Temperature (°F)	849
Shutdown Time (24:00 hour)	14:21	**SYSTEM**	
Restart Time (24:00 hour)	—	Fire Box Temperature (°F)	650
Reading Time (24:00 hour)	13:53	Set Point (°F)	650
Well Field I-1 (3")		**TOTAL HOURS**	333.02
Vacuum (in. of H_2O)	22.5	Electric Meter (kwh)	9232
Velocity (in. of H_2O)	.305	Dilution Controller Setpoint (°F)	1200
Temperature (°F)	71	**AIR MONITORING**	
After Blower I-2 (4")		**FID (ppm)**	Amb / I-1 / I-2 / E-1
Total Pressure (in. of H_2O)	NA	Date: (WITHOUT CARBON FILTER)	
Total Flow (in. of H_2O)	.19	Date: (WITH CARBON FILTER)	
Temperature (°F)	165	**PID (ppm)**	CALIBRATION GAS TYPE:
Dilution Air (3") Temperature (°F)	NA	Date:	
Dilution Air Flow (in of H_2O)	Data on ATI only	Date:	
ATI operating properly: yes/no	yes	**Lab samples taken for analysis at:**	E-1 I-2 I-1

WELL FIELD

SVE/Bubbler Well ID	Well Diameter	Screen Interval	DTW (feet)	TD (feet)	Valve Position (% open)	Vacuum (in. of H_2O)	Flow (2") (in. of H_2O)	Bubbler Flow (cfm)	DO (mg/l)	PID (ppm)
VW-1	4"	14'-24'			Open	18	.37	OFF		
VW-2	4"	10'-24'				18	.02			
VW-3	4"	14'-24'				18	<.01			
VW-4	4"	10'-24'				18	.02			
VW-5	4"	10'-24'			Closed	0	0			
VW-6	4"	10'-24'			Open	17.5	.06			
VW-7	4"	10'-24'				17	.15			
VW-8	4"	10'-24'				17	<.01			
VW-9	4"	10'-24'				17.5	.01			
VW-10	4"	10'-24'				17.5	.05			
MW-1	4"	13'-26'			cracked open	4	.28			
MW-5	4"	10'-25'			Open	16.5	.03			

Sparge/Bubbler Well ID	Well Diameter	Screened Interval	DTW (feet)	TD (feet)	Valve Position (% open)	Pressure (psi)	Air Flow (cfm)	DO (mg/l)	REMARKS
AS-1 (Sparge only)	1"	26'-28'							
AS-2 (Sparge only)	2"	26'-28'							
AS-3 (Sparge only)	2"	26'-28'							
AS-4 (Sparge only)	2"	26'-28'							
AS-5 (Sparge only)	2"	26'-28'							
MW-2 (Bubbler only)	2"	14'-26'							
MW-3 (Bubbler only)	2"	14'-26'							
MW-4 (Bubbler only)	4"	11.5'-26.5'							
MW-6 (Monitor only)	4"	12'-27'			NA	NA	NA		
MW-7 (Monitor only)	4"	12'-27'			NA	NA	NA		

Total Sparge Data | Compressor Hours=

Total Air Sparge Pressure(psi)= | Total Air Sparge Flow Rate(cfm)= | Total Air Sparge Temp(°F)=

Special Instructions:

Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form. Request all TPHG,BTEX, and Benzene results in mg/m³. Report O_2 and CO_2 in % by volume.

Operator: MAdler Date: 10/16/95

APPENDIX E
ANALYTICAL RESULTS AND CHAIN OF CUSTODY DOCUMENTATION FOR SVE SYSTEM AIR SAMPLES, FOURTH QUARTER 1995

Columbia
Analytical
Services inc.

September 29, 1995 Service Request No: S951217

Ms. Sailaja Yelamanchili
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

Re: **20805-135.004 / TO# 18344.00 / 6148 Oakland**

Dear Ms. Yelamanchili:

The following pages contain analytical results for sample(s) received by the laboratory on September 28, 1995. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above - to help expedite our service please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 9, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely:

Steven L. Green
Project Chemist

Annelise J. Bazar
Regional QA Coordinator

SLG/ajb

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

COLUMBIA ANALYTICAL SERVICES, Inc.
Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
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
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. 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
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
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 method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 20805-135.004 / TO# 18344.00 / 6148 Oakland
Sample Matrix Vapor

Service Request: S951217
Date Collected: 9/27/95
Date Received: 9/28/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name:	MRL	E-1	I-2	I-1
Lab Code:		S951217-001	S951217-002	S951217-003
Date Analyzed:		9/28/95	9/28/95	9/28/95
Analyte				
Benzene	0.5	3.5	130	260
Toluene	0.5	5.9	280	690
Ethylbenzene	0.5	1.0	57	160
Total Xylenes	1	4	230	720
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20	ND	<200 *	<400 *
C_5 - C_8 Hydrocarbons	20	180	5,900	11,000
C_9 - C_{12} Hydrocarbons	20	ND	810	2,300
Gasoline Fraction (C_5-C_{12})	60	190	6,700	14,000

* Raised MRL due to high analyte concentration requiring a dilution.

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S951217
Project:	20805-135.004 / TO# 18344.00 / 6148 Oakland	**Date Collected:**	9/27/95
Sample Matrix	Vapor	**Date Received:**	9/28/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name:	**Method Blank**
Lab Code:	S950928-VB
Date Analyzed:	9/28/95

Analyte	**MRL**	
Benzene	0.5	ND
Toluene	0.5	ND
Ethylbenzene	0.5	ND
Total Xylenes	1	ND
Total Volatile Hydrocarbons		
C_1 - C_4 Hydrocarbons	20	ND
C_5 - C_8 Hydrocarbons	20	ND
C_9 - C_{12} Hydrocarbons	20	ND
Gasoline Fraction (C_5-C_{12})	60	ND

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 20805-135.004 / TO# 18344.00 / 6148 Oakland
Sample Matrix Vapor

Service Request: S951217
Date Collected: 9/27/95
Date Received: 9/28/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name:	**E-1**	**I-2**	**I-1**
Lab Code:	S951217-001	S951217-002	S951217-003
Date Analyzed:	9/28/95	9/28/95	9/28/95

Analyte	**MRL**			
Benzene	0.1	1.1	41	81
Toluene	0.1	1.6	74	180
Ethylbenzene	0.1	0.2	13	37
Total Xylenes	0.2	0.8	53	170
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	5	ND	<50 *	<100 *
C_5 - C_8 Hydrocarbons	5	50	1,600	3,000
C_9 - C_{12} Hydrocarbons	5	ND	220	630
Gasoline Fraction (C_5-C_{12})	15	52	1,800	3,800

* Raised MRL due to high analyte concentration requiring a dilution.

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S951217
Project:	20805-135.004 / TO# 18344.00 / 6148 Oakland	**Date Collected:**	9/27/95
Sample Matrix	Vapor	**Date Received:**	9/28/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name:	**Method Blank**
Lab Code:	S950928-VB
Date Analyzed:	9/28/95

Analyte	**MRL**	
Benzene	0.1	ND
Toluene	0.1	ND
Ethylbenzene	0.1	ND
Total Xylenes	0.2	ND
Total Volatile Hydrocarbons		
C_1 - C_4 Hydrocarbons	5	ND
C_5 - C_8 Hydrocarbons	5	ND
C_9 - C_{12} Hydrocarbons	5	ND
Gasoline Fraction (C_5-C_{12})	15	ND

3822/060194

APPENDIX A

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S951217
Project:	20805-135.004 / TO# 18344.00 / 6148 Oakland	**Date Collected:**	9/27/95
Sample Matrix	Vapor	**Date Received:**	9/28/95
		Date Extracted:	NA
		Date Analyzed:	9/28/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name: E-1
Lab Code: S951217-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.5	3.5	3.4	3.4	3
Toluene	0.5	5.9	6.0	6.0	2
Ethylbenzene	0.5	1.0	1.0	1.0	<1
Xylenes, Total	1	3.5	3.5	3.5	<1
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	20	ND	ND	ND	<1
C_5 - C_8 Hydrocarbons	20	180	180	180	<1
C_9 - C_{12} Hydrocarbons	20	ND	ND	ND	<1
Gasoline Fraction (C_5-C_{12})	60	190	190	190	<1

DUP1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-135.004 / TO# 18344.00 / 6148 Oakland
Sample Matrix Vapor

Service Request: S951217
Date Collected: 9/27/95
Date Received: 9/28/95
Date Extracted: NA
Date Analyzed: 9/28/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name: E-1
Lab Code: S951217-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.1	1.1	1.1	1.1	<1
Toluene	0.1	1.6	1.6	1.6	<1
Ethylbenzene	0.1	0.2	0.2	0.2	<1
Xylenes, Total	0.2	0.8	0.8	0.8	<1
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	5	ND	ND	ND	<1
C_5 - C_8 Hydrocarbons	5	50	50	50	<1
C_9 - C_{12} Hydrocarbons	5	ND	ND	ND	<1
Gasoline Fraction (C_5-C_{12})	15	52	52	52	<1

DUP1S/060194

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 78344.00

Chain of Custody

ARCO Facility no. 6148	City (Facility) Oakland	Project manager (Consultant) S Yelamanchili	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) 408 377-8697	Telephone no. (Consultant) 408 453 7300	Fax no. (Consultant) 408 453 0452
Consultant name Emcon	Address (Consultant) 1921 Ringwood San Jose, CA.		Contract number 07077

Method of shipment: Tech

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other (Vapor)	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 ☐
E-1		1			X			9/27/95			X									
I-2		1			X			↓			X									
I-1		1			X			↓			X									

Special detection Limit/reporting: please report results in mg/m³ & ppmv

Special QA/QC

Remarks: 20505-135.004 (007)

Lab number: 595-01217

Turnaround time

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

Condition of sample: ok		Temperature received:	
Relinquished by sampler: M Cadle	Date: 9/28/95 Time: 10:00	Received by: RT	
Relinquished by	Date / Time	Received by	
Relinquished by	Date / Time	Received by laboratory	Date / Time

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant
APPC-3292 (2-91)

Due 9/29

Columbia Analytical Services inc.

October 6, 1995

Service Request No: S951218

Ms. Sailaja Yelamanchili
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

Re: **0805-135.004 / TO# 18344.00 / 6148 Oakland**

Dear Ms. Yelamanchili:

The following pages contain analytical results for sample(s) received by the laboratory on September 28, 1995. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above - to help expedite our service please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 15, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely:

Steven L. Green
Project Chemist

Annelise J. Bazar
Regional QA Coordinator

SLG/ajb

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

COLUMBIA ANALYTICAL SERVICES, Inc.
Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
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
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. 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
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
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 method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 0805-135.004 / TO# 18344.00 / 6148 Oakland
Sample Matrix: Vapor

Service Request: S951218
Date Collected: 9/27/95
Date Received: 9/28/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

	Sample Name:	VW-2	VW-3	VW-4
	Lab Code:	S951218-002	S951218-003	S951218-004
	Date Analyzed:	9/29/95	9/29/95	9/29/95
Analyte	**MRL**			
Benzene	0.5	360	130	190
Toluene	0.5	33	15	<10 *
Ethylbenzene	0.5	51	35	24
Total Xylenes	1	58	49	24
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20	<400 *	<200 *	<400 *
C_5 - C_8 Hydrocarbons	20	14,000	5,600	12,000
C_9 - C_{12} Hydrocarbons	20	780	460	620
Gasoline Fraction (C_5-C_{12})	60	15,000	6,000	13,000

* Raised MRL due to high analyte concentration requiring sample dilution.

3522/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 0805-135.004 / TO# 18344.00 / 6148 Oakland
Sample Matrix: Vapor

Service Request: S951218
Date Collected: 9/27/95
Date Received: 9/28/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

	Sample Name:	VW-5	VW-6	VW-7
	Lab Code:	S951218-005	S951218-006	S951218-007
	Date Analyzed:	9/29/95	9/28/95	9/29/95
Analyte	**MRL**			
Benzene	0.5	62	510	120
Toluene	0.5	<3 *	2,100	75
Ethylbenzene	0.5	6	340	76
Total Xylenes	1	5	1,500	270
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20	<100 *	<1,000 *	<400 *
C_5 - C_8 Hydrocarbons	20	1,800	13,000	8,600
C_9 - C_{12} Hydrocarbons	20	160	3,700	1,400
Gasoline Fraction (C_5-C_{12})	60	2,000	17,000	10,000

* Raised MRL due to high analyte concentration requiring sample dilution.

3S22/0o0194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S951218
Project:	0805-135.004 / TO# 18344.00 / 6148 Oakland	**Date Collected:**	9/27/95
Sample Matrix:	Vapor	**Date Received:**	9/28/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name:	**VW-8**	**VW-9**	**VW-10**
Lab Code:	S951218-008	S951218-009	S951218-010
Date Analyzed:	9/28/95	9/29/95	9/28/95

Analyte	**MRL**			
Benzene	0.5	44	87	52
Toluene	0.5	88	60	26
Ethylbenzene	0.5	36	140	23
Total Xylenes	1	160	210	58
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20	<100 *	<1,000 *	<200 *
C_5 - C_8 Hydrocarbons	20	3,200	21,000	5,400
C_9 - C_{12} Hydrocarbons	20	660	2,100	680
Gasoline Fraction (C_5-C_{12})	60	3,900	23,000	6,100

* Raised MRL due to high analyte concentration requiring sample dilution.

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S951218
Project:	0805-135.004 / TO# 18344.00 / 6148 Oakland	**Date Collected:**	9/27/95
Sample Matrix:	Vapor	**Date Received:**	9/28/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name:	**MW-1**	**MW-5**	**Method Blank**
Lab Code:	S951218-011	S951218-012	S950928-VB
Date Analyzed:	9/28/95	9/28/95	9/28/95

Analyte	**MRL**			
Benzene	0.5	100	47	ND
Toluene	0.5	11	25	ND
Ethylbenzene	0.5	8	24	ND
Total Xylenes	1	13	66	ND
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20	<200 *	<100 *	ND
C_5 - C_8 Hydrocarbons	20	5,600	2,800	ND
C_9 - C_{12} Hydrocarbons	20	200	700	ND
Gasoline Fraction (C_5-C_{12})	60	5,800	3,500	ND

* Raised MRL due to high analyte concentration requiring sample dilution.

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S951218
Project:	0805-135.004 / TO# 18344.00 / 6148 Oakland	**Date Collected:**	9/27/95
Sample Matrix:	Vapor	**Date Received:**	9/28/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name:	**Method Blank**
Lab Code:	S950929-VB
Date Analyzed:	9/29/95

Analyte	**MRL**	
Benzene	0.5	ND
Toluene	0.5	ND
Ethylbenzene	0.5	ND
Total Xylenes	1	ND
Total Volatile Hydrocarbons		
C_1 - C_4 Hydrocarbons	20	ND
C_5 - C_8 Hydrocarbons	20	ND
C_9 - C_{12} Hydrocarbons	20	ND
Gasoline Fraction (C_5-C_{12})	60	ND

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S951218
Project:	0805-135.004 / TO# 18344.00 / 6148 Oakland	**Date Collected:**	9/27/95
Sample Matrix:	Vapor	**Date Received:**	9/28/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

		Sample Name:	**VW-2**	**VW-3**	**VW-4**
		Lab Code:	S951218-002	S951218-003	S951218-004
		Date Analyzed:	9/29/95	9/29/95	9/29/95
Analyte	**MRL**				
Benzene	0.1		110	41	59
Toluene	0.1		9	4	<2 *
Ethylbenzene	0.1		12	8	6
Total Xylenes	0.2		13	11	6
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	5		<100 *	<50 *	<100 *
C_5 - C_8 Hydrocarbons	5		3,800	1,500	3,300
C_9 - C_{12} Hydrocarbons	5		210	130	170
Gasoline Fraction (C_5-C_{12})	15		4,100	1,700	3,600

* Raised MRL due to high analyte concentration requiring sample dilution.

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 0805-135.004 / TO# 18344.00 / 6148 Oakland
Sample Matrix: Vapor

Service Request: S951218
Date Collected: 9/27/95
Date Received: 9/28/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

		Sample Name:	VW-5	VW-6	VW-7
		Lab Code:	S951218-005	S951218-006	S951218-007
		Date Analyzed:	9/29/95	9/28/95	9/29/95
Analyte	**MRL**				
Benzene	0.1		19	160	38
Toluene	0.1		ND	560	20
Ethylbenzene	0.1		1	78	17
Total Xylenes	0.2		1	340	62
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	5		<30 *	<300 *	<100 *
C_5 - C_8 Hydrocarbons	5		500	3,600	2,400
C_9 - C_{12} Hydrocarbons	5		44	1,000	380
Gasoline Fraction (C_5-C_{12})	15		550	4,700	2,800

* Raised MRL due to high analyte concentration requiring sample dilution.

3S22/060191

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 0805-135.004 / TO# 18344.00 / 6148 Oakland
Sample Matrix: Vapor

Service Request: S951218
Date Collected: 9/27/95
Date Received: 9/28/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

		Sample Name:	VW-8	VW-9	VW-10
		Lab Code:	S951218-008	S951218-009	S951218-010
		Date Analyzed:	9/28/95	9/29/95	9/28/95
Analyte	**MRL**				
Benzene	0.1		14	27	16
Toluene	0.1		23	16	7
Ethylbenzene	0.1		8	32	5
Total Xylenes	0.2		37	48	13
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	5		<30 *	<300 *	<50 *
C_5 - C_8 Hydrocarbons	5		880	5,800	1,500
C_9 - C_{12} Hydrocarbons	5		180	580	190
Gasoline Fraction (C_5-C_{12})	15		1,100	6,300	1,700

* Raised MRL due to high analyte concentration requiring sample dilution.

3S22/060191

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 0805-135.004 / TO# 18344.00 / 6148 Oakland
Sample Matrix: Vapor

Service Request: S951218
Date Collected: 9/27/95
Date Received: 9/28/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

	Sample Name:	MW-1	MW-5	Method Blank
	Lab Code:	S951218-011	S951218-012	S950928-VB
	Date Analyzed:	9/28/95	9/28/95	9/28/95
Analyte	**MRL**			
Benzene	0.1	31	15	ND
Toluene	0.1	3	7	ND
Ethylbenzene	0.1	2	6	ND
Total Xylenes	0.2	3	15	ND
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	5	<50 *	<30 *	ND
C_5 - C_8 Hydrocarbons	5	1,500	770	ND
C_9 - C_{12} Hydrocarbons	5	55	190	ND
Gasoline Fraction (C_5-C_{12})	15	1,600	960	ND

* Raised MRL due to high analyte concentration requiring sample dilution.

3S22/0c0191

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S951218
Project:	0805-135.004 / TO# 18344.00 / 6148 Oakland	**Date Collected:**	9/27/95
Sample Matrix:	Vapor	**Date Received:**	9/28/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name:	**Method Blank**
Lab Code:	S950929-VB
Date Analyzed:	9/29/95

Analyte	**MRL**	
Benzene	0.1	ND
Toluene	0.1	ND
Ethylbenzene	0.1	ND
Total Xylenes	0.2	ND
Total Volatile Hydrocarbons		
C_1 - C_4 Hydrocarbons	5	ND
C_5 - C_8 Hydrocarbons	5	ND
C_9 - C_{12} Hydrocarbons	5	ND
Gasoline Fraction (C_5-C_{12})	15	ND

3822/060194

APPENDIX A

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 0805-135.004 / TO# 18344.00 / 6148 Oakland
Sample Matrix: Vapor

Service Request: S951218
Date Collected: 9/27/95
Date Received: 9/28/95
Date Extracted: NA
Date Analyzed: 9/28,29/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name: Batch QC
Lab Code: S951217-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.5	3.5	3.4	3.5	3
Toluene	0.5	5.9	6.0	5.9	2
Ethylbenzene	0.5	1.0	1.0	1.0	<1
Xylenes, Total	1	3.5	3.5	4	<1
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	20	ND	ND	ND	<1
C_5 - C_8 Hydrocarbons	20	180	180	180	<1
C_9 - C_{12} Hydrocarbons	20	15	14	15	7
Gasoline Fraction (C_5-C_{12})	60	190	190	190	<1

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 0805-135.004 / TO# 18344.00 / 6148 Oakland
Sample Matrix: Vapor

Service Request: S951218
Date Collected: 9/27/95
Date Received: 9/28/95
Date Extracted: NA
Date Analyzed: 9/28,29/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name: Batch QC
Lab Code: S951217-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.1	1.1	1.1	1.1	<1
Toluene	0.1	1.6	1.6	1.6	<1
Ethylbenzene	0.1	0.2	0.2	0.2	<1
Xylenes, Total	0.2	0.8	0.8	0.8	<1
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	5	ND	ND	ND	<1
C_5 - C_8 Hydrocarbons	5	50	50	50	<1
C_9 - C_{12} Hydrocarbons	5	4	4	4	<1
Gasoline Fraction (C_5-C_{12})	15	52	52	52	<1

DUP1S/060194

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 18347.00

Chain of Custody

ARCO Facility no. 6148	City (Facility) Oakland	Project manager (Consultant) S. Yelamanchili	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) 408 3778697	Telephone no. (Consultant) 4084537300	Fax no. (Consultant) 408 453 0452
Consultant name EMCON	Address (Consultant) 1921 Kingwood San José, CA		Contract number 07077

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other (Vapor)	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 ☐
VW-1	1	1			X			9/27/95			X					defrated				
VW-2	2	1			X						X									
VW-3	3	1			X						X									
VW-4	4	1			X						X									
VW-5	5	1			X						X									
VW-6	6	1			X						X									
VW-7	7	1			X						X									
VW-8	8	1			X						X									
VW-9	9	1			X						X									
VW-10	10	1			X						X									
MW-1	11	1			X						X									
MW-5	12	1			X						X									

Special detection Limit/reporting: please report results in mg/m³ & ppmv

Special QA/QC

Remarks: 20805-135.004 (007)

Lab number: 595-01218

Turnaround time

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

Method of shipment: Tech

Condition of sample:		Temperature received:	
Relinquished by sampler	Date 9/28/95 Time 10:00	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory	Date Time

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant
APPC-3292 (2-91)

Due 10/12

Columbia
Analytical
Services inc.

October 11, 1995 Service Request No: S951221

Ms. Sailaja Yelamanchili
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

Re: **20805-135.004 / TO# 18344.00 / 6148 Oakland**

Dear Ms. Yelamanchili:

The following pages contain analytical results for sample(s) received by the laboratory on September 29, 1995. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above - to help expedite our service please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 9, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely:

Steven L. Green
Project Chemist

Annelise J. Bazar
Regional QA Coordinator

SLG/ajb

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

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CAS Number	Chemical Abstract Service registry Number
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CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
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
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. 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
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
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 method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S951221
Project:	20805-135.004 / TO# 18344.00 / 6141 Oakland	**Date Collected:**	9/28/95
Sample Matrix:	Vapor	**Date Received:**	9/29/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

		Sample Name:	**VW-1**	**Method Blank**
		Lab Code:	S951221-001	S951223-002
		Date Analyzed:	9/29/95	9/29/95
Analyte	**MRL**			
Benzene	0.5		220	ND
Toluene	0.5		110	ND
Ethylbenzene	0.5		61	ND
Total Xylenes	1		130	ND
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20		<400 *	ND
C_5 - C_8 Hydrocarbons	20		9,500	ND
C_9 - C_{12} Hydrocarbons	20		870	ND
Gasoline Fraction (C_5-C_{12})	60		10,000	ND

* Raised MRL due to high analyte concentration requiring sample dilution.

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S951221
Project:	20805-135.004 / TO# 18344.00 / 6141 Oakland	**Date Collected:**	9/28/95
Sample Matrix:	Vapor	**Date Received:**	9/29/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

		Sample Name:	**VW-1**	**Method Blank**
		Lab Code:	S951221-001	S951223-002
		Date Analyzed:	9/29/95	9/29/95
Analyte	**MRL**			
Benzene	0.1		69	ND
Toluene	0.1		29	ND
Ethylbenzene	0.1		14	ND
Total Xylenes	0.2		30	ND
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	5		<100 *	ND
C_5 - C_8 Hydrocarbons	5		2,600	ND
C_9 - C_{12} Hydrocarbons	5		240	ND
Gasoline Fraction (C_5-C_{12})	15		2,800	ND

* Raised MRL due to high analyte concentration requiring sample dilution.

3S22/060191

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	L953647
Project:	ARCO Products Company #6148/#20805-135.004(007)	**Date Collected:**	9/28/95
Sample Matrix:	Vapor	**Date Received:**	9/29/95
		Date Extracted:	NA

Permanent Gases*
Units: % (v/v)

		Sample Name:	**I-1**	**Method Blank**
		Lab Code:	L9503647-001	L9503647-MB
		Date Analyzed:	10/2/95	10/2/95
Analyte	**MRL**			
Carbon Dioxide	1		9	ND
Oxygen	1		16	ND

* Analysis performed using gas chromatography with a thermal conductivity detector.

3S22/120594

APPENDIX A

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-135.004 / TO# 18344.00 / 6141 Oakland
Sample Matrix: Vapor

Service Request: S951221
Date Collected: 9/28/95
Date Received: 9/29/95
Date Extracted: NA
Date Analyzed: 9/29/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name: Batch QC
Lab Code: S951222-006

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.5	5.9	6.0	6.0	2
Toluene	0.5	17	17	17	<1
Ethylbenzene	0.5	8.5	8.0	8	6
Xylenes, Total	1	68	67	68	1
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	20	<40 *	<40 *	<40 *	<1
C_5 - C_8 Hydrocarbons	20	550	550	550	<1
C_9 - C_{12} Hydrocarbons	20	350	350	350	<1
Gasoline Fraction (C_5-C_{12})	60	920	900	910	2

* Raised MRL due to high analyte concentration requiring sample dilution.

DUP1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-135.004 / TO# 18344.00 / 6141 Oakland
Sample Matrix: Vapor

Service Request: S951221
Date Collected: 9/28/95
Date Received: 9/29/95
Date Extracted: NA
Date Analyzed: 9/29/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name: Batch QC
Lab Code: S951222-006

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.1	2	2	2	<1
Toluene	0.1	5	5	5	<1
Ethylbenzene	0.1	2	2	2	<1
Xylenes, Total	0.2	16	15	15.5	6
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	5	<10 *	<10 *	<10 *	<1
C_5 - C_8 Hydrocarbons	5	150	150	150	<1
C_9 - C_{12} Hydrocarbons	5	96	96	96	<1
Gasoline Fraction (C_5-C_{12})	15	250	250	250	<1

* Raised MRL due to high analyte concentration requiring sample dilution.

DUP1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Products Company #6148/#20805-135.004(007)
Sample Matrix: Vapor

Service Request: L953647
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 10/2/95

Duplicate Summary
Permanent Gases*
% (v/v)

Sample Name: I-1
Lab Code: L9503647-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Carbon Dioxide	1	9.43	9.43	9.43	<1
Oxygen	1	15.8	15.3	15.6	3

* Analysis performed using gas chromatography with a thermal conductivity detector.

DUP1A/120594

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 18344.00

Chain of Custody

ARCO Facility no. 6148	City (Facility) Oakland	Project manager (Consultant) S. Yelamanchili	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) 4083778697	Telephone no. (Consultant) 4084537300	Fax no. (Consultant) 4084530452
Consultant name EMCON	Address (Consultant) 1921 Ringwood San Jose, CA.		Contract number 70677

Method of shipment: Tech

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other (Vapor)	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M8020/8020/8015	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 ☐	CO_2 O_2
I-1		1			X			9/28/95	12:09												X
VW-1		1			X			9/28/95	12:13		X										

Special detection Limit/reporting: please report TPHG & BTEX in ppmv & mg/m^3 & O_2 CO_2 in % by volume

Special QA/QC

Remarks: 20805-135.004 (007)

Lab number: 595-01221

Turnaround time

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

Condition of sample: inflated		Temperature received: RT	
Relinquished by sampler	Date 9/29/95 Time 8:05	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date 9-29-95 Time 1700	Received by laboratory	Date Time

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant
APPC-3292 (2-91)

CAS-L: CO_2/O_2

Due 10/13

Columbia
Analytical
Services INC.

October 25, 1995

Service Request No: S951275

Ms. Valli Voruganti
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

Re: **0805-135.04 / TO# 18334.00 / 6148 Oakland**

Dear Ms. Voruganti:

The following pages contain analytical results for sample(s) received by the laboratory on October 12, 1995. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above - to help expedite our service please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 9, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely:

Steven L. Green
Project Chemist

Annelise J. Bazar
Regional QA Coordinator

SLG/ajb

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

COLUMBIA ANALYTICAL SERVICES, Inc.
Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
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
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. 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
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
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 method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 0805-135.04 / TO# 18334.00 / 6148 Oakland
Sample Matrix: Vapor

Service Request: S951275
Date Collected: 10/11/95
Date Received: 10/12/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

	Sample Name:	E-1	I-2	I-1
	Lab Code:	S951275-001	S951275-002	S951275-003
	Date Analyzed:	10/12/95	10/12/95	10/12/95
Analyte	**MRL**			
Benzene	0.5	1.5	34	61
Toluene	0.5	4.5	120	270
Ethylbenzene	0.5	1.2	26	78
Total Xylenes	1	6	110	370
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20	ND	<100 *	<100 *
C_5 - C_8 Hydrocarbons	20	90	1,800	3,200
C_9 - C_{12} Hydrocarbons	20	ND	390	1,200
Gasoline Fraction (C_5-C_{12})	60	110	2,200	4,400

* Raised MRL due to high analyte concentration requiring sample dilution.

3522/060191

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S951275
Project:	0805-135.04 / TO# 18334.00 / 6148 Oakland	**Date Collected:**	10/11/95
Sample Matrix:	Vapor	**Date Received:**	10/12/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name:	**Method Blank**
Lab Code:	S951012-VB
Date Analyzed:	10/12/95

Analyte	**MRL**	
Benzene	0.5	ND
Toluene	0.5	ND
Ethylbenzene	0.5	ND
Total Xylenes	1	ND
Total Volatile Hydrocarbons		
C_1 - C_4 Hydrocarbons	20	ND
C_5 - C_8 Hydrocarbons	20	ND
C_9 - C_{12} Hydrocarbons	20	ND
Gasoline Fraction (C_5-C_{12})	60	ND

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 0805-135.04 / TO# 18334.00 / 6148 Oakland
Sample Matrix: Vapor

Service Request: S951275
Date Collected: 10/11/95
Date Received: 10/12/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name:	E-1	I-2	I-1
Lab Code:	S951275-001	S951275-002	S951275-003
Date Analyzed:	10/12/95	10/12/95	10/12/95

Analyte	MRL			
Benzene	0.1	0.5	11	19
Toluene	0.1	1.2	32	72
Ethylbenzene	0.1	0.3	6.0	18
Total Xylenes	0.2	1.4	25	85
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	5	ND	<30 *	<30 *
C_5 - C_8 Hydrocarbons	5	24	500	880
C_9 - C_{12} Hydrocarbons	5	ND	110	330
Gasoline Fraction (C_5-C_{12})	15	30	600	1,200

* Raised MRL due to high analyte concentration requiring sample dilution.

3S22/0e0194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S951275
Project:	0805-135.04 / TO# 18334.00 / 6148 Oakland	**Date Collected:**	10/11/95
Sample Matrix:	Vapor	**Date Received:**	10/12/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name:	**Method Blank**
Lab Code:	S951012-VB
Date Analyzed:	10/12/95

Analyte	**MRL**	
Benzene	0.1	ND
Toluene	0.1	ND
Ethylbenzene	0.1	ND
Total Xylenes	0.2	ND
Total Volatile Hydrocarbons		
C_1 - C_4 Hydrocarbons	5	ND
C_5 - C_8 Hydrocarbons	5	ND
C_9 - C_{12} Hydrocarbons	5	ND
Gasoline Fraction (C_5-C_{12})	15	ND

APPENDIX A

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 0805-135.04 / TO# 18334.00 / 6148 Oakland
Sample Matrix: Vapor

Service Request: S951275
Date Collected: 10/11/95
Date Received: 10/12/95
Date Extracted:
Date Analyzed: 10/12/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name: Batch QC
Lab Code: S951276-002

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.5	20	22	21	10
Toluene	0.5	48	51	50	6
Ethylbenzene	0.5	19	21	20	10
Xylenes, Total	1	140	150	140	7
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	20	<100 *	<100 *	<100 *	<1
C_5 - C_8 Hydrocarbons	20	1,500	1,600	1,600	6
C_9 - C_{12} Hydrocarbons	20	650	740	700	13
Gasoline Fraction (C_4-C_{12})	60	2,100	2,300	2,200	9

* Raised MRL due to high analyte concentration requiring sample dilution.

DUP1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 0805-135.04 / TO# 18334.00 / 6148 Oakland
Sample Matrix: Vapor

Service Request: S951275
Date Collected: 10/11/95
Date Received: 10/12/95
Date Extracted: NA
Date Analyzed: 10/12/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name: Batch QC
Lab Code: S951276-002

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.1	6.3	6.9	6.6	9
Toluene	0.1	13	14	14	7
Ethylbenzene	0.1	4.4	4.8	4.6	9
Xylenes, Total	0.2	32	34	33	6
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	5	<30 *	<30 *	<30 *	<1
C_5 - C_8 Hydrocarbons	5	410	440	420	7
C_9 - C_{12} Hydrocarbons	5	180	200	190	11
Gasoline Fraction (C_5-C_{12})	15	580	630	600	8

* Raised MRL due to high analyte concentration requiring sample dilution.

DUP1S/060194

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 18334.00

Chain of Custody

ARCO Facility no. 6148	City (Facility) Oakland	Project manager (Consultant) V. Vorugunti	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) 4085377 8697	Telephone no. (Consultant) 4084537300	Fax no. (Consultant) 408 4530452
Consultant name EMCON	Address (Consultant) 1921 Ringwood San Jose, CA.		Contract number 07077

Method of shipment: Tech

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other (Vapor)	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH Gas 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 ☐		
E-1	1	1			X			10/11/95	14:11		X											
I-2	2	1			X			↓	14:15		X											
I-1	3	1			X			↓	14:20		X											

Special detection Limit/reporting: report in mg/m³ & ppmv

Special QA/QC

Remarks: 0805-135.04

Lab number: 950275

Turnaround time
- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☑

Condition of sample: Inflated		Temperature received: RT	
Relinquished by sampler	Date 10/12/95 Time 0948	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory Joanne Brown	Date 10/12/95 Time 0948

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant
APC-3292 (2-91)

Due 10/26