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

Date March 31, 1996
Project 20805-123.002

To:

Mr. Barney Chan
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harborbay Parkway, Suite 250
Alameda, California 94502-6577

96 APR -1 PM 4:20
ENVIRONMENTAL PROTECTION

We are enclosing:

Copies	Description
1	Fourth quarter 1995 groundwater monitoring results and remediation system performance evaluation report, ARCO service station 2035, Albany, California

For your:		Sent by:	
	X Use		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. Plaese call if you have questions or comments.

John C. Young
Project Manager

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

ARCO Products Company

Date: March 31, 1996

Re: ARCO Station # 2035 • 1001 San Pablo Avenue • Albany, 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 25, 1996
Project 20805-123.002

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 2035, Albany, California

Dear Mr. Whelan:

This letter presents the results of the fourth quarter 1995 groundwater monitoring program at ARCO Products Company (ARCO) service station 2035, 1001 San Pablo Avenue, Albany, California (Figure 1). Operation and performance data for the interim soil-vapor extraction (SVE) and groundwater extraction remediation systems at the site are also presented. 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 fourth quarter of 1991 to provide information concerning water quality, flow direction, and gradient, and to meet ACHCSA and Regional Water Quality Control Board (RWQCB) requirements regarding underground fuel tank investigations. Water levels are measured quarterly in wells MW-1 through MW-6 and RW-1. Wells MW-5 and MW-6 are sampled annually, during the first quarter of the year. Well MW-2 is sampled semiannually, during the first and third quarters. Wells MW-1, MW-3, MW-4, and RW-1 are sampled quarterly.

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

EMCON performed the fourth quarter 1995 groundwater monitoring event on November 9, 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-6 and RW-1, (2) purging and subsequently sampling groundwater monitoring wells MW-1, MW-3, MW-4, and RW-1 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 3. Historical groundwater elevation data are summarized in Table 2. Table 3 summarizes historical analytical data for analysis of petroleum hydrocarbons and their constituents. Additional historical analytical data for well MW-3 are summarized in Table 4. Historical floating-product recovery data for the site 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 data collected on November 9, 1995, indicate that groundwater beneath the site flows west-southwest with an approximate hydraulic gradient of 0.010 foot per foot (calculated using data from wells MW-1, MW-4, and MW-5). Figure 3 illustrates groundwater contours and analytical data for the fourth quarter of 1995.

REMEDIATION SYSTEM PERFORMANCE EVALUATION

Floating-Product Recovery

Floating product was not recovered at the site during the fourth quarter 1995. The cumulative total of floating product recovered at the site to date is approximately 27.9 gallons (Table 5).

Soil-Vapor Extraction System

Table 6 summarizes SVE system operation and performance data from startup on December 7, 1993, to the end of the fourth quarter 1995 reporting period. The historical SVE system monitoring data log sheets are included in Appendix C.

The SVE system operated for a total of 76.1 days during the 92-day reporting period for the fourth quarter 1995 from October 1, 1995 to January 1, 1996 (82.7 percent operational). Table 6 also summarizes hydrocarbon removal rates, pounds of hydrocarbons removed this period, and cumulative pounds of hydrocarbons removed from SVE system initial startup on December 7, 1993, to the end of the fourth quarter 1995 reporting period. Approximately 1,149.4 pounds (185.4 gallons) of hydrocarbons were recovered by the SVE and groundwater extraction systems during the fourth quarter 1995; a total of approximately 2,987.3 pounds (481.9 gallons) of hydrocarbons has been recovered since system startup on December 7, 1993. The calculations and assumptions made for estimating hydrocarbon removal rates for the SVE system are explained in the footnotes for Table 6. Historical TVHG and benzene concentrations for the SVE system are graphically illustrated in Figure 4; Figure 5 depicts historical SVE system hydrocarbon removal rates.

Table 7 summarizes the operating status of the individual vapor extraction wells since startup of the SVE system on December 7, 1993, to the end of the fourth quarter 1995 reporting period. To maximize hydrocarbon removal rates, vapor extraction wells were typically brought on-line or closed depending on the TVHG concentrations of the vapor extracted from the well.

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

Air-Sparge System

The AS system was not operational during the fourth quarter 1995 and is anticipated to be activated during the first quarter 1996.

Groundwater Remediation System

Table 8 summarizes groundwater remediation system sampling results from system startup to the end of the fourth quarter 1995 reporting period. Table 9 summarizes groundwater remediation system operation and performance data from startup on February 8, 1995, to the end of the fourth quarter 1995 reporting period. The groundwater remediation system operated for a total of 45.7 days during the 71.9-day reporting period for the fourth quarter 1995 from October 11, 1995 to December 22, 1995 (64 percent operational).

Table 9 also summarizes hydrocarbon removal rates, pounds of hydrocarbons removed this period, and cumulative pounds of hydrocarbons removed, from system startup on February 8, 1995, to the end of the fourth quarter 1995 reporting period. A total of approximately 17.3 pounds (2.78 gallons) of dissolved-phase hydrocarbons was recovered by the groundwater extraction system during the fourth quarter 1995. To date a total of approximately 24.4 pounds (3.93 gallons) of hydrocarbons has been recovered from the site from initial system startup on February 8, 1995. The calculations and assumptions made for estimating hydrocarbon removal rates for the groundwater remediation system are explained in the footnotes for Table 9.

Historical TPHG and benzene concentrations for the groundwater extraction system are graphically illustrated in Figure 6; Figure 7 depicts historical groundwater extraction system hydrocarbon removal rates.

Copies of all field monitoring data sheets, and laboratory analytical results for all water samples collected for the groundwater remediation system during the fourth quarter 1995 are provided in Appendices F, and G, respectively.

LIMITATIONS

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

SITE STATUS UPDATE

This update reports site activities performed during the fourth quarter of 1995, and the anticipated site activities for the first quarter of 1996.

Fourth Quarter 1995 Activities

- Prepared and submitted quarterly groundwater monitoring results and remediation system performance evaluation report for third quarter 1995.
- Performed quarterly groundwater monitoring for fourth quarter 1995.
- Performed operation and maintenance activities for the SVE and groundwater extraction systems during fourth quarter 1995.

Work Anticipated for First Quarter 1996

- Prepare and submit quarterly groundwater monitoring results and remediation system performance evaluation report for fourth quarter 1995.
- Perform quarterly groundwater monitoring for first quarter 1996.
- Perform startup of AS system.
- Perform operation and maintenance activities for the SVE and groundwater extraction systems during first quarter 1996.

Please call if you have questions.

Sincerely,

EMCON

Sailaja Yelamanchili
Staff Engineer

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

REGISTERED GEOLOGIST
JOHN CHARLES YOUNG
Exp 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, Well MW-3
Table 5 -	Approximate Cumulative Floating Product Recovered
Table 6 -	Soil-Vapor Extraction System Operation and Performance Data
Table 7 -	Soil-Vapor Extraction Well Data
Table 8 -	Influent and Effluent Groundwater Analyses Summary Report
Table 9 -	Estimated Total Dissolved TPHG and Benzene Removed - Summary Report
Figure 1 -	Site Location
Figure 2 -	Site Plan
Figure 3 -	Groundwater Data, Fourth Quarter 1995
Figure 4 -	Historical SVE System TVHG and Benzene Concentrations
Figure 5 -	Historical SVE System Hydrocarbon Removal Rates
Appendix A -	Field Data Sheets, Fourth Quarter 1995 Groundwater Monitoring Event
Appendix B -	Analytical Results and Chain-of-Custody Documentation, Fourth Quarter 1995 Groundwater Monitoring Event
Appendix C -	SVE System Monitoring Data Log Sheets
Appendix D -	Field Data Sheets, SVE System Operation and Maintenance Visits, Fourth Quarter 1995
Appendix E -	Analytical Results and Chain-of-Custody Documentation, SVE System Air Samples, Fourth Quarter 1995
Appendix F -	Field Data Sheets, Groundwater Treatment System, Operation and Maintenance Visits, Fourth Quarter 1995
Appendix G -	Analytical Results and Chain-of-Custody Documentation, Groundwater Treatment System, Fourth Quarter 1995

cc: Barney Chan ACHCSA
Kevin Graves, RWQCB-SFBR

Table 1
Groundwater Monitoring Data
Fourth Quarter 1995

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 03-19-96

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 and Grease SM 5520B&F	Oil and Grease SM 5520C	Oil and Grease SM 5520F	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	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	11-09-95	41.41	12.25	29.16	ND	WSW	0.01	11-09-95	58	14	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	11-09-95	40.38	13.12	27.26	ND	WSW	0.01	11-09-95	Not sampled: not scheduled for chemical analysis											
MW-3	11-09-95	41.44	12.77	28.67	ND	WSW	0.01	11-09-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	600	--
MW-4	11-09-95	40.33	11.97	28.36	ND	WSW	0.01	11-09-95	<50	<0.5	<0.5	<0.5	<0.5	--	89	--	--	--	--	--
MW-5	11-09-95	41.84	12.52	29.32	ND	WSW	0.01	11-09-95	Not sampled: not scheduled for chemical analysis											
MW-6	11-09-95	40.13	14.13	26.00	ND	WSW	0.01	11-09-95	Not sampled: not scheduled for chemical analysis											
RW-1	11-09-95	40.33	20.61	19.72	ND	WSW	0.01	11-09-95	1600	79	46	13	240	--	--	--	--	--	--	--

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 States Environmental Protection Agency
MTBE: methyl-tert-butyl ether
SM: standard method
TRPH: total recoverable petroleum hydrocarbons
TPHD: total petroleum hydrocarbons as diesel, California DHS LUFT Method
ND: none detected
WSW: west-southwest
-- : not analyzed

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Table 2
Historical Groundwater Elevation Data

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 03-19-96

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	10-29-91	41.41	11.86	29.55	ND	NR	NR
MW-1	11-07-91	41.41	10.94	30.47	ND	NR	NR
MW-1	11-14-91	41.41	10.97	30.44	ND	NR	NR
MW-1	01-19-92	41.41	10.06	31.35	ND	NR	NR
MW-1	02-19-92	41.41	8.65	32.76	ND	NR	NR
MW-1	03-19-92	41.41	8.33	33.08	ND	NR	NR
MW-1	04-21-92	41.41	9.32	32.09	ND	NR	NR
MW-1	05-12-92	41.41	9.82	31.59	ND	NR	NR
MW-1	06-12-92	41.41	10.50	30.91	ND	NR	NR
MW-1	07-15-92	41.41	10.69	30.72	ND	NR	NR
MW-1	08-07-92	41.41	10.53	30.88	ND	NR	NR
MW-1	09-08-92	41.41	11.04	30.37	ND	NR	NR
MW-1	10-26-92	41.41	11.24	30.17	ND	NR	NR
MW-1	11-23-92	41.41	10.90	30.51	ND	NR	NR
MW-1	12-16-92	41.41	9.40	32.01	ND	NR	NR
MW-1	01-13-93	41.41	7.73	33.68	ND	NR	NR
MW-1	02-22-93	41.41	7.56	33.85	ND	NR	NR
MW-1	03-25-93	41.41	8.48	32.93	ND	NR	NR
MW-1	04-13-93	41.41	8.91	32.50	ND	NR	NR
MW-1	05-22-93	41.41	9.68	31.73	ND	NR	NR
MW-1	06-17-93	41.41	9.68	31.73	ND	NR	NR
MW-1	07-27-93	41.41	10.09	31.32	ND	NR	NR
MW-1	08-24-93	41.41	10.51	30.90	ND	NR	NR
MW-1	12-08-93	41.41	10.39	31.02	ND	NR	NR
MW-1	02-01-94	41.41	9.29	32.12	ND	NR	NR
MW-1	04-26-94	41.41	9.25	32.16	ND	NR	NR
MW-1	07-29-94	41.41	9.87	31.54	ND	WSW	0.016
MW-1	11-15-94	41.41	8.76	32.65	ND	WSW	0.019
MW-1	03-24-95	41.41	6.21	35.20	ND	NW	0.037
MW-1	05-24-95	41.41	9.37	32.04	ND	WNW	0.013
MW-1	08-22-95	41.41	10.30	31.11	ND	SW	0.012
MW-1	11-09-95	41.41	12.25	29.16	ND	WSW	0.01

Table 2
Historical Groundwater Elevation Data

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 03-19-96

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	10-29-91	40.38	11.10	29.28	ND	NR	NR
MW-2	11-07-91	40.38	11.20	29.18	ND	NR	NR
MW-2	11-14-91	40.38	11.21	29.17	ND	NR	NR
MW-2	01-19-92	40.38	10.44	29.94	ND	NR	NR
MW-2	02-19-92	40.38	8.70	31.68	ND	NR	NR
MW-2	03-19-92	40.38	8.84	31.54	ND	NR	NR
MW-2	04-21-92	40.38	9.80	30.58	ND	NR	NR
MW-2	05-12-92	40.38	10.29	30.09	ND	NR	NR
MW-2	06-12-92	40.38	10.95	29.43	ND	NR	NR
MW-2	07-15-92	40.38	11.15	29.23	ND	NR	NR
MW-2	08-07-92	40.38	11.01	29.37	ND	NR	NR
MW-2	09-08-92	40.38	11.41	28.97	ND	NR	NR
MW-2	10-26-92	40.38	11.60	28.78	ND	NR	NR
MW-2	11-23-92	40.38	7.31	33.07	ND	NR	NR
MW-2	12-16-92	40.38	9.82	30.56	ND	NR	NR
MW-2	01-13-93	40.38	8.25	32.13	ND	NR	NR
MW-2	02-22-93	40.38	8.25	32.13	ND	NR	NR
MW-2	03-25-93	40.38	8.82	31.56	ND	NR	NR
MW-2	04-13-93	40.38	9.30	31.08	ND	NR	NR
MW-2	05-22-93	40.38	10.57	29.81	ND	NR	NR
MW-2	06-17-93	40.38	10.25	30.13	ND	NR	NR
MW-2	07-27-93	40.38	10.48	29.90	ND	NR	NR
MW-2	08-24-93	40.38	10.82	29.56	ND	NR	NR
MW-2	12-08-93	40.38	10.68	29.70	ND	NR	NR
MW-2	02-01-94	40.38	9.66	30.72	ND	NR	NR
MW-2	04-26-94	40.38	9.60	30.78	ND	NR	NR
MW-2	07-29-94	40.38	10.61	29.77	ND	WSW	0.016
MW-2	11-15-94	40.38	9.23	31.15	ND	WSW	0.019
MW-2	03-24-95	40.38	6.96	33.42	ND	NW	0.037
MW-2	05-24-95	40.38	10.02	30.36	ND	WNW	0.013
MW-2	08-22-95	40.38	10.87	29.51	ND	SW	0.012
MW-2	11-09-95	40.38	13.12	27.26	ND	WSW	0.01

Table 2
Historical Groundwater Elevation Data

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 03-19-96

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	10-29-91	41.44	11.62	29.82	ND	NR	NR
MW-3	11-07-91	41.44	11.52	29.92	ND	NR	NR
MW-3	11-14-91	41.44	11.50	29.94	ND	NR	NR
MW-3	01-19-92	41.44	10.56	30.88	ND	NR	NR
MW-3	02-19-92	41.44	9.52	31.92	ND	NR	NR
MW-3	03-19-92	41.44	9.01	32.43	ND	NR	NR
MW-3	04-21-92	41.44	9.70	31.74	ND	NR	NR
MW-3	05-12-92	41.44	10.29	31.15	ND	NR	NR
MW-3	06-12-92	41.44	11.26	30.18	ND	NR	NR
MW-3	07-15-92	41.44	11.28	30.16	ND	NR	NR
MW-3	08-07-92	41.44	11.15	30.29	ND	NR	NR
MW-3	09-08-92	41.44	11.70	29.74	ND	NR	NR
MW-3	10-26-92	41.44	12.15	29.29	ND	NR	NR
MW-3	11-23-92	41.44	12.55	28.89	ND	NR	NR
MW-3	12-16-92	41.44	10.15	31.29	ND	NR	NR
MW-3	01-13-93	41.44	9.12	32.32	ND	NR	NR
MW-3	02-22-93	41.44	8.18	33.26	ND	NR	NR
MW-3	03-25-93	41.44	8.57	32.87	ND	NR	NR
MW-3	04-13-93	41.44	9.55	31.89	ND	NR	NR
MW-3	05-22-93	41.44	10.56	30.88	ND	NR	NR
MW-3	06-17-93	41.44	10.41	31.03	ND	NR	NR
MW-3	07-27-93	41.44	10.53	30.91	ND	NR	NR
MW-3	08-24-93	41.44	10.86	30.58	ND	NR	NR
MW-3	12-08-93	41.44	10.91	30.53	ND	NR	NR
MW-3	02-01-94	41.44	9.71	31.73	ND	NR	NR
MW-3	04-26-94	41.44	9.56	31.88	ND	NR	NR
MW-3	07-29-94	41.44	10.65	30.79	ND	WSW	0.016
MW-3	11-15-94	41.44	9.25	32.19	ND	WSW	0.019
MW-3	03-24-95	41.44	7.29	34.15	ND	NW	0.037
MW-3	05-24-95	41.44	9.53	31.91	ND	WNW	0.013
MW-3	08-22-95	41.44	11.19	30.25	ND	SW	0.012
MW-3	11-09-95	41.44	12.77	28.67	ND	WSW	0.01

Table 2
Historical Groundwater Elevation Data

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 03-19-96

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	01-13-93	40.33	8.05	32.28	ND	NR	NR
MW-4	02-22-93	40.33	7.58	32.75	ND	NR	NR
MW-4	03-25-93	40.33	8.27	32.06	ND	NR	NR
MW-4	04-13-93	40.33	8.54	31.79	ND	NR	NR
MW-4	05-22-93	40.33	9.52	30.81	ND	NR	NR
MW-4	06-17-93	40.33	9.53	30.80	ND	NR	NR
MW-4	07-27-93	40.33	10.14	30.19	ND	NR	NR
MW-4	08-24-93	40.33	10.42	29.91	ND	NR	NR
MW-4	12-08-93	40.33	10.31	30.02	ND	NR	NR
MW-4	02-01-94	40.33	9.10	31.23	ND	NR	NR
MW-4	04-26-94	40.33	8.94	31.39	ND	NR	NR
MW-4	07-29-94	40.33	10.02	30.31	ND	WSW	0.016
MW-4	11-15-94	40.33	8.47	31.86	ND	WSW	0.019
MW-4	03-24-95	40.33	5.92	34.41	ND	NW	0.037
MW-4	05-24-95	40.33	9.23	31.10	ND	WNW	0.013
MW-4	08-22-95	40.33	10.61	29.72	ND	SW	0.012
MW-4	11-09-95	40.33	11.97	28.36	ND	WSW	0.01
MW-5	01-13-93	41.84	8.22	33.62	ND	NR	NR
MW-5	02-22-93	41.84	7.92	33.92	ND	NR	NR
MW-5	03-25-93	41.84	8.67	33.17	ND	NR	NR
MW-5	04-13-93	41.84	9.18	32.66	ND	NR	NR
MW-5	05-22-93	41.84	10.12	31.72	ND	NR	NR
MW-5	06-17-93	41.84	10.03	31.81	ND	NR	NR
MW-5	07-27-93	41.84	10.74	31.10	ND	NR	NR
MW-5	08-24-93	41.84	11.02	30.82	ND	NR	NR
MW-5	12-08-93	41.84	10.92	30.92	ND	NR	NR
MW-5	02-01-94	41.84	9.74	32.10	ND	NR	NR
MW-5	04-26-94	41.84	9.51	32.33	ND	NR	NR
MW-5	07-29-94	41.84	10.54	31.30	ND	WSW	0.016
MW-5	11-15-94	41.84	9.10	32.74	ND	WSW	0.019
MW-5	03-24-95	41.84	6.23	35.61	ND	NW	0.037
MW-5	05-24-95	41.84	9.61	32.23	ND	WNW	0.013
MW-5	08-22-95	41.84	11.12	30.72	ND	SW	0.012
MW-5	11-09-95	41.84	12.52	29.32	ND	WSW	0.01

Table 2
Historical Groundwater Elevation Data

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 03-19-96

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	01-13-93	40.13	9.84	30.29	ND	NR	NR
MW-6	02-22-93	40.13	9.94	30.19	ND	NR	NR
MW-6	03-25-93	40.13	10.68	29.45	ND	NR	NR
MW-6	04-13-93	40.13	11.12	29.01	ND	NR	NR
MW-6	05-22-93	40.13	11.74	28.39	ND	NR	NR
MW-6	06-17-93	40.13	11.75	28.38	ND	NR	NR
MW-6	07-27-93	40.13	12.20	27.93	ND	NR	NR
MW-6	08-24-93	40.13	12.41	27.72	ND	NR	NR
MW-6	12-08-93	40.13	10.11	30.02	ND	NR	NR
MW-6	02-01-94	40.13	11.80	28.33	ND	NR	NR
MW-6	04-26-94	40.13	11.33	28.80	ND	NR	NR
MW-6	07-29-94	40.13	12.16	27.97	ND	WSW	0.016
MW-6	11-15-94	40.13	11.01	29.12	ND	WSW	0.019
MW-6	03-24-95	40.13	9.03	31.10	ND	NW	0.037
MW-6	05-24-95	40.13	12.45	27.68	ND	WNW	0.013
MW-6	08-22-95	40.13	13.32	26.81	ND	SW	0.012
MW-6	11-09-95	40.13	14.13	26.00	ND	WSW	0.01

Table 2
Historical Groundwater Elevation Data

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 03-19-96

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
RW-1	10-29-91	40.33	10.85	29.48	Sheen	NR	NR
RW-1	11-07-91	40.33	11.97	28.36	0.01	NR	NR
RW-1	11-14-91	40.33	11.03	29.30	0.01	NR	NR
RW-1	01-19-92	40.33	^10.22	^30.11	3.26	NR	NR
RW-1	02-19-92	40.33	^8.49	^31.84	2.14	NR	NR
RW-1	03-19-92	40.33	^8.50	^31.83	0.50	NR	NR
RW-1	04-21-92	40.33	^9.68	^30.65	0.03	NR	NR
RW-1	05-12-92	40.33	10.47	29.86	NR	NR	NR
RW-1	06-12-92	40.33	11.41	28.92	NR	NR	NR
RW-1	07-15-92	40.33	11.35	28.98	ND	NR	NR
RW-1	08-07-92	40.33	^10.80	^29.53	0.02	NR	NR
RW-1	09-08-92	40.33	^10.80	^29.53	0.62	NR	NR
RW-1	10-26-92	40.33	^11.42	^28.91	0.04	NR	NR
RW-1	11-23-92	40.33	10.94	29.39	Sheen	NR	NR
RW-1	12-16-92	40.33	^9.78	^30.55	0.51	NR	NR
RW-1	01-13-93	40.33	8.35	31.98	Skimmer	NR	NR
RW-1	02-22-93	40.33	^7.94	^32.39	0.01	NR	NR
RW-1	03-25-93	40.33	8.81	31.52	ND	NR	NR
RW-1	04-13-93	40.33	^9.67	NR	NR	NR	NR
RW-1	05-22-93	40.33	10.04	30.29	Sheen	NR	NR
RW-1	06-17-93	40.33	^10.26	^30.07	0.01	NR	NR
RW-1	07-27-93	40.33	10.58	29.75	Sheen	NR	NR
RW-1	08-24-93	40.33	^10.80	^29.53	0.05	NR	NR
RW-1	12-08-93	40.33	^10.46	^29.87	0.30	NR	NR
RW-1	02-01-94	40.33	1.00	39.33	ND	NR	NR
RW-1	04-26-94	40.33	9.30	** 31.06	0.04	NR	NR
RW-1	07-29-94	40.33	9.91	** 30.43	0.02	WSW	0.016
RW-1	11-15-94	40.33	8.89	** 31.51	0.10	WSW	0.019
RW-1	03-24-95	40.33	9.32	** 31.02	0.01	NW	0.037
RW-1	05-24-95	40.33	9.75	** 30.60	0.03	WNW	0.013
RW-1	08-22-95	40.33	10.86	** 29.48	0.02	SW	0.012
RW-1	11-09-95	40.33	20.61	19.72	ND	WSW	0.01

ft-MSL: elevation in feet, relative to mean sea level
MWN: ground-water flow direction and gradient apply to the entire monitoring well network
ND: none detected
NR: not reported; data not available
WSW: west-southwest
NW: northwest
WNW: west-northwest
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)]
**: [corrected elevation (Z')] = Z + (h * 0.73); where Z = measured elevation, h = floating product thickness, 0.73 = density ratio of oil to water

Table 3
Historical Groundwater Analytical Data
Petroleum Hydrocarbons and Their Constituents

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 02-12-96

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 and Grease SM 5520B&F	Oil and Grease SM 5520C	Oil and Grease SM 5520F	TRPH EPA 418.1	TPHD LUFT Method
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	10-29-91	620	76	69	15	60	--	--	--	--	--	--	--
MW-1	03-19-92	6500	2600	89	42	290	--	--	--	--	--	--	--
MW-1	06-12-92	2900	1100	2.5	21	15	--	--	--	--	--	--	--
MW-1	09-08-92	820	350	<5	<5	<5	--	--	--	--	--	--	--
MW-1	10-26-92	190	68	<0.5	0.6	<0.5	--	--	--	--	--	--	--
MW-1	01-13-93	430	130	5.3	5	9	--	--	--	--	--	--	--
MW-1	04-13-93	5300	2100	<20	63	36	--	--	--	--	--	--	--
MW-1	08-24-93	630	230	<2.5	3.1	3.3	--	--	--	--	--	--	--
MW-1	12-08-93	81	20	<0.5	0.9	<0.5	--	--	--	--	--	--	--
MW-1	02-01-94	<50	13	<0.5	0.5	0.6	--	--	--	--	--	--	--
MW-1	04-26-94	990	290	3.5	18	14	--	--	--	--	--	--	--
MW-1	07-29-94	760	280	<2.5	7.1	<2.5	--	--	--	--	--	--	--
MW-1	11-15-94	570	150	7.3	<2.5	30	--	--	--	--	--	--	--
MW-1	03-24-95	8800	3600	<50	62	99	--	--	--	--	--	--	--
MW-1	05-24-95	4800	2000	<20	52	<20	--	--	--	--	--	--	--
MW-1	08-22-95	780	310	<2.5	12	<2.5	14	--	--	--	--	--	--
MW-1	11-09-95	58	14	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	10-29-91	<60	2.4	4.6	0.48	2.3	--	--	--	--	--	--	--
MW-2	03-19-92	<50	6.8	0.9	<0.5	1.1	--	--	--	--	--	--	--
MW-2	06-12-92	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	09-08-92	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	10-26-92	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	01-13-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	04-13-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	08-24-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	12-08-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	02-01-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	04-26-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	07-29-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	11-15-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	03-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-2	05-24-95	Not sampled: not scheduled for chemical analysis											
MW-2	08-22-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--	--	--	--
MW-2	11-09-95	Not sampled: not scheduled for chemical analysis											

Table 3
Historical Groundwater Analytical Data
Petroleum Hydrocarbons and Their Constituents

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 02-12-96

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 and Grease SM 5520B&F	Oil and Grease SM 5520C	Oil and Grease SM 5520F	TRPH EPA 418.1	TPHD LUFT Method
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-3	10-29-91	32	2.1	2.8	0.35	1.8	--	--	<5000	--	--	--	--
MW-3	03-19-92	2100	780	8.8	16	58	--	--	--	--	--	--	--
MW-3	06-12-92	720	210	<2.5	23	4	--	--	--	--	--	--	--
MW-3	09-08-92	<50	5.3	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-3	10-26-92	<50	0.6	<0.5	<0.5	<0.5	--	--	--	600	600	--	<50
MW-3	01-13-93	<50	1.1	<0.5	<0.5	<0.5	--	--	--	780	1100	--	--
MW-3	04-13-93	68	13	<0.5	1.6	1.1	--	--	--	<500	<500	--	--
MW-3	08-24-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	<500	<500	--	--
MW-3	12-08-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	900	500	--	--
MW-3	02-01-94	<50	1.9	<0.5	2.1	<0.5	--	--	--	<500	<500	--	--
MW-3	04-26-94	<50	1.1	<0.5	2.4	0.9	--	--	--	--	--	<600	--
MW-3	07-29-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	600	--
MW-3	11-15-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	<500	--
MW-3	03-24-95	51	0.8	<0.5	2.4	<0.5	--	--	--	--	--	<500	--
MW-3	05-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	<500	--
MW-3	08-22-95	<50	<0.5	<0.5	<0.5	<0.5	79	--	--	--	--	<500	--
MW-3	11-09-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	600	--
MW-4	01-13-93	<50	<0.5	1.3	<0.5	1.6	--	--	--	--	--	--	--
MW-4	04-13-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-4	08-24-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-4	12-08-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-4	02-01-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-4	04-26-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-4	07-29-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-4	11-15-94	220	12	19	0.9	39	--	--	--	--	--	--	--
MW-4	03-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-4	05-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-4	08-22-95	<50	<0.5	<0.5	<0.5	<0.5	99	--	--	--	--	--	--
MW-4	11-09-95	<50	<0.5	<0.5	<0.5	<0.5	--	89	--	--	--	--	--

Table 3
Historical Groundwater Analytical Data
Petroleum Hydrocarbons and Their Constituents

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 02-12-96

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 and Grease SM 5520B&F	Oil and Grease SM 5520C	Oil and Grease SM 5520F	TRPH EPA 418.1	TPHD LUFT Method
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-5	01-13-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	04-13-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	08-24-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	12-08-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	02-01-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	04-26-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	07-29-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	11-15-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	03-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-5	05-24-95	Not sampled: not scheduled for chemical analysis											
MW-5	08-22-95	Not sampled: not scheduled for chemical analysis											
MW-5	11-09-95	Not sampled: not scheduled for chemical analysis											
MW-6	01-13-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-6	04-13-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-6	08-24-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-6	12-08-93	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-6	02-01-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-6	04-26-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-6	07-29-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-6	11-15-94	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-6	03-24-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-6	05-24-95	Not sampled: not scheduled for chemical analysis											
MW-6	08-22-95	Not sampled: not scheduled for chemical analysis											
MW-6	11-09-95	Not sampled: not scheduled for chemical analysis											

Table 3
Historical Groundwater Analytical Data
Petroleum Hydrocarbons and Their Constituents

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 02-12-96

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 and Grease SM 5520B&F	Oil and Grease SM 5520C	Oil and Grease SM 5520F	TRPH EPA 418.1	TPHD LUFT Method
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
RW-1	10-29-91	Not sampled: well contained floating product											
RW-1	03-19-92	Not sampled: well contained floating product											
RW-1	06-12-92	Not sampled: well contained floating product											
RW-1	09-08-92	Not sampled: well contained floating product											
RW-1	10-23-92	Not sampled: well contained floating product											
RW-1	01-13-93	Not sampled: skimmer contained floating product											
RW-1	04-13-93	Not sampled: well contained floating product											
RW-1	08-24-93	Not sampled: well contained floating product											
RW-1	12-08-93	Not sampled: well contained floating product											
RW-1	02-01-94	Not sampled: well connected to the remediation system											
RW-1	04-26-94	Not sampled: well contained floating product											
RW-1	07-29-94	Not sampled: well contained floating product											
RW-1	11-15-94	Not sampled: well contained floating product											
RW-1	03-24-95	11000	560	660	150	1700	--	--	--	--	--	--	--
RW-1	05-24-95	Not sampled: well contained floating product											
RW-1	08-22-95	Not sampled: well contained floating product											
RW-1	11-09-95	1600	79	46	13	240	--	--	--	--	--	--	--

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
TRPH: total recoverable petroleum hydrocarbons
TPHD: total petroleum hydrocarbons as diesel, California DHS LUFT Method
- - : not analyzed

Table 4
Historical Groundwater Analytical Data
Additional Parameters

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 02-12-96

Well Designation	Water Sample Field Date	Total VOCs EPA 624	Total SVOCs EPA 3510/ 8270	Total PCBs EPA 3510/ 8080	Cadmium EPA 6010	Chromium EPA 6010	Lead EPA 7421	Zinc EPA 6010	Nickel EPA 6010
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
MW-3	10-29-91	ND(a)	--	--	<10	<10	<5	45	<50
MW-3	03-19-92	--	--	--	--	--	--	--	--
MW-3	06-12-92	--	--	--	--	--	--	--	--
MW-3	09-08-92	--	--	--	--	--	--	--	--
MW-3	10-26-92	ND(b)	--	--	--	--	--	--	--
MW-3	12-01-92	--	ND(c)	ND(d)	--	--	--	--	--
MW-3	01-13-93	Not analyzed: sampling for additional parameters was discontinued							

VOCs: volatile organic compounds
EPA: United Statest Environmental Protection Agency
µg/L: micrograms per liter
SVOCs: semi-volatile organic compounds
PCBs: polychlorinated biphenyls analyzed
ND: not detected (31 compounds tested for VOCs were nondetectable)
(a): all 37 compounds analyzed were nondetectable except for toluene (3.0 ppb)
(b): all 41 compounds analyzed were nondetectable
(c): all 34 compounds analyzed were nondetectable
(d): all 7 compounds analyzed were nondetectable
-- : not analyzed

Table 5
Approximate Cumulative Floating Product Recovered

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 02-12-96

Well Designations	Date	Floating Product Recovered gallons
RW-1	1992	22.3
RW-1	1993	1.0
RW-1	1994	0.0
AS-1, AS-2, RW-1, VW-1, VW-2, and VW-7	1995	4.6
	1992 to 1995 Total:	27.9

Table 6
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 2035
Location: 1001 San Pablo Avenue
Albany, California

Consultant: EMCON
1921 Ringwood Avenue
San Jose, California

Vapor Treatment Unit: Therm Tech Model VAC-10 thermal/catalytic oxidizer

Start-Up Date: 12-07-93
Reporting Period From: 12-07-93
To: 01-01-96

Date Begin:		12-07-93	12-08-93	12-09-93	12-10-93	12-15-93
Date End:		12-08-93	12-09-93	12-10-93	12-15-93	12-16-93
Mode of Oxidation:		Therm-Ox (17)	Therm-Ox	Therm-Ox	Therm-Ox	Therm-Ox
Days of Operation:		0.88	0.00	0.96	5.04	0.75
Days of Downtime:		0.13	0.94	0.04	0.00	0.00
Average Vapor Concentrations (1)						
Well Field Influent:	ppmv (2) as gasoline (3)	2800	NA (18)	NA	NA	NA
	mg/m3 (4) as gasoline	10000	NA	NA	NA	NA
	ppmv as benzene (5)	170	NA	NA	NA	NA
	mg/m3 as benzene	540	NA	NA	NA	NA
System Influent:	ppmv as gasoline	390	NA	390	410	500
	mg/m3 as gasoline	1400	NA	1400	1500	1800
	ppmv as benzene	12	NA	19	31	24
	mg/m3 as benzene	38	NA	60	100	79
System Effluent:	ppmv as gasoline	21	NA	36	6	NA
	mg/m3 as gasoline	76	NA	130	21	NA
	ppmv as benzene	0.7	NA	1	<0.01	NA
	mg/m3 as benzene	2.3	NA	3.1	<0.05	NA
Average Well Field Flow Rate (6), scfm (7):		10.0	0.0	10.0	5.0	45.0
Average System Influent Flow Rate (6), scfm:		100.0	0.0	100.0	87.0	100.0
Average Destruction Efficiency (8), percent (9):		94.6	NA	90.7	98.6	NA
Average Emission Rates (10), pounds per day (11)						
Gasoline:		0.68	0.00	1.17	0.16	NA
Benzene:		0.02	0.00	0.03	<0.00	NA
Operating Hours This Period:		21.00	0.00	23.00	121.00	18.00
Operating Hours To Date:		21.0	21.0	44.0	165.0	183.0
SVE Pounds/ Hour Removal Rate, as gasoline (12):		0.52	0.00	0.52	0.49	0.67
SVE Pounds Removed This Period, as gasoline (13):		11.00	0.00	12.05	59.10	12.13
GWE Pounds Removed This Period, as gasoline (14):		0.00	0.00	0.00	0.00	0.00
Total Pounds Removed This Period, as gasoline (15):		11.00	0.00	12.05	59.10	12.13
Total Pounds Removed To Date, as gasoline:		11.0	11.0	23.1	82.2	94.3
Total Gallons Removed This Period, as gasoline (16):		1.77	0.00	1.94	9.53	1.96
Total Gallons Removed To Date, as gasoline:		1.8	1.8	3.7	13.3	15.2

Table 6
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 2035
Location: 1001 San Pablo Avenue
Albany, California

Consultant: EMCON
1921 Ringwood Avenue
San Jose, California

Vapor Treatment Unit: Therm Tech Model VAC-10 thermal/catalytic oxidizer

Start-Up Date: 12-07-93
Reporting Period From: 12-07-93
To: 01-01-96

Date Begin:		12-16-93	12-21-93	12-25-93	12-29-93	12-31-93
Date End:		12-21-93	12-25-93	12-29-93	12-31-93	01-07-94
Mode of Oxidation:		Therm-Ox	Therm-Ox	Therm-Ox	Therm-Ox	Therm-Ox
Days of Operation:		0.00	4.33	0.00	1.79	0.00
Days of Downtime:		5.00	0.00	4.00	0.00	6.58
Average Vapor Concentrations (1)						
Well Field Influent:	ppmv (2) as gasoline (3)	NA	NA	NA	NA	NA
	mg/m3 (4) as gasoline	NA	NA	NA	NA	NA
	ppmv as benzene (5)	NA	NA	NA	NA	NA
	mg/m3 as benzene	NA	NA	NA	NA	NA
System Influent:	ppmv as gasoline	NA	NA	NA	NA	NA
	mg/m3 as gasoline	NA	NA	NA	NA	NA
	ppmv as benzene	NA	NA	NA	NA	NA
	mg/m3 as benzene	NA	NA	NA	NA	NA
System Effluent:	ppmv as gasoline	NA	NA	NA	NA	NA
	mg/m3 as gasoline	NA	NA	NA	NA	NA
	ppmv as benzene	NA	NA	NA	NA	NA
	mg/m3 as benzene	NA	NA	NA	NA	NA
Average Well Field Flow Rate (6), scfm (7):		0.0	20.0	0.0	54.0	0.0
Average System Influent Flow Rate (6), scfm:		0.0	100.0	0.0	78.0	0.0
Average Destruction Efficiency (8), percent (9):		NA	NA	NA	NA	NA
Average Emission Rates (10), pounds per day (11)						
Gasoline:		0.00	0.00	0.00	0.00	0.00
Benzene:		0.00	0.00	0.00	0.00	0.00
Operating Hours This Period:		0.00	104.00	0.00	43.00	0.00
Operating Hours To Date:		183.0	287.0	287.0	330.0	330.0
SVE Pounds/ Hour Removal Rate, as gasoline (12):		0.00	0.00	0.00	0.00	0.00
SVE Pounds Removed This Period, as gasoline (13):		0.00	0.00	0.00	0.00	0.00
GWE Pounds Removed This Period, as gasoline (14):		0.00	0.00	0.00	0.00	0.00
Total Pounds Removed This Period, as gasoline (15):		0.00	0.00	0.00	0.00	0.00
Total Pounds Removed To Date, as gasoline:		94.3	94.3	94.3	94.3	94.3
Total Gallons Removed This Period, as gasoline (16):		0.00	0.00	0.00	0.00	0.00
Total Gallons Removed To Date, as gasoline:		15.2	15.2	15.2	15.2	15.2

Table 6
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 2035
Location: 1001 San Pablo Avenue
Albany, California

Consultant: EMCON
1921 Ringwood Avenue
San Jose, California

Vapor Treatment Unit: Therm Tech Model VAC-10 thermal/catalytic oxidizer

Start-Up Date: 12-07-93
Reporting Period From: 12-07-93
To: 01-01-96

Date Begin:		01-07-94	01-12-94	01-24-94	03-31-94	12-31-94
Date End:		01-12-94	01-24-94	03-31-94	12-31-94	02-06-95
Mode of Oxidation:		Therm-Ox	Therm-Ox	Therm-Ox	Therm-Ox	Therm-Ox
Days of Operation:		5.13	11.88	0.00	0.00	0.40
Days of Downtime:		0.00	0.13	66.29	275.00	36.60
Average Vapor Concentrations (1)						
Well Field Influent:	ppmv (2) as gasoline (3)	NA	NA	NA	NA	NA
	mg/m3 (4) as gasoline	NA	NA	NA	NA	NA
	ppmv as benzene (5)	NA	NA	NA	NA	NA
	mg/m3 as benzene	NA	NA	NA	NA	NA
System Influent:	ppmv as gasoline	NA	690	NA	NA	NA
	mg/m3 as gasoline	NA	2500	NA	NA	NA
	ppmv as benzene	NA	11	NA	NA	NA
	mg/m3 as benzene	NA	37	NA	NA	NA
System Effluent:	ppmv as gasoline	NA	14	NA	NA	NA
	mg/m3 as gasoline	NA	52	NA	NA	NA
	ppmv as benzene	NA	0.29	NA	NA	NA
	mg/m3 as benzene	NA	0.93	NA	NA	NA
Average Well Field Flow Rate (6), scfm (7):		37.0	41.0	0.0	0.0	0.0
Average System Influent Flow Rate (6), scfm:		60.0	64.0	0.0	0.0	0.0
Average Destruction Efficiency (8), percent (9):		97.9	97.9	NA	NA	NA
Average Emission Rates (10), pounds per day (11)						
Gasoline:		0.30	0.30	0.00	0.00	0.00
Benzene:		0.01	0.01	0.00	0.00	0.00
Operating Hours This Period:		123.00	285.00	0.00	0.00	8.90
Operating Hours To Date:		453.0	738.0	738.0	738.0	746.9
SVE Pounds/ Hour Removal Rate, as gasoline (12):		0.48	0.60	0.00	0.00	0.00
SVE Pounds Removed This Period, as gasoline (13):		59.40	170.67	0.00	0.00	0.00
GWE Pounds Removed This Period, as gasoline (14):		0.00	0.00	0.00	0.00	0.00
Total Pounds Removed This Period, as gasoline (15):		59.40	170.67	0.00	0.00	0.00
Total Pounds Removed To Date, as gasoline:		153.7	324.3	324.3	324.3	324.3
Total Gallons Removed This Period, as gasoline (16):		9.58	27.53	0.00	0.00	0.00
Total Gallons Removed To Date, as gasoline:		24.8	52.3	52.3	52.3	52.3

Table 6
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 2035
Location: 1001 San Pablo Avenue
Albany, California

Consultant: EMCON
1921 Ringwood Avenue
San Jose, California

Vapor Treatment Unit: Therm Tech Model VAC-10 thermal/catalytic oxidizer

Start-Up Date: 12-07-93
Reporting Period From: 12-07-93
To: 01-01-96

Date Begin:		02-06-95	03-01-95	04-01-95	06-01-95	07-01-95
Date End:		03-01-95	04-01-95	06-01-95	07-01-95	08-01-95
Mode of Oxidation:		Therm-Ox	Therm-Ox	Therm-Ox	Cat-Ox (19)	Cat-Ox
Days of Operation:		20.91	6.78	0.13	4.68	25.60
Days of Downtime:		1.59	24.22	60.87	25.32	5.40
Average Vapor Concentrations (1)						
Well Field Influent:	ppmv (2) as gasoline (3)	1800	2500	NA	3300	130
	mg/m3 (4) as gasoline	6650	8900	NA	12000	480
	ppmv as benzene (5)	17	31	NA	50	4
	mg/m3 as benzene	62	99	NA	170	14
System Influent:	ppmv as gasoline	240	<15	NA	600	130
	mg/m3 as gasoline	880	<60	NA	2200	480
	ppmv as benzene	6	<0.1	NA	10	4
	mg/m3 as benzene	21	<0.5	NA	34	14
System Effluent:	ppmv as gasoline	<15	<15	NA	<15	<15
	mg/m3 as gasoline	<60	<60	NA	<60	<60
	ppmv as benzene	<0.1	<0.1	NA	0.5	<0.1
	mg/m3 as benzene	<0.5	<0.5	NA	1.5	<0.5
Average Well Field Flow Rate (6), scfm (7):		4.7	4.1	1.2	20.9	25.2
Average System Influent Flow Rate (6), scfm:		35.6	32.7	25.3	33.8	33.6
Average Destruction Efficiency (8), percent (9):		93.2	NA	NA	97.3	87.5
Average Emission Rates (10), pounds per day (11)						
Gasoline:		0.19	0.18	NA	0.18	0.18
Benzene:		0.00	0.00	NA	0.00	0.00
Operating Hours This Period:		501.95	162.83	3.02	112.33	614.38
Operating Hours To Date:		1248.9	1411.7	1414.7	1527.0	2141.4
SVE Pounds/ Hour Removal Rate, as gasoline (12):		0.12	0.14	0.00	0.94	0.05
SVE Pounds Removed This Period, as gasoline (13):		58.72	22.24	0.00	105.44	27.81
GWE Pounds Removed This Period, as gasoline (14):		4.28	0.31	0.00	1.42	0.00
Total Pounds Removed This Period, as gasoline (15):		63.00	22.55	0.00	106.86	27.81
Total Pounds Removed To Date, as gasoline:		387.3	409.9	409.9	516.8	544.6
Total Gallons Removed This Period, as gasoline (16):		10.16	3.64	0.00	17.24	4.49
Total Gallons Removed To Date, as gasoline:		62.5	66.1	66.1	83.4	87.8

Table 6
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 2035
Location: 1001 San Pablo Avenue
Albany, California

Consultant: EMCON
1921 Ringwood Avenue
San Jose, California

Vapor Treatment Unit: Therm Tech Model VAC-10 thermal/catalytic oxidizer

Start-Up Date: 12-07-93
Reporting Period From: 12-07-93
To: 01-01-96

Date Begin:		08-01-95	09-01-95	10-01-95	11-01-95	12-01-95
Date End:		09-01-95	10-01-95	11-01-95	12-01-95	01-01-96
Mode of Oxidation:		Cat-Ox	Cat-Ox	Cat-Ox	Cat-Ox	Cat-Ox
Days of Operation:		23.44	29.89	26.02	29.50	20.56
Days of Downtime:		7.56	0.11	4.98	0.50	10.44
Average Vapor Concentrations (1)						
Well Field Influent:	ppmv (2) as gasoline (3)	1850	617	425	850	940
	mg/m3 (4) as gasoline	7800	2233	1535	3100	3385
	ppmv as benzene (5)	17.5	5.9	4.7	11	7.4
	mg/m3 as benzene	56	19	15	36	23
System Influent:	ppmv as gasoline	1950	457	320	570	310
	mg/m3 as gasoline	8300	1667	1165	2100	1300
	ppmv as benzene	20	4.6	3.9	7	4.1
	mg/m3 as benzene	63	15	12	23	13
System Effluent:	ppmv as gasoline	54	<15	<15	<15	17
	mg/m3 as gasoline	155	<60	<60	<60	63
	ppmv as benzene	1	0.2	0.2	0.4	0.3
	mg/m3 as benzene	3.2	0.6	0.5	1.2	0.9
Average Well Field Flow Rate (6), scfm (7):		27.7	139.7	91.2	68.0	39.5
Average System Influent Flow Rate (6), scfm:		76.5	114.7	88.4	73.4	57.8
Average Destruction Efficiency (8), percent (9):		98.1	96.4	94.8	97.1	95.2
Average Emission Rates (10), pounds per day (11)						
Gasoline:		1.07	0.62	0.48	0.40	0.33
Benzene:		0.02	0.01	0.00	0.01	0.00
Operating Hours This Period:		562.61	717.42	624.47	708.09	493.54
Operating Hours To Date:		2704.0	3421.4	4045.9	4754.0	5247.5
SVE Pounds/ Hour Removal Rate, as gasoline (12):		0.81	1.17	0.52	0.79	0.50
SVE Pounds Removed This Period, as gasoline (13):		454.96	837.62	327.19	558.66	246.98
GWE Pounds Removed This Period, as gasoline (14):		0.49	0.24	0.07	11.02	5.51
Total Pounds Removed This Period, as gasoline (15):		455.45	837.86	327.26	569.68	252.49
Total Pounds Removed To Date, as gasoline:		1000.0	1837.9	2165.1	2734.8	2987.3
Total Gallons Removed This Period, as gasoline (16):		73.46	135.15	52.79	91.89	40.73
Total Gallons Removed To Date, as gasoline:		161.3	296.5	349.2	441.1	481.9

Table 6
Soil-Vapor Extraction System
Operation and Performance Data

Facility Number: 2035	Vapor Treatment Unit: Therm Tech Model VAC-10 thermal/catalytic oxidizer
Location: 1001 San Pablo Avenue, Albany, California	
Consultant: EMCON, 1921 Ringwood Avenue, San Jose, California	Start-Up Date: 12-07-93
	Reporting Period From: 12-07-93
	To: 01-01-96

CURRENT REPORTING PERIOD:	10-01-95	to 01-01-96
DAYS / HOURS IN PERIOD:	92.0	2208.0
DAYS / HOURS OF OPERATION:	76.1	1826.1
DAYS / HOURS OF DOWN TIME:	15.9	381.9
PERCENT OPERATIONAL:		82.7 %
PERIOD POUNDS REMOVED:	1149.4	
PERIOD GALLONS REMOVED:	185.4	
AVERAGE WELL FIELD FLOW RATE (scfm):		68.2
AVERAGE SYSTEM INFLUENT FLOW RATE (scfm):		74.3

1. Average vapor monitoring concentrations were calculated for all periods after February 6, 1995. 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. Between December 7, 1993, and February 6, 1995:
   Concentration (as gasoline in ppmv) = [concentration (as gasoline in mg/m3) x 24.05 (lb/m3/lb-mole of air)/mg] / 87 lb/lb-mole
4. mg/m3: milligrams per cubic meter
5. Between December 7, 1993, and February 6, 1995:
   Concentration (as benzene in ppmv) = [concentration (as benzene in mg/m3) x 24.05 (lb/m3/lb-mole of air)/mg] / 78 lb/lb-mole
6. Average flow rates (time weighted average) are based on instantaneous flow rates recorded during the month; refer to Appendix C for instantaneous flow data.
7. scfm: flow in standard cubic feet per minute at one atmosphere and 70 degrees Fahrenheit
8. Average destruction efficiencies are calculated using monthly average concentrations; refer to Appendix C for instantaneous destruction efficiency data.
9. 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
10. Average emission rates are calculated using monthly average concentrations and flow rates; refer to Appendix C for instantaneous emission rate data.
11. 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
12. 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
13. Soil-vapor extraction (SVE) pounds removed this period (as gasoline) = pounds/ hour removal rate (SVE) x hours of operation (SVE)
14. Groundwater extraction (GWE); refer to Table 9 for GWE system performance data
15. Represents the total mass recovered by the SVE and GWE systems, and the total mass abated by the thermal/catalytic oxidizer
16. gallons removed this period (as gasoline) = pounds removed this period (as gasoline) x 0.1613 gallons/pound of gasoline
17. Therm-Ox: thermal oxidation
18. NA: not analyzed, not applicable, or not available
19. Cat-Ox: catalytic oxidation; the SVE system's abatement unit was converted to the Cat-Ox mode of operation on June 20, 1995

Table 7
Soil-Vapor Extraction Well Data

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 03-19-96

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
For SVE well monitoring data prior to January 1, 1995, please refer to the third quarter 1995 groundwater monitoring report for this site.												
02-08-95	open	<17 LAB	20.0	open	<17 LAB	20.0	open	0.0 PID	20.0	open	0.0 PID	20.0
02-14-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
02-15-95	open	NA	11.0	open	NA	NA	open	NA	NA	open	NA	NA
03-08-95	open	NA	28.0	closed	NA	17.0	closed	NA	0.0	closed	NA	26.0
03-08-95	closed	NA	NA	closed	NA	NA	closed	NA	NA	closed	NA	NA
06-20-95	open	NA	9.0	open	NA	10.0	closed	NA	NA	closed	NA	NA
06-26-95	open	59000 LAB	17.0	open	56000 LAB	15.0	closed	NA	0.0	closed	NA	14.0
07-10-95	open	NA	NA	open	NA	NA	closed	NA	NA	closed	NA	NA
08-08-95	open	NA	47.0	open	NA	46.0	open	NA	47.0	open	NA	47.0
09-12-95	open	3390 PID	26.7	open	2332 PID	26.5	open	263 PID	25.0	open	1736 PID	26.3
09-28-95	open	1498 PID	30.0	open	1075 PID	29.0	open	235 PID	26.0	open	911 PID	30.0
09-28-95	open	1800 LAB	NA	open	1500 LAB	NA	open	180 LAB	NA	open	990 LAB	NA
09-28-95	open	NA	NA	open	NA	NA	closed	NA	NA	open	NA	NA
09-29-95	open	NA	NA	open	NA	NA	closed	NA	NA	open	NA	NA
10-26-95	open	NA	25.5	open	NA	25.5	closed	NA	0.0	open	NA	25.3
12-05-95	open	NA	54.0	open	NA	54.0	closed	NA	NA	closed	NA	NA

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

Table 7
Soil-Vapor Extraction Well Data

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 03-19-96

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
For SVE well monitoring data prior to January 1, 1995, please refer to the third quarter 1995 groundwater monitoring report for this site.												
02-08-95	open	0.0 PID	24.0	open	<17 LAB	10.0	open	0.0 PID	24.0	open	<17 LAB	20.0
02-14-95	open	NA	NA	closed	NA	NA	open	NA	NA	open	NA	NA
02-15-95	open	NA	NA	closed	NA	16.0	open	NA	NA	open	NA	NA
03-08-95	closed	NA	1.0	closed	NA	8.0	closed	NA	22.0	closed	NA	0.0
03-08-95	closed	NA	NA	open	NA	NA	closed	NA	NA	closed	NA	NA
06-20-95	closed	NA	NA	closed	NA	NA	closed	NA	NA	closed	NA	NA
06-26-95	closed	NA	7.0	closed	NA	34.0	closed	NA	16.0	closed	NA	2.0
07-10-95	closed	NA	NA	closed	NA	NA	closed	NA	NA	closed	NA	NA
08-08-95	open	NA	46.0	open	NA	36.0	open	NA	47.0	open	NA	43.0
09-12-95	open	243 PID	26.2	open	587 PID	27.7	open	1297 PID	25.5	open	830 PID	26.2
09-28-95	open	301 PID	30.0	open	230 PID	32.0	open	941 PID	30.0	open	956 PID	29.0
09-28-95	open	280 LAB	NA	open	250 LAB	NA	open	1400 LAB	NA	open	2000 LAB	NA
09-28-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
09-29-95	open	NA	NA	closed	NA	NA	open	NA	NA	open	NA	NA
10-26-95	open	NA	25.3	closed	NA	0.0	open	NA	19.0	open	NA	21.9
12-05-95	closed	NA	NA	closed	NA	NA	open	NA	54.0	closed	NA	NA

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

Table 7
Soil-Vapor Extraction Well Data

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 03-19-96

Date	Well Identification											
	VW-9			RW-1			AS-1V			AS-2V		
	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
For SVE well monitoring data prior to January 1, 1995, please refer to the third quarter 1995 groundwater monitoring report for this site.												
02-08-95	open	0.0 PID	23.0	open	13.7 PID	20.0	open	<17 LAB	24.0	open	<17 LAB	24.0
02-14-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
02-15-95	open	NA	NA	open	NA	13.0	passive	NA	5.0	passive	NA	1.0
03-08-95	closed	NA	8.0	open	NA	28.0	passive	NA	0.0	passive	NA	0.0
03-08-95	closed	NA	NA	closed	NA	NA	open	NA	NA	open	NA	NA
06-20-95	closed	NA	NA	open	NA	10.0	open	NA	10.0	open	NA	10.0
06-26-95	closed	NA	8.0	open	4800 LAB	19.0	open	40000 LAB	15.0	open	40000 LAB	15.0
07-10-95	closed	NA	NA	open(b)	NA	NA	open	NA	NA	open	NA	NA
08-08-95	open	NA	44.5	open	NA	49.0	open	NA	44.5	open	NA	44.5
09-12-95	open	566 PID	25.3	open	1072 PID	26.3	open	2522 PID	26.6	open	2522 PID	26.6
09-28-95	open	393 PID	25.0	open	921 PID	31.0	open	1213 PID	26.5	open	1183 PID	26.0
09-28-95	open	500 LAB	NA	open	1100 LAB	NA	open	1400 LAB	NA	open	1500 LAB	NA
09-28-95	open	NA	NA	open	NA	NA	open	NA	NA	closed	NA	NA
09-29-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
10-26-95	open	NA	22.4	open	NA	23.9	open	NA	25.7	open	NA	25.7
12-05-95	closed	NA	NA	closed	NA	NA	open	NA	54.0	closed	NA	NA

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

Table 8
Influent and Effluent Groundwater Analyses

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 03-19-96

Well Designation	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
I-1	02-08-95	NA	NA	NA	NA	NA
I-1	02-08-95	49000	4300	4900	1000	5200
I-1	02-14-95	33000	4300	5800	970	5600
I-1	02-21-95	21000	940	1500	360	4000
I-1	02-28-95	15000	430	290	54	2000
I-1	03-08-95	15000	430	290	54	2000
I-1	06-20-95	20000	1500	1200	220	2300
I-1	08-08-95	11000	970	1100	210	1800
I-1	09-12-95	2700	200	150	29	290
I-1	10-11-95	1000	97	38	7	69
I-1	11-08-95	2500	38	27	8	240
I-1	11-30-95	29000	190	530	300	3100
I-2	02-08-95	NA	NA	NA	NA	NA
I-2	02-08-95	1500	59	70	14	86
I-2	02-14-95	1500	59	70	14	86
I-2	02-21-95	340	7.2	8.8	1.9	37
I-2	02-28-95	390	3.9	2.5	0.9	16
I-2	03-08-95	390	3.9	2.5	0.9	16
I-2	06-20-95	2200	30	27	11	77
I-2	08-08-95	330	17	18	3.5	36
I-2	09-12-95	78	4.1	3	<0.5	8.9
I-2	10-11-95	<50	0.9	<0.5	<0.5	1
I-2	11-08-95	1800	2.5	2.7	3.8	35
I-2	11-30-95	220	5	7.4	1.7	22

Table 8
Influent and Effluent Groundwater Analyses

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 03-19-96

Well Designation	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
I-3	02-08-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	02-14-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	02-21-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	02-28-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	06-20-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	08-08-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	09-12-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	10-11-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	11-08-95	<50	<0.5	<0.5	<0.5	<0.5
I-3	11-30-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	02-08-95	<50	0.7	<0.5	<0.5	<0.5
E-1	02-14-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	02-21-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	02-28-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	06-20-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	08-08-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	09-12-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	10-11-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	11-08-95	<50	<0.5	<0.5	<0.5	<0.5
E-1	11-30-95	<50	<0.5	<0.5	<0.5	<0.5

TPHG: total petroleum hydrocarbons as gasoline
µg/L: micrograms per liter
NA: not analyzed

Table 9
Estimated Total Dissolved TPHG Removed

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 03-25-96

Sample Desig-nation	Sample Date	Groundwater Extraction			TPHG Removal Data					Benzene Removal Data				
		Total Volume Extracted	Period Volume Extracted	Period Flow Rate	Period Influent Concentration	Period Removal Rate	Period Pounds Removed [1]	Total Pounds Removed	Total Gallons Removed [2]	Period Influent Concentration	Period Removal Rate	Period Pounds Removed [3]	Total Pounds Removed	Total Gallons Removed [4]
		gallons	gallons	gpd	µg/L	lbs/day	pounds	pounds	gallons	µg/L	lbs/day	pounds	pounds	gallons
I-1	02-08-95	628	0	0	NA	0.000	0.000	0.000	0.000	NA	0.0000	0.0000	0.0000	0.0000
I-1	02-08-95	880	252	2,520	49,000	1.031	0.103	0.103	0.017	4,300	0.0904	0.0090	0.0090	0.0012
I-1	02-14-95	1,329	449	76	33,000	0.021	0.124	0.227	0.037	4,300	0.0027	0.0161	0.0251	0.0035
I-1	02-21-95	15,499	14,170	2,051	21,000	0.360	2.484	2.710	0.437	940	0.0161	0.1112	0.1363	0.0188
I-1	02-28-95	28,788	13,289	1,894	15,000	0.237	1.664	4.374	0.706	430	0.0068	0.0477	0.1840	0.0254
I-1	03-08-95	31,358	2,570	316	15,000	0.040	0.322	4.696	0.757	430	0.0011	0.0092	0.1932	0.0266
I-1	06-20-95	31,695	337	3	20,000	0.001	0.056	4.752	0.767	1,500	0.0000	0.0042	0.1975	0.0272
I-1	06-30-95	40,933	9,238	924	20,000	0.154	1.542	6.294	1.015	1,500	0.0116	0.1157	0.3131	0.0432
I-1	08-08-95	46,416	5,483	141	11,000	0.013	0.503	6.798	1.097	970	0.0011	0.0444	0.3575	0.0493
I-1	09-12-95	57,434	11,018	315	2,700	0.007	0.248	7.046	1.137	200	0.0005	0.0184	0.3759	0.0518
I-1	10-11-95	66,534	9,100	314	1,000	0.003	0.076	7.122	1.149	97	0.0003	0.0074	0.3833	0.0529
I-1	11-08-95	106,654	40,120	1,433	2,500	0.030	0.837	7.959	1.284	38	0.0005	0.0127	0.3960	0.0546
I-1	11-30-95	151,566	44,912	2,041	29,000	0.494	10.871	18.831	3.037	190	0.0032	0.0712	0.4672	0.0644
I-1 (6)	12-22-95	174,511	22,945	1,043	29,000	0.252	5.554	24.385	3.933	190	0.0017	0.0364	0.5036	0.0695

Table 9
Estimated Total Dissolved TPHG Removed

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

Date: 03-25-96

Sample Desig-nation	Sample Date	Groundwater Extraction			TPHG Removal Data					Benzene Removal Data				
		Total Volume Extracted	Period Volume Extracted	Period Flow Rate	Period Influent Concentration	Period Removal Rate	Period Pounds Removed [1]	Total Pounds Removed	Total Gallons Removed [2]	Period Influent Concentration	Period Removal Rate	Period Pounds Removed [3]	Total Pounds Removed	Total Gallons Removed [4]
		gallons	gallons	gpd	µg/L	lbs/day	pounds	pounds	gallons	µg/L	lbs/day	pounds	pounds	gallons
I-2	02-08-95	628	0	0	NA	0.000	0.000	0.000	0.000	NA	0.0000	0.0000	0.0000	0.0000
I-2	02-08-95	880	252	2,520	1,500	0.032	0.003	0.003	0.001	59	0.0012	0.0001	0.0001	0.0000
I-2	02-14-95	1,329	449	85	1,500	0.001	0.006	0.009	0.001	59	0.0000	0.0002	0.0003	0.0000
I-2	02-21-95	15,499	14,170	2,024	340	0.006	0.040	0.049	0.008	7	0.0001	0.0009	0.0012	0.0002
I-2	02-28-95	28,788	13,289	1,898	390	0.006	0.043	0.092	0.015	4	0.0001	0.0004	0.0016	0.0002
I-2	03-08-95	31,358	2,570	321	390	0.001	0.008	0.101	0.016	4	0.0000	0.0001	0.0017	0.0002
I-2	06-20-95	31,695	337	3	2,200	0.000	0.006	0.107	0.017	30	0.0000	0.0001	0.0018	0.0002
I-2	06-30-95	40,933	9,238	924	2,200	0.017	0.170	0.276	0.045	30	0.0002	0.0023	0.0041	0.0006
I-2	08-08-95	46,416	5,483	141	330	0.000	0.015	0.292	0.047	17	0.0000	0.0008	0.0049	0.0007
I-2	09-12-95	57,434	11,018	315	78	0.000	0.007	0.299	0.048	4	0.0000	0.0004	0.0053	0.0007
I-2	10-11-95	66,534	9,100	314	<50	0.000	0.004	0.303	0.049	1	0.0000	0.0001	0.0053	0.0007
I-2	11-08-95	106,654	40,120	1,433	1,800	0.022	0.603	0.905	0.146	3	0.0000	0.0008	0.0062	0.0009
I-2	11-30-95	151,566	44,912	2,041	220	0.004	0.082	0.988	0.159	5	0.0001	0.0019	0.0080	0.0011
I-2 (6)	12-22-95	174,511	22,945	1,043	220	0.002	0.042	1.030	0.166	5	0.0000	0.0010	0.0090	0.0012

Table 9
Estimated Total Dissolved TPHG Removed

ARCO Service Station 2035
1001 San Pablo Avenue, Albany, California

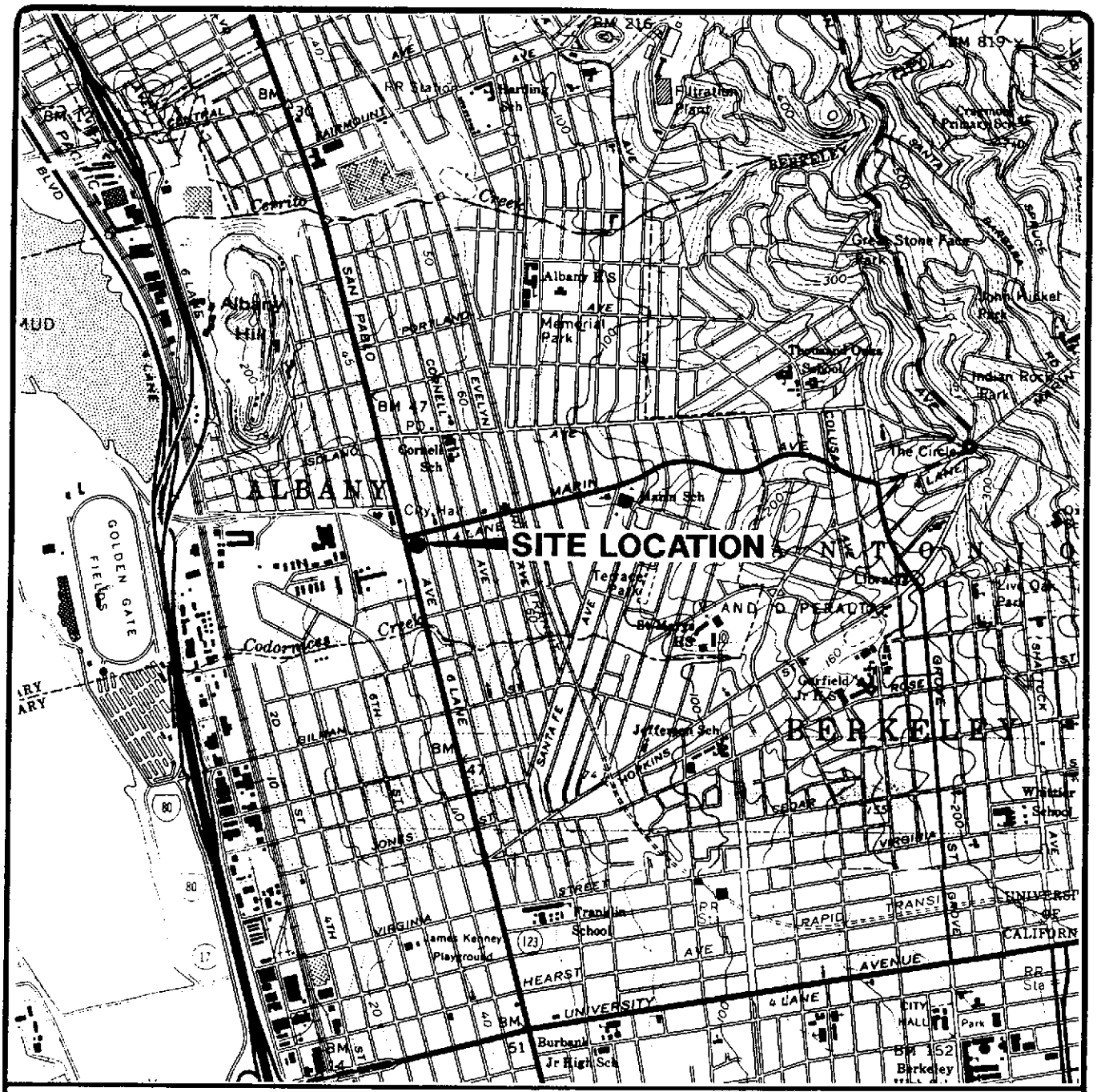
Date: 03-25-96

Sample Designation	Sample Date	Groundwater Extraction: Total Volume Extracted (gallons)	Groundwater Extraction: Period Volume Extracted (gallons)	Groundwater Extraction: Period Flow Rate (gpd)	TPHG Removal Data: Period Influent Concentration (µg/L)	TPHG Removal Data: Period Removal Rate (lbs/day)	TPHG Removal Data: Period Pounds Removed [1] (pounds)	TPHG Removal Data: Total Pounds Removed (pounds)	TPHG Removal Data: Total Gallons Removed [2] (gallons)	Benzene Removal Data: Period Influent Concentration (µg/L)	Benzene Removal Data: Period Removal Rate (lbs/day)	Benzene Removal Data: Period Pounds Removed [3] (pounds)	Benzene Removal Data: Total Pounds Removed (pounds)	Benzene Removal Data: Total Gallons Removed [4] (gallons)
CURRENT REPORTING PERIOD:	10-11-95	to	12-22-95											
DAYS / HOURS IN PERIOD:		71.9	1,724.7											
DAYS / HOURS OF OPERATION:		45.7	1,096.0											
DAYS / HOURS OF DOWN TIME:		26.2	628.7											
PERCENT OPERATIONAL:			64%											
PERIOD GROUNDWATER EXTRACTED (gallons):						107,977								
PERIOD HYDROCARBON REMOVAL (TOTAL):						17.262	pounds	2.784	gallons		0.1203	pounds	0.0166	gallons
HYDROCARBONS REMOVED BY AERATION TANK:						16.535	pounds	2.667	gallons		0.1167	pounds	0.0161	gallons
HYDROCARBONS REMOVED BY CARBON:						0.727	pounds	0.117	gallons		0.0037	pounds	0.0005	gallons
PERCENT PRIMARY CARBON LOADING: [5]						10%								
PERIOD AVERAGE FLOW RATE (gpd):						1,503	(includes down time)							
PERIOD AVERAGE FLOW RATE (gpd):						2,364	(excludes down time)							
PERIOD AVERAGE FLOW RATE (gpm):						1.6	(excludes down time)							

TPHG: total petroleum hydrocarbons as gasoline
gpd: gallons per day
µg/L: micrograms per liter
lbs/day: pounds per day
NA: not analyzed
gpm: gallons per minute

1. Period TPHG removed (pounds) = period influent TPHG concentration (µg/L) x period volume of groundwater extracted (gallons) x 3.7854 (liters/gallon) x 0.000000002205 (pounds/µg)
2. Total TPHG removed (gallons) = total TPHG removed (pounds) x 0.1613 (gallons/pound)
3. Period benzene removed (pounds) = period influent benzene concentration (µg/L) x period volume of groundwater extracted (gallons) x 3.7854 (liters/gallon) x 0.000000002205 (pounds/µg)
4. Total benzene removed (gallons) = total benzene removed (pounds) x 0.1379 (gallons/pound)
5. Percent carbon loading = (total TPHG removed (1.030 pounds) / 10 pounds of TPH-G) x 100
   The percent carbon loading calculation assumes a 5% by weight carbon adsorption efficiency. The treatment system uses two 200 pound carbon canisters.
   Carbon Loading (10 lbs TPHG) = 1 canister x 200 lbs carbon/canister x 1 lb TPHG/20 lb carbon
6. Assumption that the BTEX and TPHG concentrations in the groundwater treatment system samples are the same as the previous sampling event on 11-30-95. System sampling schedule was reduced from monthly to quarterly by EBMUD during the third quarter 1995, therefore samples were not collected in December 1995.

152753



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

Scale : 0 2000 4000 Feet

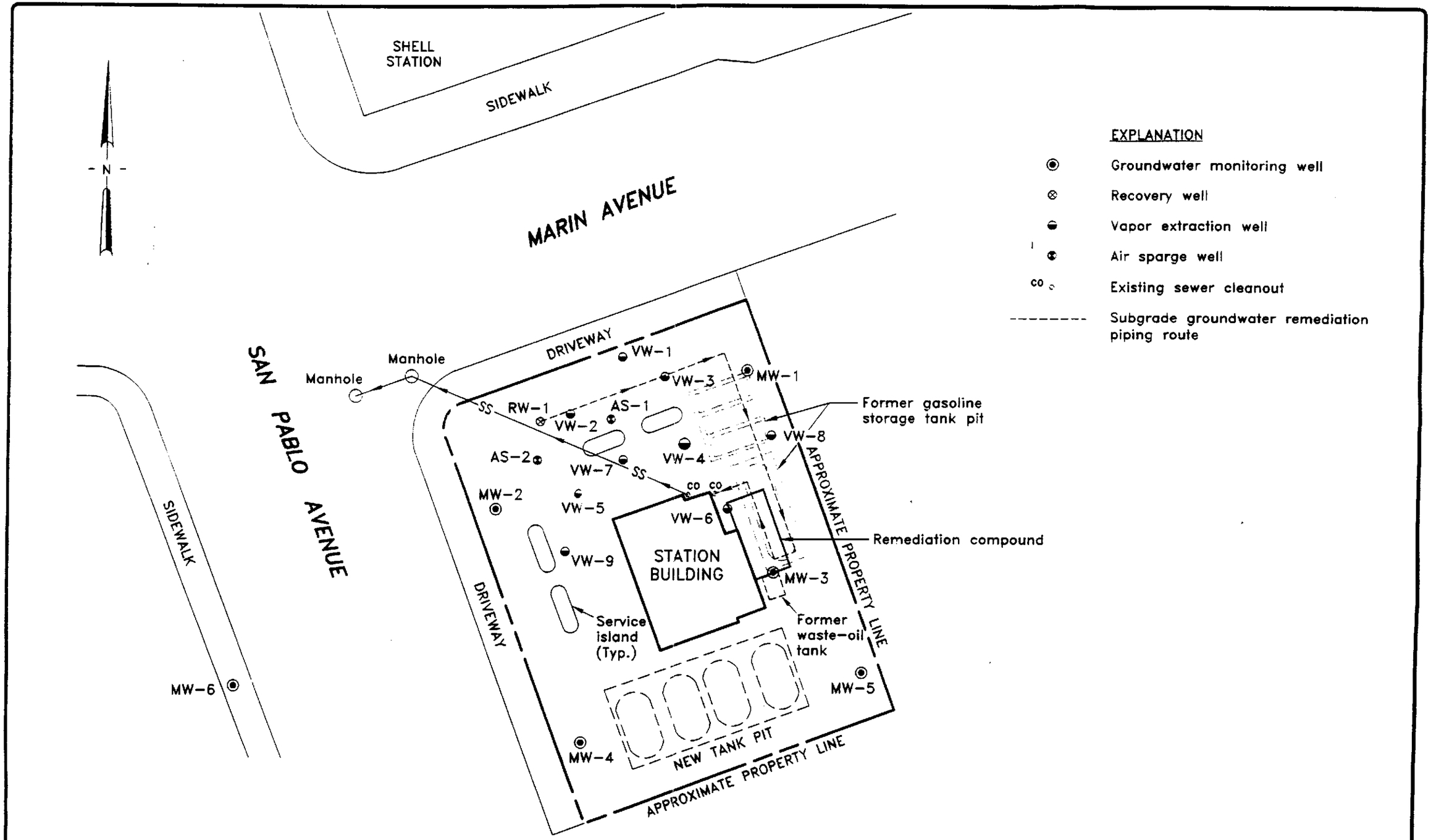
- N -

EMCON

ARCO PRODUCTS COMPANY
SERVICE STATION 2035, 1001 SAN PABLO AVENUE
QUARTERLY GROUNDWATER MONITORING
ALBANY, CALIFORNIA

SITE LOCATION

FIGURE
1
PROJECT NO.
805-123.02



EMCON

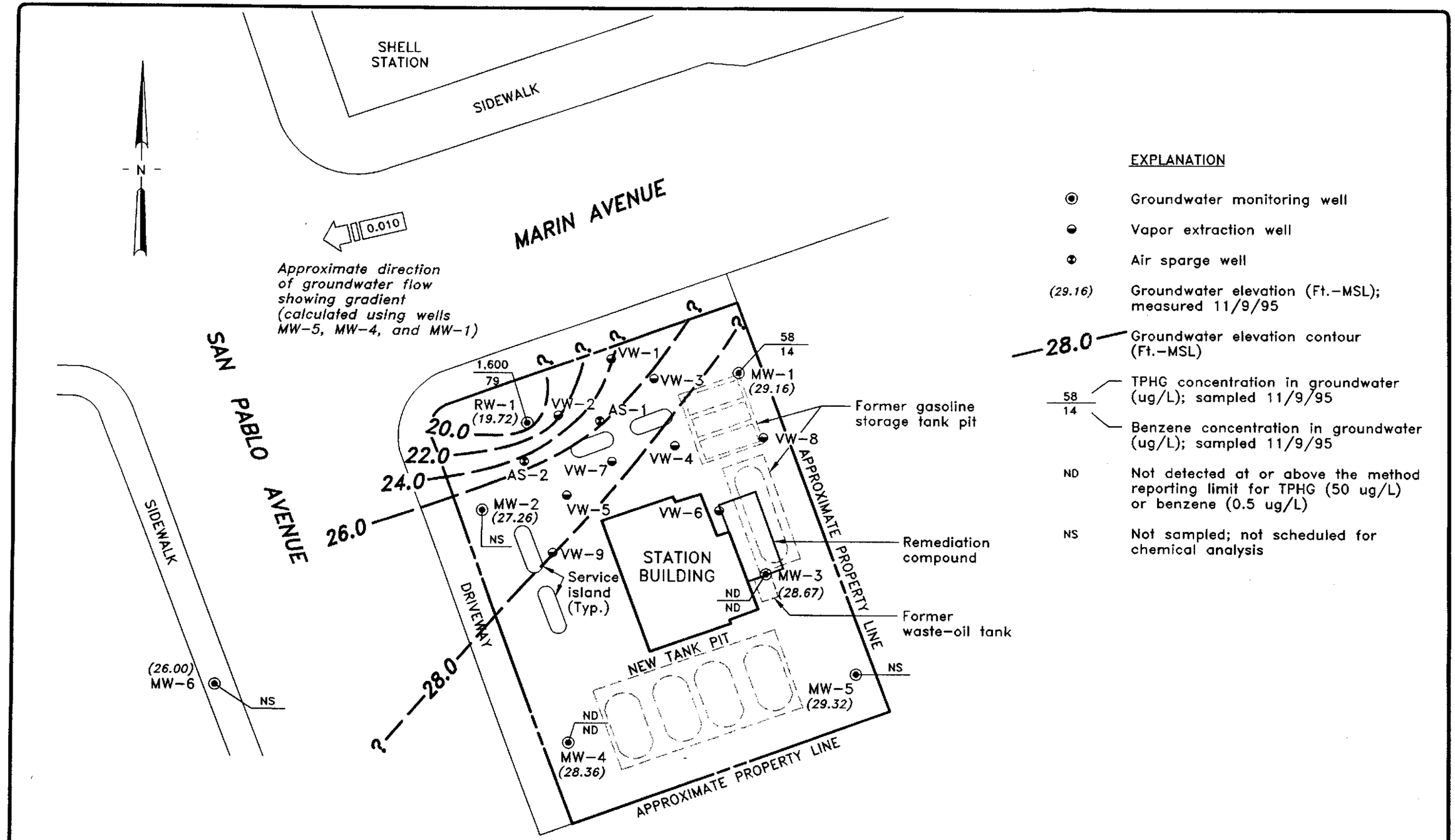
SCALE: 0 30 60 FEET

ARCO PRODUCTS COMPANY
SERVICE STATION 2035, 1001 SAN PABLO AVENUE
QUARTERLY GROUNDWATER MONITORING
ALBANY, CALIFORNIA

SITE PLAN

FIGURE NO.
2

PROJECT NO.
805-123.02



EMCON

SCALE: 0 30 60 FEET

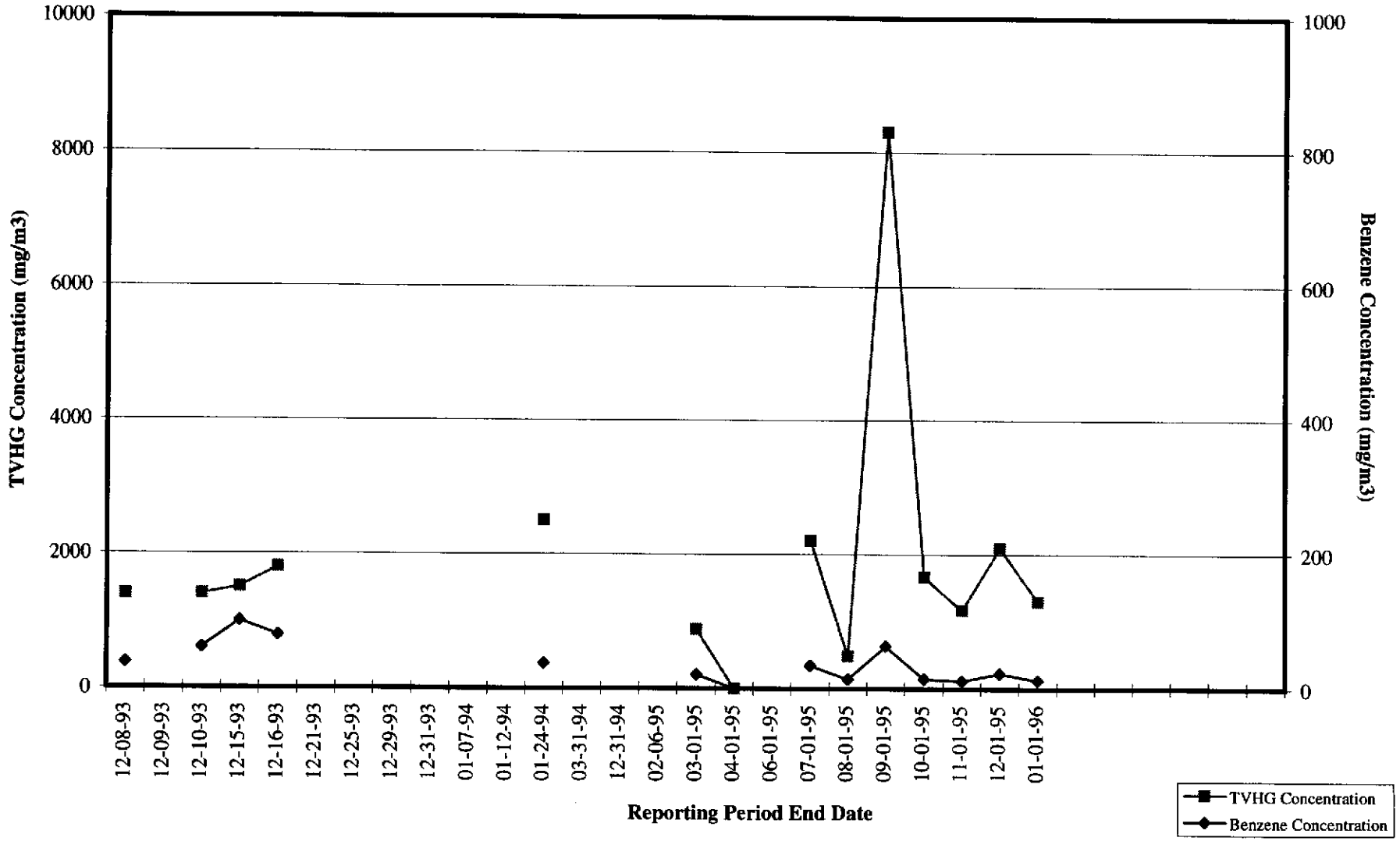
ARCO PRODUCTS COMPANY
SERVICE STATION 2035, 1001 SAN PABLO AVENUE
QUARTERLY GROUNDWATER MONITORING
ALBANY, CALIFORNIA

GROUNDWATER DATA
FOURTH QUARTER 1995

FIGURE NO.
3
PROJECT NO.
805-123.02

Figure 4

ARCO Service Station 2035
Soil-Vapor Extraction and Treatment System
Historical System Influent TVHG and Benzene Concentrations

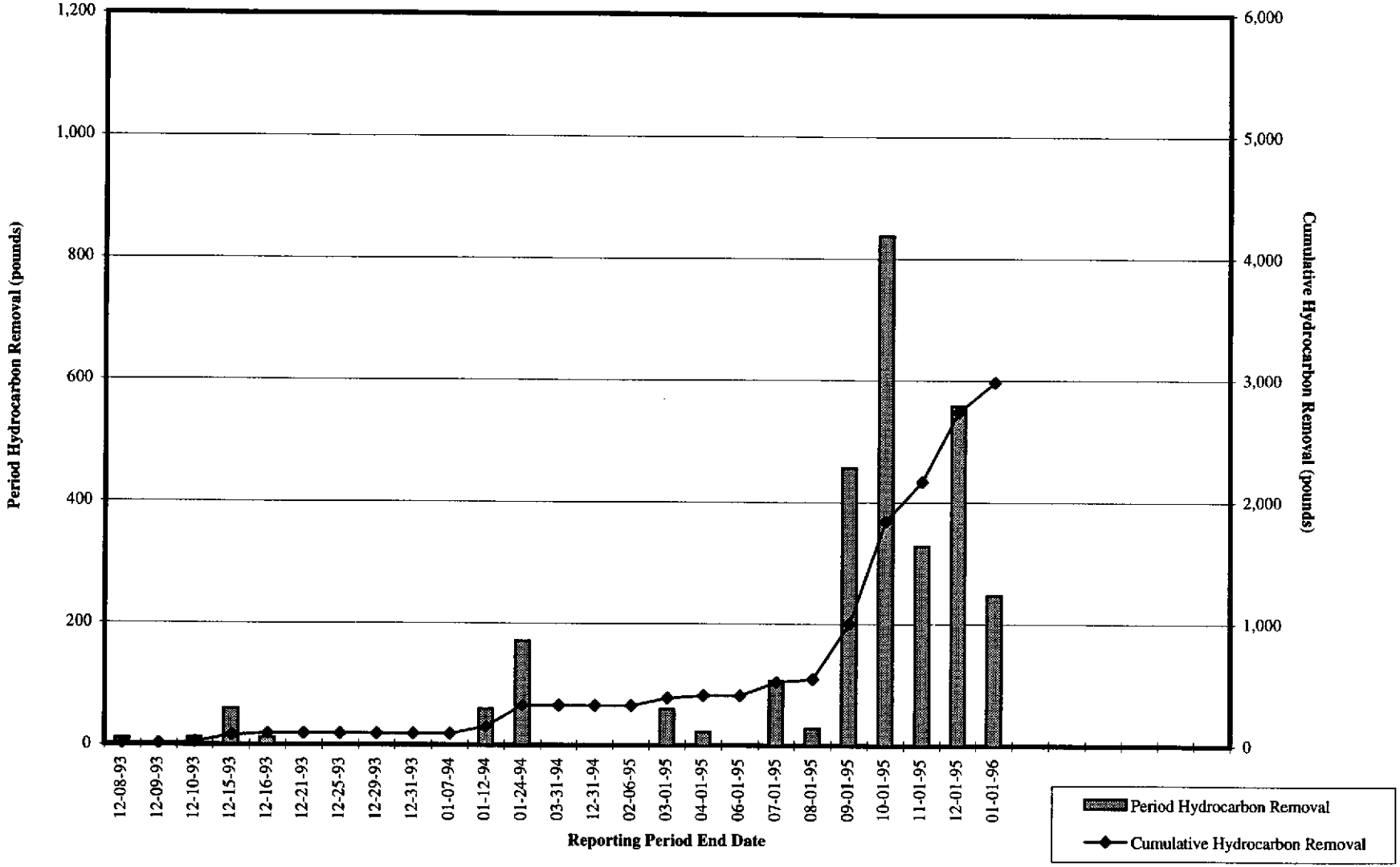


TVHG = total volatile hydrocarbons as gasoline
mg/m3 = milligrams per cubic meter

esj/h:\2035\2035tdb.xls\SVE Model:dcl
20805-123.002

Figure 5

ARCO Service Station 2035
Soil-Vapor Extraction and Treatment System
Historical Hydrocarbon Removal Rates



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20805-123.002

APPENDIX A

FIELD DATA SHEETS, FOURTH QUARTER 1995 GROUNDWATER MONITORING EVENT

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 1775-217.01 STATION ADDRESS : 101 San Pablo Avenue DATE : 11-9-95

ARCO STATION # : 2035 FIELD TECHNICIAN : M. Ross DAY : Thursday

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-2**	OK	Yes	Yes	Yes	Yes	13.12	13.12	NA	NA	28.7	
2	**MW-3**	OK	Yes	Yes	Yes	Yes	12.77	12.77	NA	NA	33.0	
3	**MW-5**	OK	Yes	Yes	Yes	Yes	12.52	12.52	NA	NA	24.4	
4	**MW-6**	OK	Yes	Yes	Yes	Yes	14.13	14.13	NA	NA	24.3	
5	**MW-4**	OK	Yes	Yes	Yes	Yes	11.97	11.97	NA	NA	25.1	
6	**MW-1**	OK	~~Yes~~	~~Yes~~	Yes	Yes	12.25	12.25	NA	NA	29.7	
7	**RW-1**	Yes	Yes	NO	NO	NO	20.61	20.61	~~21.~~ NA	NA	25.4	

SURVEY POINTS ARE TOP OF WELL CASINGS

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-217.01 SAMPLE ID: MW-1

PURGED BY: M. ROSS CLIENT NAME: ARCO 2035

SAMPLED BY: M. ROSS LOCATION: ALBANY, 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.):	11.40
DEPTH TO WATER (feet):	12.25	CALCULATED PURGE (gal.):	34.20
DEPTH OF WELL (feet):	29.7	ACTUAL PURGE VOL. (gal.):	34.5

DATE PURGED: 11-9-95 Start (2400 Hr) ~~1145~~ 1243 End (2400 Hr) 1255

DATE SAMPLED: 11-9-95 Start (2400 Hr) 1310 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
~~1246~~	11.5	6.31	697	69.4	LIGHT BRN	MOD
1250	23.0	6.30	755	69.0	CLR	TRACE
1255	34.5	6.33	791	68.7	"	"

D. O. (ppm): NA ODOR: NONE

COLOR: NA (COBALT 0 - 500)

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

Field QC samples collected at this well: NA

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: GOOD LOCK #: ARCO

REMARKS: ___

Meter Calibration: Date: 11-9-95 Time: 1035 Meter Serial #: 9210 Temperature °F: ___

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

Location of previous calibration: RW-1

Signature: Mike Ross Reviewed By: SKF Page 1 of 4

Rev. 3, 2/94
1.96

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-217.01 SAMPLE ID: MW-3
PURGED BY: M. ROSS CLIENT NAME: ARCO 2035
SAMPLED BY: M. ROSS LOCATION: ALBANY, 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.): 13.21
DEPTH TO WATER (feet): 12.77 CALCULATED PURGE (gal.): 39.65
DEPTH OF WELL (feet): 33.0 ACTUAL PURGE VOL. (gal.): 40.0

DATE PURGED: 11-9-95 Start (2400 Hr) 1118 End (2400 Hr) 1136
DATE SAMPLED: 11-9-95 Start (2400 Hr) 1150 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1120	13.5	6.45	737	66.1	BRN	HEAVY
1128	27.0	6.47	697	67.9	"	"
1136	40.0	6.53	650	68.1	"	"

D. O. (ppm): NA ODOR: NONE

COLOR (COBALT 0 - 500): NA
TURBIDITY (NTU 0 - 200 or 0 - 1000): NA

Field QC samples collected at this well: NA

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: GOOD LOCK #: ARCO

REMARKS: ___

Meter Calibration: Date: 11-9-95 Time: 1035 Meter Serial #: 9210 Temperature °F: ___

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

Location of previous calibration: RW-1

Signature: [signature] Reviewed By: [signature] Page 2 of 4

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-217.01 SAMPLE ID: MW-4

PURGED BY: M. ROSS CLIENT NAME: ARCO 2035

SAMPLED BY: M. ROSS LOCATION: ALBANY, 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.): 8.57

DEPTH TO WATER (feet): 11.97 CALCULATED PURGE (gal.): 25.73

DEPTH OF WELL (feet): 25.1 ACTUAL PURGE VOL. (gal.): 23.0

DATE PURGED: 11-9-95 Start (2400 Hr) 1203 End (2400 Hr) 1213

DATE SAMPLED: 11-9-95 Start (2400 Hr) 1230 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1205	9.0	6.49	430	70.1	Light Brn	Mod
1209	17.5	6.26	6.11	70.3	11	11
1213	~~26.0~~	DRY	at 23.0	GALLONS		
1225	DTW → 17.45					
1234	Recharge	6.36	565	69.1	Light Brn	Mod

D. O. (ppm): NA ODOR: NONE

COLOR (visual): N/A (COBALT 0 - 500)

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

Field QC samples collected at this well: NA

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: GOOD LOCK #: ARCO

REMARKS: ___

Meter Calibration: Date: 11-9-95 Time: 1035 Meter Serial #: 9210 Temperature °F: ___

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

Location of previous calibration: RW-1

Signature: [signature] Reviewed By: SJ Page 3 of 4

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-217.01 SAMPLE ID: RW-1

PURGED BY: M. ROSS CLIENT NAME: ARCO 2035

SAMPLED BY: M. ROSS LOCATION: ALBANY, 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.): NA

DEPTH TO WATER (feet): NA CALCULATED PURGE (gal.): NA

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

DATE PURGED: NA Start (2400 Hr) NA End (2400 Hr) NA

DATE SAMPLED: 11-9-95 Start (2400 Hr) 1045 End (2400 Hr) ~~1050~~

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1040	GRAB SAMPLE	6.48	790	71.3	clr	clr

D. O. (ppm): NA ODOR: NONE

COLOR (COBALT 0 - 500): NA

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

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: NA

SAMPLING EQUIPMENT

___ 2" Bladder Pump ___ Bailer (Teflon®)

___ DDL Sampler ___ Bailer (Stainless Steel)

___ Dipper ___ Submersible Pump

___ Well Wizard™ ✓ Dedicated

Other: NA

WELL INTEGRITY: GOOD LOCK #: NONE

REMARKS: ___

Meter Calibration: Date: 11-9-95 Time: 1035 Meter Serial #: 9210 Temperature °F: 72.8

(EC 1000 1017 / 1000) (DI ___) (pH 7 704 / 700) (pH 10 1004 / 1000) (pH 4 399 / ___)

Location of previous calibration: ___

Signature: Mike Ross Reviewed By: SO Page 4 of 4

APPENDIX B

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

Columbia Analytical Services inc.

December 4, 1995

Service Request No: S951413

John Young
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

Re: **0805-123.002 / TO# 17075.00 / 2035 Albany**

Dear Mr. Young:

The following pages contain analytical results for sample(s) received by the laboratory on November 09, 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 12, 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:	EMCON	**Service Request:**	S951413
Project:	ARCO Products Company #2035/#0805-123.002	**Date Collected:**	11/9/95
Sample Matrix:	Water	**Date Received:**	11/9/95
		Date Extracted:	NA
		Date Analyzed:	11/16,17/95

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

Analyte:	**TPH as Gasoline**	**Benzene**	**Toluene**	**Ethyl-benzene**	**Xylenes, Total**
Units:	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
Method Reporting Limit:	50	0.5	0.5	0.5	0.5
Sample Name	**Lab Code**				
MW-3 (33)	S951413-001	ND	ND	ND	ND	ND
MW-4 (25)	S951413-002	ND	ND	ND	ND	ND
MW-1 (29)	S951413-003	58	14	ND	ND	ND
RW-1 (25)	S951413-004	1,600	79	46	13	240
Method Blank	S951115-WMB	ND	ND	ND	ND	ND
Method Blank	S951117-WMB	ND	ND	ND	ND	ND

5ABTXGAS/061694

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Products Company #2035/#0805-123.002
Sample Matrix: Water

Service Request: L9504006
Date Collected: 11/9/95
Date Received: 11/9/95
Date Extracted: 11/14/95
Date Analyzed: 11/14/95

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

Sample Name	Lab Code	MRL	Result
MW-3(33)	L9504006-001	0.5	0.6
Method Blank	L9504006-MB	0.5	ND

1AMRL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Products Company #2035/#0805-123.002
Sample Matrix: Water

Service Request: S951413
Date Collected: 11/9/95
Date Received: 11/9/95
Date Extracted: NA

Volatile Organic Compounds
EPA Method 8240
Units: ug/L (ppb)

		Sample Name:	**MW-4 (25)**	**Method Blank**
		Lab Code:	S951413-002	S951115-WMB
		Date Analyzed:	11/13/95	11/13/95
Analyte	**MRL**			
Methyl-tert-butyl ether	1		89	ND

3S44/060194

APPENDIX A

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Products Company #2035/#0805-123.002
Sample Matrix: Water

Service Request: S951413
Date Collected: 11/9/95
Date Received: 11/9/95
Date Extracted: NA
Date Analyzed: 11/16,17/95

Surrogate Recovery Summary
BTEX 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-3 (33)	S951413-001	92	97
MW-4 (25)	S951413-002	90	96
MW-1 (29)	S951413-003	91	99
RW-1 (25)	S951413-004	90	100
Batch QC (MS)	S951385-009MS	95	108
Batch QC (DMS)	S951385-009DMS	96	105
Method Blank	S951115-WMB	90	104
Method Blank	S951117-WMB	91	97
CAS Acceptance Limits:		69-116	69-116

SUR2/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:
Project:
Sample Matrix: Water

Service Request: S951413
Date Collected: 11/9/95
Date Received: 11/9/95
Date Extracted: NA
Date Analyzed: 11/15/95

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: S951385-009

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Gasoline	5,000	5,000	3,200	8,070	7,990	97	96	67-121	1

DMS1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Products Company #2035/#0805-123.002

Service Request: S951413
Date Analyzed: 11/15/95

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

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	22.9	92	85-115
Toluene	25	23.2	93	85-115
Ethylbenzene	25	22.5	90	85-115
Xylenes, Total	75	70.1	93	85-115
Gasoline	250	254	102	90-110

ICV25AL/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	L9504006
Project:	ARCO Products Company #2035/#0805-123.002	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	11/14/95

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		CAS Acceptance	Relative Percent
Analyte	LCS	DLCS	LCS	DLCS	LCS	DLCS	Limits	**Difference**
TRPH	2.05	2.05	2.10	2.03	102	99	75-125	3

* 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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Products Company #2035/#0805-123.002
Sample Matrix: Water

Service Request: S951413
Date Collected: 11/9/95
Date Received: 11/9/95
Date Extracted: NA
Date Analyzed: 11/13/95

Surrogate Recovery Summary
Volatile Organic Compounds
EPA Method 8240

		Percent Recovery		
Sample Name	**Lab Code**	1,2-Dichloroethane-D_4	Toluene-D_8	4-Bromofluorobenzene
MW-4 (25)	S951413-002	97	103	94
Method Blank	S951115-WMB	90	96	94
CAS Acceptance Limits:		76-114	88-110	86-115

SUR3/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Products Company #2035/#0805-123.002

Service Request: S951413
Date Analyzed: 11/13/95

Initial Calibration Verification (ICV) Summary
Volatile Organic Compounds
EPA Method 624
Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Methyl-tert-butyl ether	50	50.9	102	70-130

ICV41/060194

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 17075.00

Chain of Custody

ARCO Facility no. 2035 | City (Facility) Albany | Project manager (Consultant) John Youngs | Laboratory name CAS

ARCO engineer Mike Whelan | Telephone no. (ARCO) | Telephone no. (Consultant) (408)453-7300 | Fax no. (Consultant) (408)453-0452 | Contract number

Consultant name EMCON | Address (Consultant) 1921 Ringwood Ave. San Jose, CA 95131

	Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240 MTBE Only	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
1	MW-3	(33)	4		X		X	HCL	11-9-95	1150		X			X								
2	MW-4	(25)	4		X		X	HCL	↓	1230		X					X						
3	MW-1	(29)	2		X		X	HCL	↓	1310		X											
4	RW-1	(25)	2		X		X	HCL	↓	1045		X											

Method of shipment: Sampler will deliver

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: 2-40ml HCL VOAs
MW-3 add 2-HCL Lite
MW-4 add 2-40ml HCL VOA
Analyze MW-4 for MTBE only by EPA 8240; do not report any other compounds for EPA 8240.
#0805-123.002

Lab number: CAS/L9504006 S950/4/2

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: Cool

Relinquished by	Date	Time	Received by	Date	Time
Relinquished by sampler: [signature]	11-9-95	1510	Received by: Joanne Brown CAS-SJ		
Relinquished by:			Received by:		
Relinquished by: Joanne Brown	11-9-95	1800	Received by laboratory: [signature]	11-10-95	0900

Distribution: White copy — Laboratory; Canary copy — ARCO Environmental Engineering; Pink copy — Consultant   CAS-L: 418.1   CAS-S: GBTEX, 8240   11-27
APC-3292 (2-91)

APPENDIX C
SVE SYSTEM MONITORING DATA LOG SHEETS

ARCO 2035
SVE SYSTEM
MONITORING DATA

Reporting Period:
02/06/95 12:00
03/01/95 00:00

Hours in Period: 540.00
Days in Period: 22.50

Operation + Down Hours: 540.00
Operation + Down Days: 22.50

Reading Date & Time	Field Monitoring Data: Flow Rates: Well Field Flow Rate	Field Monitoring Data: Flow Rates: System Influent Flow Rate	Field Monitoring Data: FID or PID Results: Well Field	Field Monitoring Data: FID or PID Results: System Influent	Field Monitoring Data: FID or PID Results: System Effluent	Field Monitoring Data: Destruction Efficiency	Laboratory Sample Time	Laboratory Monitoring Data: Well Field Influent: Gasoline		Well Field Influent: Benzene		System Influent: Gasoline		System Influent: Benzene		System Effluent: Gasoline		System Effluent: 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						
02/06/95 12:00	0.0	0.0																						3895.45				
02/08/95 07:50	0.0	0.0																					43.83	3901.24	5.79	0.24	38.04	1.59
02/08/95 10:58	0.0	58.0																					3.13	3904.37	3.13	0.13	0.00	0.00
02/08/95 17:59	1.8	33.7	1970	395	0	100.0	17:12	3000	11000	30	110	240	880	6	21	<15	<60	<0.1	<0.5	93.2	0.18	0.00	7.02	3911.38	7.01	0.29	0.01	0.00
02/14/95 15:51	1.4	33.7	101	13.6		NR																	141.87	4053.26	141.88	5.91	-0.01	0.00
02/15/95 13:15	4.7	33.7	30.4	13.4		NR																	21.40	4074.66	21.40	0.89	0.00	0.00
02/21/95 13:33	5.9	41.3	156	33.4	8.9	73.4	14:12	600	2300	4	13	<15	<60	<0.1	<0.5	<15	<60	<0.1	<0.5	NR	0.22	0.00	144.30	4218.97	144.31	6.01	-0.01	0.00
02/28/95 13:12	7.0	33.7																					167.65	4386.60	167.63	6.98	0.02	0.00
03/01/95 00:00	4.5	33.7																					10.80	4397.40	10.80	0.45	0.00	0.00
Period Totals:																							540.00		501.95	20.91	38.05	1.59
Period Averages:	4.7	35.6	564	113.9	4.5			1800	6650	17	62	240	880	6.0	21	<15	<60	<0.1	<0.5	93.2	0.19	0.00						

ARCO 2035
SVE SYSTEM
MONITORING DATA

Reporting Period:
03/01/95 00:00
04/01/95 00:00

Hours in Period: 744.00
Days in Period: 31.00

Operation + Down Hours: 744.00
Operation + Down Days: 31.00

	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						
03/01/95 00:00																								4397.40				
03/03/95 10:08	4.5	33.7																					58.13	4416.91	19.51	0.81	38.62	1.61
03/08/95 13:19	4.5	33.7	2.5	1.7	1.8	-5.9																	123.18	4540.10	123.19	5.13	-0.01	0.00
03/08/95 15:31	1.2	25.3	1552	17.1	2	88.3	15:30	2500	8900	31	99	<15	<60	<0.1	<0.5	<15	<60	<0.1	<0.5	NR	0.14	0.00	2.20	4542.29	2.19	0.09	0.01	0.00
04/01/95 00:00	1.2	25.3																					560.48	4560.23	17.94	0.75	542.54	22.61
Period Totals:																							744.00		162.83	6.78	581.17	24.22
Period Averages:	4.1	32.7	777	9	1.9			2500	8900	31	99	<15	<60	<0.1	<0.5	<15	<60	<0.1	<0.5	NR	0.18	0.00						

ARCO 2035
SVE SYSTEM
MONITORING DATA

Reporting Period:
04/01/95 00:00
06/01/95 00:00

Hours In Period: 1464.0
Days In Period: 61.00

Operation + Down Hours: 1464.0
Operation + Down Days: 61.00

	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						
04/01/95 00:00																		4560.23					
04/19/95 10:19	1.2	25.3															442.32	4560.23	0.00	0.00	442.32	18.43
06/01/95 00:00	1.2	25.3															1021.7	4563.25	3.02	0.13	1018.7	42.44
Period Totals:																	1464.0		3.02	0.13	1461.0	60.87
Period Averages:	1.2	25.3																				

ARCO 2035
SVE SYSTEM
MONITORING DATA

Reporting Period:
06/01/95 00:00
07/01/95 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						
06/01/95 00:00																								4563.25				
06/20/95 11:58	1.2	25.3																					467.97	4563.25	0.00	0.00	467.97	19.50
06/20/95 13:57	13.9	37.1	>1000			NR	15:31	3300	12000	50	170	600	2200	10	34	<15	<60	0.5	1.5	97.3	0.20	0.00	1.98	4565.12	1.87	0.08	0.11	0.00
06/20/95 16:14	13.9	37.1																					2.28	4567.40	2.28	0.09	0.00	0.00
06/26/95 11:54	0.0	0.0																					139.67	4567.40	0.00	0.00	139.67	5.82
06/26/95 12:33	13.7	21.1																					0.65	4568.02	0.62	0.03	0.03	0.00
06/30/95 11:59	20.7	33.7																					95.43	4663.56	95.54	3.98	-0.11	0.00
07/01/95 00:00	25.3	33.7																					12.02	4675.58	12.02	0.50	0.00	0.00
Period Totals:																							720.00		112.33	4.68	607.67	25.32
Period Averages:	20.9	33.8	>1000					3300	12000	50	170	600	2200	10	34	<15	<60	0.5	1.5	97.3	0.18	0.00						

ARCO 2035
SVE SYSTEM
MONITORING DATA

Reporting Period:
07/01/95 00:00
08/01/95 00:00

Hours in Period: 744.00
Days in Period: 31.00

Operation + Down Hours: 744.00
Operation + Down Days: 31.00

	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						
07/01/95 00:00																								4675.58				
07/10/95 17:44	25.3	33.7					17:55	130	480	4	14	130	480	4	14	<15	<60	<0.1	<0.5	87.5	0.18	0.00	233.73	4909.27	233.69	9.74	0.04	0.00
07/26/95 13:32	25.3	33.7																					379.80	5288.82	379.55	15.81	0.25	0.01
08/01/95 00:00	0.0	0.0																					130.47	5289.96	1.14	0.05	129.33	5.39
Period Totals:																							744.00		614.38	25.60	129.62	5.40
Period Averages:	25.2	33.6						130	480	4.0	14	130	480	4.0	14	<15	<60	<0.1	<0.5	87.5	0.18	0.00						

ARCO 2035
SVE SYSTEM
MONITORING DATA

Reporting Period:
08/01/95 00:00
09/01/95 00:00

Hours in Period: 744.00
Days in Period: 31.00

Operation + Down Hours: 744.00
Operation + Down Days: 31.00

	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						
08/01/95 00:00	0.0	0.0																						5289.96				
08/08/95 14:51	65.5	75.9					15:40	1300	4600	17	55	1500	5600	22	69	47	170	1	3.2	97.0	1.16	0.02	182.85	5291.23	1.27	0.05	181.58	7.57
08/17/95 12:15	65.5	75.9																					213.40	5504.63	213.40	8.89	0.00	0.00
08/31/95 11:36	65.5	75.9																					335.35	5840.16	335.53	13.98	-0.18	-0.01
08/31/95 12:56	76.3	85.3					13:06	2400	11000	18	57	2400	11000	18	57	61	140	<0.1	<0.5	98.7	1.07	0.00	1.33	5841.50	1.34	0.06	-0.01	0.00
09/01/95 00:00	130.4	106.4																					11.07	5852.57	11.07	0.46	0.00	0.00
Period Totals:																							744.00		562.61	23.44	181.39	7.56
Period Averages:	66.8	76.5						1850	7800	17.5	56	1950	8300	20	63	54	155	1.0	3.2	98.1	1.07	0.02						

ARCO 2035
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																								5852.57				
09/12/95 09:02	130.4	106.4	499			NR	17:03	280	1000	2.5	8	360	1300	3.1	9.9	<15	<60	<0.1	<0.5	95.4	0.57	0.00	273.03	6125.60	273.03	11.38	0.00	0.00
09/19/95 14:43	156.7	124.2																					173.68	6298.58	172.96	7.21	0.72	0.03
09/28/95 17:35	156.0	126.8																					218.87	6515.57	217.01	9.04	1.86	0.08
09/29/95 12:54	67.0	82.6					13:15	990	3600	9	28	600	2200	6	20	<15	<60	0.2	0.7	97.3	0.45	0.01	19.32	6534.89	19.32	0.81	0.00	0.00
10/01/95 00:00	67.9	75.9					15:38	580	2100	6.3	20	410	1500	4.7	15	<15	<60	0.2	0.5	96.0	0.41	0.00	35.10	6569.99	35.10	1.46	0.00	0.00
Period Totals:																							720.00		717.42	29.89	2.58	0.11
Period Averages:	139.7	114.7	499					617	2233	5.9	19	457	1667	4.6	15	<15	<60	0.2	0.6	96.4	0.62	0.01						

ARCO 2035
SVE SYSTEM
MONITORING DATA

Reporting Period:
10/01/95 00:00
11/01/95 00:00

Hours in Period: 744.00
Days in Period: 31.00

Operation + Down Hours: 744.00
Operation + Down Days: 31.00

	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																								6569.99				
10/11/95 15:31	67.9	75.9					15:38	580	2100	6.3	20	410	1500	4.7	15	<15	<60	0.2	0.5	96.0	0.41	0.00	255.52	6825.51	255.52	10.65	0.00	0.00
10/20/95 14:40	67.9	75.9																					215.15	6892.05	66.54	2.77	148.61	6.19
10/20/95 14:51	54.8	97.1																					0.18	6892.23	0.18	0.01	0.00	0.00
10/26/95 12:04	153.4	121.7					12:25	270	970	3	9	230	830	3	8	<15	<60	<0.1	<0.5	92.8	0.66	0.01	141.22	7062.53	170.30	7.10	-29.08	-1.21
11/01/95 00:00	67.7	75.9																					131.93	7194.46	131.93	5.50	0.00	0.00
Period Totals:																							744.00		624.47	26.02	119.53	4.98
Period Averages:	91.2	88.4						425	1535	4.7	15	320	1165	3.9	12	<15	<60	0.2	0.5	94.8	0.48	0.00						

ARCO 2035
SVE SYSTEM
MONITORING DATA

Reporting Period:
11/01/95 00:00
12/01/95 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						
11/01/95 00:00																								7194.46				
11/08/95 12:16	67.7	75.9					12:46	880	3200	11	36	550	2000	7	23	<15	<60	0.4	1.2	97.0	0.41	0.01	180.27	7375.79	181.33	7.56	-1.06	-0.04
11/21/95 15:00	67.7	75.9					15:05	820	3000	<0.5	<2.5	590	2200	<0.5	<2.5	<15	<60	<0.1	<0.5	97.3	0.41	0.00	314.73	7690.52	314.73	13.11	0.00	0.00
11/30/95 11:06	68.7	67.5																					212.10	7889.65	199.13	8.30	12.97	0.54
12/01/95 00:00	68.7	67.5																					12.90	7902.55	12.90	0.54	0.00	0.00
Period Totals:																							720.00		708.09	29.50	11.91	0.50
Period Averages:	68.0	73.4						850	3100	11	36	570	2100	7.0	23	<15	<60	0.4	1.2	97.1	0.40	0.01						

ARCO 2035
SVE SYSTEM
MONITORING DATA

Reporting Period:
12/01/95 00:00
01/01/96 00:00

Hours in Period: 744.00
Days in Period: 31.00

Operation + Down Hours: 744.00
Operation + Down Days: 31.00

	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						
12/01/95 00:00																								7902.55				
12/05/95 12:50	68.7	67.5																					108.83	8011.24	108.69	4.53	0.14	0.01
12/05/95 13:15	0.0	0.0																					0.42	8011.24	0.00	0.00	0.42	0.02
12/05/95 13:55	39.1	58.1					14:45	1700	6100	13	40	310	1300	4.1	13	17	63	0.3	0.9	95.2	0.33	0.00	0.67	8011.91	0.67	0.03	0.00	0.00
12/22/95 11:00	39.1	58.1																					405.08	8167.09	155.18	6.47	249.90	10.41
12/22/95 11:35	21.3	42.1					11:30	180	670	1.8	5.7					<15	<60	<0.1	<0.5	NR	0.23	0.00	0.58	8167.67	0.58	0.02	0.00	0.00
01/01/96 00:00	26.1	53.1																					228.42	8396.09	228.42	9.52	0.00	0.00
Period Totals:																							744.00		493.54	20.56	250.46	10.44
Period Averages:	39.5	57.8						940	3385	7.4	23	310	1300	4.1	13	17	63	0.3	0.9	95.2	0.33	0.00						

APPENDIX D
FIELD DATA SHEETS, SVE SYSTEM OPERATION AND MAINTENANCE VISITS, FOURTH QUARTER 1995

ARCO 2035 . 1001 San Pablo Ave.,Albany,Ca. Soil Vapor Extraction System . EMCON Project # 0805-123.02

Remarks: System on upon arrival : Tp. Closed VW-6 & opened . Took readings Then resampled E-1 WF-1 I-1 (I-1 deflated lab notified Manufacturer & found they'd been having similar problems)

Unscheduled site visit [ ] Scheduled site visit [ ]

SYSTEM PARAMETERS (Therm Tech Model VAC-10 thermal/catalytic oxidizer)

Arrival Time (24:00 hour)	1246	**Effluent (E-1) (12"x12")**	
System Status (on or off)	ON	Stack Temperature (°F)	734
Shutdown Time (24:00 hour)	—	**SYSTEM**	
Restart Time (24:00 hour)	—	Total Flow (3") (cfm) (before blower-same as Para-Fax)	98-100
Reading Time (24:00 hour)	12:54	Fire Box Temperature (°F)	627
Well Field WF-1 (3")		Set Point (°F)	625
Vacuum (in. of H2O)	44	TOTAL HOURS	6534.89
Velocity (ft/min)	1500	Electric Meter (kwh)	15372
Temperature (°F)		Natural Gas (cf)	2811
Aeration Tank AT-1 (2")			
Vacuum (in. of H2O)	18		
Velocity (ft/min)	1450		
Flow (scfm)	28.5		
After Blower I-2 (4") (AFTER DILUTION)	Dilution Closed		
Total Pressure (in. of H2O)	.5		
Total Flow (in. of H2O)	.055		
Influent I-1 (3") (BEFORE DILUTION)			
Vacuum (in. of H2O)	44		
Velocity (ft/min)	1900-1950		

AIR MONITORING

FID (ppm)	Amb	WF-1	AT-1	I-1	I-2	E-1
Date:						

PID (ppm)	CAL GAS:					
Date:						
Date:						

Lab samples taken for analysis at: I-1 E-1 WF-1

PARA-FAX on/off ON

Cleaned K.O. pump pre-filter ? yes/no NO

WELL FIELD

SVE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (In. of H2O)	FID (ppm)	PID (ppm)	Bubbler (on/off)	Remarks
VW-1	4"	5'-17'			Full ON				NA	
VW-2	4"	5'-17'			↓				NA	
VW-3	4"	4.5'-9.5'			Closed				NA	
VW-4	4"	5'-17'			Full ON				NA	
VW-5	4"	4.5'-14.5'			↓				NA	
VW-6	4"	5'-12.5'			Closed				NA	
VW-7	4"	5'-15'			Full ON				NA	
VW-8	4"	5'-15'							NA	
VW-9	4"	5'-15'							NA	
RW-1	6"	11'-26'								
AS-1 (vent)	2"	5'-15'								
AS-2 (vent)	2"	5'-15'			↓					

SPARGE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Pressure (psi)	Air Flow (scfm)	DO (ppm)	REMARKS
AS-1	2"	28.3'-30.3'							
AS-2	2"	28.8'-30.8'							

Total Sparge Data

Total Air Sparge Pressure(psi)=	Total Air Sparge Flow Rate(scfm)=	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# 0805-123.02

ARCO 2035 Soil Vapor Extraction System

ARCO 2035 . 1001 San Pablo Ave.,Albany,Ca. Soil Vapor Extraction System . EMCON Project # 20805-123.002

Remarks: System on upon arrival . Took readings . Sampled I-1 E-1 WF-1

No changes made to well field

Unscheduled site visit ☐ Scheduled site visit ☒

SYSTEM PARAMETERS (Therm Tech Model VAC-10 thermal/catalytic oxidizer)

Arrival Time (24:00 hour)	14:45	**Effluent (E-1) (12"x12")**	
System Status (on or off)	ON	Stack Temperature (°F)	719
Shutdown Time (24:00 hour)	—	**SYSTEM**	
Restart Time (24:00 hour)	—	Total Flow (3") (cfm) (before blower-same as Para-Fax)	98-100
Reading Time (24:00 hour)	15:31	Fire Box Temperature (°F)	630
Well Field WF-1 (3")		Set Point (°F)	630
Vacuum (in. of H2O)	38.5-39.1	TOTAL HOURS	6825.51
Velocity (ft/min)	1500	Electric Meter (kwh)	16685
Temperature (°F)	70	Natural Gas (cf)	2946000
Aeration Tank AT-1 (2")			
Vacuum (in. of H2O)	19.5		
Velocity (ft/min)	1300		
Flow (scfm)	26		
After Blower I-2 (4") (AFTER DILUTION)	Dilution Closed		
Total Pressure (in. of H2O)	.5		
Total Flow (in. of H2O)	.05		
Influent I-1 (3") (BEFORE DILUTION)			
Vacuum (in. of H2O)	39.8-40.2		
Velocity (ft/min)	2400-2500		

AIR MONITORING

FID (ppm)	Amb	WF-1	AT-1	I-1	I-2	E-1
Date:						

PID (ppm)	CAL GAS:					
Date:						
Date:						

Lab samples taken for analysis at: I-1 E-1 WF-1

PARA-FAX on/off ON

Cleaned K.O. pump pre-filter ? yes/no NO

WELL FIELD

SVE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (in. of H2O)	Velocity (fpm)	Product Recovered (ml)	PID (ppm)	Bubbler (on/off)
VW-1	4"	5'-17'								NA
VW-2	4"	5'-17'								NA
VW-3	4"	4.5'-9.5'								NA
VW-4	4"	5'-17'								NA
VW-5	4"	4.5'-14.5'								NA
VW-6	4"	5'-12.5'								NA
VW-7	4"	5'-15'								NA
VW-8	4"	5'-15'								NA
VW-9	4"	5'-15'								NA
RW-1	6"	11'-26'								NA
AS-1 (vent)	2"	5'-15'								
AS-2 (vent)	2"	5'-15'								

SPARGE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Pressure (psi)	Air Flow (scfm)	DO (ppm)	REMARKS
AS-1	2"	28.3'-30.3'							
AS-2	2"	28.8'-30.8'							

Total Sparge Data

Total Air Sparge Pressure(psi)=	Total Air Sparge Flow Rate(scfm)=	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/m^3. Report O_2 and CO_2 in % by volume.

Operator: MAller **Date:** 10/11/95

Project# 20805-123.002

ARCO 2035 Soil Vapor Extraction System

ARCO 2035 . 1001 San Pablo Ave.,Albany,Ca. Soil Vapor Extraction System . EMCON Project # 20805-123.002

Remarks: Cleaned Airation Tank and replaced old regulator with new. Water Totalizer at 15:10 hrs = 0006786 Gls. Note: Therm-Tec "Control Failure" light Blinking (should'nt do that) System went down - restarted - ~~OK~~ Scheduled site visit [x] Scheduled site visit []

SYSTEM PARAMETERS (Therm Tech Model VAC-10 thermal/catalytic oxidizer)

Arrival Time (24:00 hour)	1030	**Effluent (E-1) (12"x12")**	
System Status (on or off)	OFF	Stack Temperature (°F)	687
Shutdown Time (24:00 hour)	—	**SYSTEM**	
Restart Time (24:00 hour)	1440	Total Flow (3") (cfm) (before blower-same as Para-Fax)	
Reading Time (24:00 hour)	1451	Fire Box Temperature (°F)	621
Well Field WF-1 (3")		Set Point (°F)	610
Vacuum (in. of H2O)	20	TOTAL HOURS	6992.23
Velocity (ft/min)	1150	Electric Meter (kwh)	
Temperature (°F)	75	Natural Gas (cf)	
Aeration Tank AT-1 (2")		**AIR MONITORING**	
Vacuum (in. of H2O)	20		
Velocity (ft/min)	45		
Flow (scfm)	15		
After Blower I-2 (4") (AFTER DILUTION)		**PID (ppm)** CAL GAS:	
Total Pressure (in. of H2O)	1		
Total Flow (in. of H2O)	1150		
Influent I-1 (3") (BEFORE DILUTION)		**Lab samples taken for analysis at:**	
Vacuum (in. of H2O)	20	**PARA-FAX on/off**	
Velocity (ft/min)		**Cleaned K.O. pump pre-filter ? yes/no**	

FID (ppm)	Amb	WF-1	AT-1	I-1	I-2	E-1
Date:						
				-		

PID (ppm)						
Date:						
Date:						

WELL FIELD

SVE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (in. of H2O)	Velocity (fpm)	Product Recovered (ml)	PID (ppm)	Bubbler (on/off)
VW-1	4"	5'-17'								NA
VW-2	4"	5'-17'								NA
VW-3	4"	4.5'-9.5'								NA
VW-4	4"	5'-17'								NA
VW-5	4"	4.5'-14.5'								NA
VW-6	4"	5'-12.5'								NA
VW-7	4"	5'-15'								NA
VW-8	4"	5'-15'								NA
VW-9	4"	5'-15'								NA
RW-1	6"	11'-26'								NA
AS-1 (vent)	2"	5'-15'								
AS-2 (vent)	2"	5'-15'								

SPARGE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Pressure (psi)	Air Flow (scfm)	DO (ppm)	REMARKS
AS-1	2"	28.3'-30.3'							
AS-2	2"	28.8'-30.8'							

Total Sparge Data

Total Air Sparge Pressure(psi)=	Total Air Sparge Flow Rate(scfm)=	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/m^3. Report O_2 and CO_2 in % by volume.

Operator: J. Whitten / L. Roth **Date:** 10-20-95

Project# 20805-123.002

ARCO 2035 Soil Vapor Extraction System

ARCO 2035 . 1001 San Pablo Ave.,Albany,Ca. Soil Vapor Extraction System . EMCON Project # 20805-123.002

Remarks: System on upon arrival. Temp variations noted on chart but Catalyst stayed well above 600°F, WL raised setpoint from 625°F to 675°F to ensure this. Cap on top of RW-1 found leaking air by - retightened OK. Took readings & sampled I-1 E-1 WF-1 o Ba. Heat Product. Check VAC Unscheduled site visit [] influence Scheduled site visit [] on MW wells.

SYSTEM PARAMETERS (Therm Tech Model VAC-10 thermal/catalytic oxidizer)

Arrival Time (24:00 hour)	11:15	**Effluent (E-1) (12"x12")**	
System Status (on or off)	ON	Stack Temperature (°F)	727
Shutdown Time (24:00 hour)	—	**SYSTEM**	
Restart Time (24:00 hour)	—	Total Flow (3") (cfm) (before blower-same as Para-Fax)	>100
Reading Time (24:00 hour)	12:04	Fire Box Temperature (°F)	683
Well Field WF-1 (3")		Set Point (°F)	675
Vacuum (in. of H2O)	29.2	TOTAL HOURS	7062.53
Velocity (ft/min)	3300	Electric Meter (kwh)	17615
Temperature (°F)	63	Natural Gas (cf)	306/000
Aeration Tank AT-1 (2")			
Vacuum (in. of H2O)	16.9		
Velocity (ft/min)	1000		
Flow (scfm)	22		
After Blower I-2 (4") (AFTER DILUTION)			
Total Pressure (in. of H2O)	1.5		
Total Flow (in. of H2O)	.13		
Influent I-1 (3") (BEFORE DILUTION)			
Vacuum (in. of H2O)	34.2-34.8		
Velocity (ft/min)	3600		

AIR MONITORING

FID (ppm)	Amb	WF-1	AT-1	I-1	I-2	E-1
Date:						

PID (ppm)	CAL GAS:					
Date:						
Date:						

Lab samples taken for analysis at: E-1 I-1 WF-1

PARA-FAX on/off ON

Cleaned K.O. pump pre-filter ? yes/no NO

WELL FIELD

SVE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (in. of H2O)	Velocity (fpm)	Product Recovered (ml)	PID (ppm)	Bubbler (on/off)
VW-1	4"	5'-17'	11.00	11.01	Full on	25.5		20		NA
VW-2	4"	5'-17'	13.21	13.31	Full on	25.5		25		NA
VW-3	4"	4.5'-9.5'	ND	DRY	Closed	0.03	TD = 7.05'	0		NA
VW-4	4"	5'-17'	ND	9.74	Full on	25.3		0		NA
VW-5	4"	4.5'-14.5'	ND	10.18	"	25.3		0		NA
VW-6	4"	5'-12.5'	ND	6.88	Closed	28.6	may not be	working		NA
VW-7	4"	5'-15'	10.91	11.02	Full on	19.0		270		NA
VW-8	4"	5'-15'	ND	10.55		21.9		0		NA
VW-9	4"	5'-15'	ND	10.50		22.4		0		NA
RW-1	6"	11'-26'	ND	19.80		23.9		0		
AS-1 (vent)	2"	5'-15'	10.75	10.76		>25.7		6		
AS-2 (vent)	2"	5'-15'	ND	8.38				0		

SPARGE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Pressure (psi)	Air Flow (scfm)	DO (ppm)	REMARKS
AS-1	2"	28.3'-30.3'	ND	13.35	Closed	0	0		
AS-2	2"	28.8'-30.8'	ND	13.37	Closed	0	0		

Total Sparge Data

Total Air Sparge Pressure(psi)=	Total Air Sparge Flow Rate(scfm)=	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: V.Nh. Hem/M. Adler Date: 10/26/95

Project# 20805-123.002

ARCO 2035 Soil Vapor Extraction System

Remarks:

Performed Biweekly OEM, TOOK Vapor Samples E-1, E-1e, WF-1

Unscheduled site visit ☐ Scheduled site visit ☑

SYSTEM PARAMETERS (Therm Tech Model VAC-10 thermal/catalytic oxidizer)

Arrival Time (24:00 hour)	1040	**Effluent (E-1) (12"x12")**	—
System Status (on or off)	ON	Stack Temperature (°F)	777
Shutdown Time (24:00 hour)	—	**SYSTEM**	—
Restart Time (24:00 hour)	—	Total Flow (3") (cfm) (before blower-same as Para-Fax)	—
Reading Time (24:00 hour)	1216	Fire Box Temperature (°F)	677
Well Field WF-1 (3")	—	Set Point (°F)	675
Vacuum (in. of H2O) 1500	40	TOTAL HOURS	7375.79
Velocity (ft/min) Assume ~~3350~~		Electric Meter (kwh)	18985
Temperature (°F)	64	Natural Gas (cf)	3,201,00
Aeration Tank AT-1 (2")	—		
Vacuum (in. of H2O)	20		
Velocity (ft/min)	~~2~~		
Flow (scfm)	23		
After Blower I-2 (4") (AFTER DILUTION)	0.5 —		
Total Pressure (in. of H2O) Assumed	~~40~~		
Total Flow (in. of H2O)	.045(900		
Influent I-1 (3") (BEFORE DILUTION)			
Vacuum (in. of H2O)	/		
Velocity (ft/min)			

AIR MONITORING

FID (ppm)	Amb	WF-1	AT-1	I-1	I-2	E-1
Date:						

PID (ppm)	CAL GAS:					
Date:						
Date:						

Lab samples taken for analysis at:

PARA-FAX on/off

Cleaned K.O. pump pre-filter ? yes/no

WELL FIELD

SVE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (in. of H2O)	Velocity (fpm)	Product Recovered (ml)	PID (ppm)	Bubbler (on/off)
VW-1	4"	5'-17'								NA
VW-2	4"	5'-17'								NA
VW-3	4"	4.5'-9.5'								NA
VW-4	4"	5'-17'								NA
VW-5	4"	4.5'-14.5'								NA
VW-6	4"	5'-12.5'								NA
VW-7	4"	5'-15'								NA
VW-8	4"	5'-15'								NA
VW-9	4"	5'-15'								NA
RW-1	6"	11'-26'								
AS-1 (vent)	2"	5'-15'								
AS-2 (vent)	2"	5'-15'								

SPARGE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Pressure (psi)	Air Flow (scfm)	DO (ppm)	REMARKS
AS-1	2"	28.3'-30.3'							
AS-2	2"	28.8'-30.8'							

Total Sparge Data

Total Air Sparge Pressure(psi)= C	Total Air Sparge Flow Rate(scfm)= C	Total Air Sparge Temp(F)= C

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: J. Whitten **Date:** 11-8-95

Project# 20805-123.002

ARCO 2035 Soil Vapor Extraction System

Remarks: Onginal fieldsheet was lost
System parameters were assumed from previous fieldsheet 11/8/95
Data entered on 3/5/96

Unscheduled site visit [] Scheduled site visit []

SYSTEM PARAMETERS (Therm Tech Model VAC-10 thermal/catalytic oxidizer)

Arrival Time (24:00 hour)		**Effluent (E-1) (12"x12")**	
System Status (on or off)		Stack Temperature (°F)	
Shutdown Time (24:00 hour)		**SYSTEM**	
Restart Time (24:00 hour)		Total Flow (3") (cfm) (before blower-same as Para-Fax)	
Reading Time (24:00 hour)	15:00	Fire Box Temperature (°F)	
Well Field WF-1 (3")		Set Point (°F)	
Vacuum (in. of H2O)	40	TOTAL HOURS	7690.52
Velocity (ft/min)	1500	Electric Meter (kwh)	
Temperature (°F)		Natural Gas (cf)	
Aeration Tank AT-1 (2")		**AIR MONITORING**	
Vacuum (in. of H2O)	~~0.5~~	FID (ppm) / Amb / WF-1 / AT-1 / I-1 / I-2 / E-1	
Velocity (ft/min)	~~900~~	Date:	
Flow (scfm)			
After Blower I-2 (4") (AFTER DILUTION)		**PID (ppm)** CAL GAS:	
Total Pressure (in. of H2O)	0.5	Date:	
Total Flow (in. of H2O)	900 fpm	Date:	
Influent I-1 (3") (BEFORE DILUTION)		**Lab samples taken for analysis at:** WF-1, I-1, E-1	
Vacuum (in. of H2O)		**PARA-FAX on/off**	
Velocity (ft/min)		**Cleaned K.O. pump pre-filter ? yes/no**	

WELL FIELD

SVE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (in. of H2O)	Velocity (fpm)	Product Recovered (ml)	PID (ppm)	Bubbler (on/off)
VW-1	4"	5'-17'								NA
VW-2	4"	5'-17'								NA
VW-3	4"	4.5'-9.5'								NA
VW-4	4"	5'-17'								NA
VW-5	4"	4.5'-14.5'								NA
VW-6	4"	5'-12.5'								NA
VW-7	4"	5'-15'								NA
VW-8	4"	5'-15'								NA
VW-9	4"	5'-15'								NA
RW-1	6"	11'-26'								
AS-1 (vent)	2"	5'-15'								
AS-2 (vent)	2"	5'-15'								

SPARGE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Pressure (psi)	Air Flow (scfm)	DO (ppm)	REMARKS
AS-1	2"	28.3'-30.3'							
AS-2	2"	28.8'-30.8'							

Total Sparge Data

Total Air Sparge Pressure(psi)=	Total Air Sparge Flow Rate(scfm)=	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/m^3. Report O_2 and CO_2 in % by volume.

Project# 20805-123.002

Operator:_____ **Date:** 11/21/95 **ARCO 2035 Soil Vapor Extraction System**

ARCO 2035 . 1001 San Pablo Ave.,Albany,Ca. Soil Vapor Extraction System . EMCON Project # 20805-123.002

Remarks: On site - system running - Met Tim Quann w/EBMUD for sample of Effluent water - Took EPA 624
Adjusted system per S. Yalamanchili request.

Unscheduled site visit ☒ Scheduled site visit ☐

SYSTEM PARAMETERS (Therm Tech Model VAC-10 thermal/catalytic oxidizer)

Arrival Time (24:00 hour)	1003	**Effluent (E-1) (12"x12")**	—
System Status (on or off)	ON	Stack Temperature (°F)	763
Shutdown Time (24:00 hour)	—	**SYSTEM**	—
Restart Time (24:00 hour)	—	Total Flow (3") (cfm) (before blower-same as Para-Fax)	80
Reading Time (24:00 hour)	1106	Fire Box Temperature (°F)	704
Well Field WF-1 (3")	—	Set Point (°F)	700
Vacuum (in. of H2O)	35	TOTAL HOURS	7809.65
Velocity (ft/min) Assume 1500		Electric Meter (kwh)	21189
Temperature (°F)	62	Natural Gas (cf)	3479000
Aeration Tank AT-1 (2")		**AIR MONITORING**	
Vacuum (in. of H2O)	20		
Velocity (ft/min)	—		
Flow (scfm)	30-32		
After Blower I-2 (4") (AFTER DILUTION)	No Dilution		
Total Pressure (in. of H2O) Assumed 0.5	3.5		
Total Flow (in. of H2O)	.074		
Influent I-1 (3") (BEFORE DILUTION)			
Vacuum (in. of H2O)	32		
Velocity (ft/min)	.04		

FID (ppm)	Amb	WF-1	AT-1	I-1	I-2	E-1
Date:						

PID (ppm)	CAL GAS:					
Date:						
Date:						

Lab samples taken for analysis at:

PARA-FAX on/off ON

Cleaned K.O. pump pre-filter ? yes/no NO

WELL FIELD

SVE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (in. of H2O)	Velocity (fpm)	Product Recovered (ml)	PID (ppm)	Bubbler (on/off)
VW-1	4"	5'-17'								NA
VW-2	4"	5'-17'								NA
VW-3	4"	4.5'-9.5'								NA
VW-4	4"	5'-17'								NA
VW-5	4"	4.5'-14.5'								NA
VW-6	4"	5'-12.5'								NA
VW-7	4"	5'-15'		NA						NA
VW-8	4"	5'-15'								NA
VW-9	4"	5'-15'								NA
RW-1	6"	11'-26'								
AS-1 (vent)	2"	5'-15'								
AS-2 (vent)	2"	5'-15'								

SPARGE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Pressure (psi)	Air Flow (scfm)	DO (ppm)	REMARKS
AS-1	2"	28.3'-30.3'							
AS-2	2"	28.8'-30.8'							

Total Sparge Data

Total Air Sparge Pressure(psi)=	Total Air Sparge Flow Rate(scfm)=	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: D. Whitten Date: 11-30-95

Project# 20805-123.002
ARCO 2035 Soil Vapor Extraction System

ARCO 2035 . 1001 San Pablo Ave.,Albany,Ca. Soil Vapor Extraction System . EMCON Project # 20805-123.002

Remarks: System on upon arrival - performed adjustments per B. Macedu's memo dated 12/5/95.
Took Vapor Samples: WF-1, ~~[illegible]~~ & ~~[illegible]~~ (~~[illegible]~~) I-1 & EFF

Unscheduled site visit ☐ Scheduled site visit ☑

SYSTEM PARAMETERS (Therm Tech Model VAC-10 thermal/catalytic oxidizer)

Arrival Time (24:00 hour)	1100	**Effluent (E-1) (12"x12")**	—
System Status (on or off)	ON	Stack Temperature (°F)	830
Shutdown Time (24:00 hour)	1250	**SYSTEM**	—
Restart Time (24:00 hour)	1315	Total Flow (3") (cfm) (before blower-same as Para-Fax)	60
Reading Time (24:00 hour)	1355	Fire Box Temperature (°F)	700
Well Field WF-1 (3")	—	Set Point (°F)	700
Vacuum (in. of H2O)	54	TOTAL HOURS	8011.91
Velocity (ft/min)	900	Electric Meter (kwh)	21705
Temperature (°F)	65	Natural Gas (cf)	~~[illegible]~~ 3530000
Aeration Tank AT-1 (2")	—	**AIR MONITORING**	
Vacuum (in. of H2O)	20		
Velocity (ft/min)	—		
Flow (scfm)	31		
After Blower I-2 (4") (AFTER DILUTION)	No Dilution		
Total Pressure (in. of H2O)	.05		
Total Flow (in. of H2O)	.03		
Influent I-1 (3") (BEFORE DILUTION)	No Dilution		
Vacuum (in. of H2O)	50		
Velocity (ft/min)	700		

FID (ppm)	Amb	WF-1	AT-1	I-1	I-2	E-1
Date:						

PID (ppm)	CAL GAS:					
Date:						
Date:						

Lab samples taken for analysis at: CAS

PARA-FAX on/off ON

Cleaned K.O. pump pre-filter ? yes/no no

WELL FIELD

SVE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (in. of H2O)	Velocity (fpm)	Product Recovered (ml)	PID (ppm)	Bubbler (on/off)
VW-1	4"	5'-17'			100	54				NA
VW-2	4"	5'-17'			100	54				NA
VW-3	4"	4.5'-9.5'			—	off				NA
VW-4	4"	5'-17'			—	off				NA
VW-5	4"	4.5'-14.5'			—	off				NA
VW-6	4"	5'-12.5'			—	off				NA
VW-7	4"	5'-15'			100	54				NA
VW-8	4"	5'-15'			—	off				NA
VW-9	4"	5'-15'			—	off				NA
RW-1	6"	11'-26'			—	off				NA
AS-1 (vent)	2"	5'-15'			100	54				
AS-2 (vent)	2"	5'-15'			—	off				

SPARGE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Pressure (psi)	Air Flow (scfm)	DO (ppm)	REMARKS
AS-1	2"	28.3'-30.3'							
AS-2	2"	28.8'-30.8'							

Total Sparge Data

Total Air Sparge Pressure(psi)= N/A | Total Air Sparge Flow Rate(scfm)= N/A | Total Air Sparge Temp(F)= N/A

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: V. Whitten Date: 12-5-95

Project# 20805-123.002
ARCO 2035 Soil Vapor Extraction System

ARCO 2035 . 1001 San Pablo Ave.,Albany,Ca. Soil Vapor Extraction System . EMCON Project # 20805-123.002

Remarks: System down on control fault - High containment level - drained rain water from containment. started system Assume restart hrs 8167.09

Unscheduled site visit [] Scheduled site visit [✓]

SYSTEM PARAMETERS (Therm Tech Model VAC-10 thermal/catalytic oxidizer)

Arrival Time (24:00 hour)	1025	Effluent (E-1) (12"x12")	—
System Status (on or off)	off	Stack Temperature (°F)	711
Shutdown Time (24:00 hour)	—	SYSTEM	—
Restart Time (24:00 hour)	1100	Total Flow (3") (cfm) (before blower-same as Para-Fax)	60-60
Reading Time (24:00 hour)	1135	Fire Box Temperature (°F)	722
Well Field WF-1 (3")	—	Set Point (°F)	720
Vacuum (in. of H2O)	60	TOTAL HOURS	8167.07
Velocity (~~ft/min~~) CFM	40-60	Electric Meter (kwh)	—
Temperature (°F)	52	Natural Gas (cf)	—
Aeration Tank AT-1 (2")	—		
Vacuum (in. of H2O)	32-36		
Velocity (ft/min)	—		
Flow (scfm)	31-32		
After Blower I-2 (4") (AFTER DILUTION)	—		
Total Pressure (in. of H2O) assumed	0.3-60.		
Total Flow (in. ~~of~~ H2O) FPM	500		
Influent I-1 (3") (BEFORE DILUTION)	—		
Vacuum (in. of H2O)	55		
Velocity (~~ft/min~~) FPM	500		

AIR MONITORING

FID (ppm)	Amb	WF-1	AT-1	I-1	I-2	E-1
Date:						

PID (ppm)	CAL GAS:					
Date:						
Date:						

Lab samples taken for analysis at: CAS

PARA-FAX on/off: ON

Cleaned K.O. pump pre-filter ? yes/no: No

WELL FIELD

SVE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (in. of H2O)	Velocity (fpm)	Product Recovered (ml)	PID (ppm)	Bubbler (on/off)
VW-1	4"	5'-17'								NA
VW-2	4"	5'-17'								NA
VW-3	4"	4.5'-9.5'								NA
VW-4	4"	5'-17'								NA
VW-5	4"	4.5'-14.5'								NA
VW-6	4"	5'-12.5'								NA
VW-7	4"	5'-15'								NA
VW-8	4"	5'-15'								NA
VW-9	4"	5'-15'								NA
RW-1	6"	11'-26'								
AS-1 (vent)	2"	5'-15'								
AS-2 (vent)	2"	5'-15'								

SPARGE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Pressure (psi)	Air Flow (scfm)	DO (ppm)	REMARKS
AS-1	2"	28.3'-30.3'							OAA
AS-2	2"	28.8'-30.8'							OAA

Total Sparge Data

Total Air Sparge Pressure(psi)=	Total Air Sparge Flow Rate(scfm)=	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: V. Whitten Date: 12/22/95

Project# 20805-123.002

ARCO 2035 Soil Vapor Extraction System

APPENDIX E

ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY DOCUMENTATION, SVE SYSTEM AIR SAMPLES, FOURTH QUARTER 1995

Columbia Analytical Services inc.

October 12, 1995

Service Request No: S951225

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

Re: **0805-123.02 / TO# 8121.00 /2035 Albany**

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

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: 0805-123.02 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S951225
Date Collected: 9/29/95
Date Received: 9/29/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name:	**E-1**	**I-1**	**WF-1**
Lab Code:	S951225-001	S951225-002	S951225-003
Date Analyzed:	9/30/95	9/30/95	9/30/95

Analyte	**MRL**			
Benzene	0.5	0.7	20	28
Toluene	0.5	1.7	50	81
Ethylbenzene	0.5	ND	23	36
Total Xylenes	1	6.3	180	330
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20	ND	<100 *	<100 *
C_5 - C_8 Hydrocarbons	20	27	1,400	2,100
C_9 - C_{12} Hydrocarbons	20	ND	780	1,500
Gasoline Fraction (C_5-C_{12})	60	ND	2,200	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: 0805-123.02 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S951225
Date Collected: 9/29/95
Date Received: 9/29/95
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
Project: 0805-123.02 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S951225
Date Collected: 9/29/95
Date Received: 9/29/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name:	**E-1**	**I-1**	**WF-1**
Lab Code:	S951225-001	S951225-002	S951225-003
Date Analyzed:	9/30/95	9/30/95	9/30/95

Analyte	**MRL**			
Benzene	0.1	0.2	6	9
Toluene	0.1	0.5	13	21
Ethylbenzene	0.1	0.1	5	8
Total Xylenes	0.2	1.4	41	76
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	5	ND	<30 *	<30 *
C_5 - C_8 Hydrocarbons	5	8	380	580
C_9 - C_{12} Hydrocarbons	5	5	210	410
Gasoline Fraction (C_5-C_{12})	15	ND	600	990

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

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S951225
Project:	0805-123.02 / TO# 8121.00 / 2035 Albany	**Date Collected:**	9/29/95
Sample Matrix:	Vapor	**Date Received:**	9/29/95
		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

APPENDIX A

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 0805-123.02 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S951225
Date Collected: 9/29/95
Date Received: 9/29/95
Date Extracted: NA
Date Analyzed: 9/29,30/95

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	8.3	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.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 0805-123.02 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S951225
Date Collected: 9/29/95
Date Received: 9/29/95
Date Extracted: NA
Date Analyzed: 9/29,30/95

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

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 8121.00

Chain of Custody

ARCO Facility no. 2035	City (Facility) Albany	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 07077

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
E-1		2			X (Vapor)			9/29/95	13:15		X											
I-1		2			X			"	13:21		X											
WF-1		2			X			"	13:28		X											

Method of shipment: Tech

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

Special QA/QC

Remarks: 20805-123.002

Lab number: 595-01225

Turnaround time

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

Condition of sample:		Temperature received:	
Relinquished by sampler	Date 9/29/95 Time 16:05	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
APC-3292 (2-91)

Columbia Analytical Services inc.

October 25, 1995 Service Request No: S951276

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

Re: **0805-123.02 / TO# 8121.00 / 2035 Albany**

Dear Ms. Yelamanchili:

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	**Service Request:**	S951276
Project:	0805-123.02 / TO# 8121.00 / 2035 Albany	**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:	**E-1**	**WF-1**	**I-1**
		Lab Code:	S951276-001	S951276-002	S951276-003
		Date Analyzed:	10/12/95	10/12/95	10/12/95
Analyte	**MRL**				
Benzene	0.5		0.5	20	15
Toluene	0.5		1.3	48	33
Ethylbenzene	0.5		ND	19	14
Total Xylenes	1		3.8	140	97
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	20		ND	<100 *	<100 *
C_5 - C_8 Hydrocarbons	20		ND	1,500	1,100
C_9 - C_{12} Hydrocarbons	20		ND	650	420
Gasoline Fraction (C_5-C_{12})	60		ND	2,100	1,500

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

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S951276
Project:	0805-123.02 / TO# 8121.00 / 2035 Albany	**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	**Service Request:**	S951276
Project:	0805-123.02 / TO# 8121.00 / 2035 Albany	**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:	**E-1**	**WF-1**	**I-1**
		Lab Code:	S951276-001	S951276-002	S951276-003
		Date Analyzed:	10/12/95	10/12/95	10/12/95
Analyte	**MRL**				
Benzene	0.1		0.2	6.3	4.7
Toluene	0.1		0.3	13	8.7
Ethylbenzene	0.1		ND	4.4	3.2
Total Xylenes	0.2		0.9	32	22
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	5		ND	<30 *	<30 *
C_5 - C_8 Hydrocarbons	5		5	410	300
C_9 - C_{12} Hydrocarbons	5		ND	180	120
Gasoline Fraction (C_5-C_{12})	15		ND	580	410

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

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S951276
Project:	0805-123.02 / TO# 8121.00 / 2035 Albany	**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

3S22/060194

APPENDIX A

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 0805-123.02 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S951276
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: mg/m^3

Sample Name: WF-1
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_5-C_{12})	60	2,100	2,300	2,200	9

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 0805-123.02 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S951276
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: WF-1
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. 8121.00

Chain of Custody

ARCO Facility no. 2035	City (Facility) Albany	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 Semi Metals ☐ VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐
E-1		1			X			10/11/95	15:38		X									
WF-1		1			X				15:47		X									
T-1		1			X				15:43		X									

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

Special QA/QC

Remarks: 0805-123.02

Lab number: S9501276

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

Columbia Analytical Services inc.

November 2, 1995

Service Request No: S951335

Bruce Maeda
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

Re: **20805-123-002 / TO# 8121.00 / 2035 Albany**

Dear Mr. Maeda:

The following pages contain analytical results for sample(s) received by the laboratory on October 26, 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	**Service Request:**	S951335
Project:	20805-123.002 / TO# 8121.00 / 2035 Albany	**Date Collected:**	10/26/95
Sample Matrix:	Vapor	**Date Received:**	10/26/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name:	**E-1**	**I-1**	**WF-1**
Lab Code:	S951335-001	S951335-002	S951335-003
Date Analyzed:	10/26/95	10/26/95	10/26/95

Analyte	**MRL**			
Benzene	0.5	ND	8	9
Toluene	0.5	0.5	14	16
Ethylbenzene	0.5	ND	4	5
Total Xylenes	1	1.2	37	49
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20	ND	<100 *	<100 *
C_5 - C_8 Hydrocarbons	20	23	680	750
C_9 - C_{12} Hydrocarbons	20	ND	150	220
Gasoline Fraction (C_5-C_{12})	60	ND	830	970

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

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 20805-123.002 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S951335
Date Collected: 10/26/95
Date Received: 10/26/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name:	**Method Blank**
Lab Code:	S951335-001
Date Analyzed:	10/26/95

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: 20805-123.002 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S951335
Date Collected: 10/26/95
Date Received: 10/26/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name:	**E-1**	**I-1**	**WF-1**
Lab Code:	S951335-001	S951335-002	S951335-003
Date Analyzed:	10/26/95	10/26/95	10/26/95

Analyte	**MRL**			
Benzene	0.1	ND	3	3
Toluene	0.1	0.1	4	4
Ethylbenzene	0.1	ND	0.9	1
Total Xylenes	0.2	0.3	9	11
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	5	ND	<30 *	<30 *
C_5 - C_8 Hydrocarbons	5	6	190	210
C_9 - C_{12} Hydrocarbons	5	ND	41	60
Gasoline Fraction (C_5-C_{12})	15	ND	230	270

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

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S951335
Project:	20805-123.002 / TO# 8121.00 / 2035 Albany	**Date Collected:**	10/26/95
Sample Matrix:	Vapor	**Date Received:**	10/26/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name:	**Method Blank**
Lab Code:	S951335-001
Date Analyzed:	10/26/95

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

3S22/060194

APPENDIX A

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-123.002 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S951335
Date Collected: 10/26/95
Date Received: 10/26/95
Date Extracted: NA
Date Analyzed: 10/26/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name: Batch QC
Lab Code: S951325-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.5	4	4	4	<1
Toluene	0.5	27	27	27	<1
Ethylbenzene	0.5	60	60	60	<1
Xylenes, Total	1	480	480	480	<1
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	20	<100 *	<100 *	<100 *	<1
C_5 - C_8 Hydrocarbons	20	360	370	365	3
C_9 - C_{12} Hydrocarbons	20	970	990	980	2
Gasoline Fraction (C_5-C_{12})	60	1,330	1,400	1,365	5

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

DUP1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-123.002 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S951335
Date Collected: 10/26/95
Date Received: 10/26/95
Date Extracted: NA
Date Analyzed: 10/26/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name: Batch QC
Lab Code: S951325-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.1	1.3	1.3	1.3	<1
Toluene	0.1	7.2	7.2	7.2	<1
Ethylbenzene	0.1	14	14	14	<1
Xylenes, Total	0.2	110	110	110	<1
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	5	<30 *	<30 *	<30 *	<1
C_5 - C_8 Hydrocarbons	5	99	100	99.5	1
C_9 - C_{12} Hydrocarbons	5	270	270	270	<1
Gasoline Fraction (C_5-C_{12})	15	360	380	370	5

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

DUP1S/060194

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 8121.00

Chain of Custody

ARCO Facility no. 2035	City (Facility) Albany	Project manager (Consultant) B. Maeda	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) 408-377-8697	Telephone no. (Consultant) 408-453-7300	Fax no. (Consultant) 408-453	Contract number 07077
Consultant name EMCON	Address (Consultant) 1921 Ringwood		Method of shipment Tech

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX EPA 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	1			X (Vapor)			10/26/95	12:25		X									
I-1	2	1			X			"	12:30		X									
WF-1	3	1			X			"	12:35		X									

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

Special QA/QC

Remarks: 20805-123,002

Lab number: 5950335

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 10/26/95	Time 1725	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory Joanne Brown — Date 10/26/95 — Time 1725

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

Columbia Analytical Services INC.

November 22, 1995

Service Request No: S951404

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

Re: **20805-123.002 / TO #8121.00 / 2035 Albany**

Dear Ms. Yelamanchili:

The following pages contain analytical results for samples received by the laboratory on November 8, 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 8, 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: 2035 Albany / TO# 8121.00 / 20805-123.002
Sample Matrix: Vapor

Service Request: S951404
Date Collected: 11/8/95
Date Received: 11/8/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

	Sample Name:	E-1	WF-1	I-1
	Lab Code:	S951404-001	S951404-002	S951404-003
	Date Analyzed:	11/9/95	11/9/95	11/9/95
Analyte	**MRL**			
Benzene	0.5	1.2	36	23
Toluene	0.5	1.4	52	32
Ethylbenzene	0.5	ND	12	6
Total Xylenes	1	2	88	52
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20	ND	<100*	<100*
C_5 - C_8 Hydrocarbons	20	42	2700	1700
C_9 - C_{12} Hydrocarbons	20	ND	500	290
Gasoline Fraction (C_5-C_{12})	60	ND	3200	2000

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

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 2035 Albany / TO# 8121.00 / 20805-123.002
Sample Matrix: Vapor

Service Request: S951404
Date Collected: 11/8/95
Date Received: 11/8/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name:	**Method Blank**
Lab Code:	S951109VB
Date Analyzed:	11/9/95

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: 2035 Albany / TO# 8121.00 / 20805-123.002
Sample Matrix: Vapor

Service Request: S951404
Date Collected: 11/8/95
Date Received: 11/8/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name:	**E-1**	**WF-1**	**I-1**
Lab Code:	S951404-001	S951404-002	S951404-003
Date Analyzed:	11/9/95	11/9/95	11/9/95

Analyte	**MRL**			
Benzene	0.1	0.4	11	7
Toluene	0.1	0.4	14	8
Ethylbenzene	0.1	ND	3	1
Total Xylenes	0.2	0.5	20	12
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	5	ND	<30*	<30*
C_5 - C_8 Hydrocarbons	5	12	740	470
C_9 - C_{12} Hydrocarbons	5	ND	140	80
Gasoline Fraction (C_5-C_{12})	15	ND	880	550

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

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S951404
Project:	2035 Albany / TO# 8121.00 / 20805-123.002	**Date Collected:**	11/8/95
Sample Matrix:	Vapor	**Date Received:**	11/8/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name:	**Method Blank**
Lab Code:	S951109VB
Date Analyzed:	11/9/95

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

3S22/060194

APPENDIX A

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 2035 Albany / TO# 8121.00 / 20805-123.002
Sample Matrix: Vapor

Service Request: S951404
Date Collected: 11/8/95
Date Received: 11/8/95
Date Extracted: NA
Date Analyzed: 11/9/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name: Batch QC
Lab Code: S951395-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.5	18.3	18.7	19	2
Toluene	0.5	74.6	74.3	74	<1
Ethylbenzene	0.5	41.9	41.5	42	<1
Xylenes, Total	1	194	193	194	<1
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	20	<200*	<200*	--	<1
C_5 - C_8 Hydrocarbons	20	1,190	1,190	1,190	<1
C_9 - C_{12} Hydrocarbons	20	956	912	934	5
Gasoline Fraction (C_5-C_{12})	60	2,150	2,100	2,125	2

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

DUP1S/060194

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 8121.00

Chain of Custody

ARCO Facility no. 2035	City (Facility) Albany	Project manager (Consultant) S. Velamanchili	Laboratory name
ARCO engineer Mike Whelan	Telephone no. (ARCO) 408 377 8697	Telephone no. (Consultant) 408 453 7300	Fax no. (Consultant) 408-453-0452	Contract number
Consultant name EMCON	Address (Consultant) 1921 Ringwood Ave, San Jose, CA		Method of shipment

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐
E-1		1			Y (Vapor)			11-8-95	1246		X									
WF-1		1			X			11-8-95	1256		X									
I-1		1			Y			11-8-95	1307		Y				(Water in Tedlar)					

Special detection Limit/reporting: Please report in ml/m³ and PPMv

Special QA/QC

Remarks: 20805-123.002

Lab number: 9950404

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: Dan Matthews	Date: 11-8-95 Time: 1414	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory: Joanne Brooks	Date: 11-8-95 Time: 1414

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

11-22

Columbia Analytical Services inc.

December 19, 1995

Service Request No: S9501476

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

Re: **20805-123.001 / TO# 8121.00 / 2035 Albany**

Dear Ms. Yelamanchili:

The following pages contain analytical results for sample(s) received by the laboratory on November 21, 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 8, 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: EMCON
Project: ARCO Products Company #2035/#20805-123.002
Sample Matrix: Air

Service Request: L9504120
Date Collected: 11/21/95
Date Received: 11/21/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons*
Units: uL/L (ppmV)

Sample Name:	**I-1**	**E-1**	**WF-1**
Lab Code:	L9504120-001†	L9504120-002	L9504120-003†
Date Analyzed:	11/22/95	11/22/95	11/22/95

Analyte	**MRL**			
Benzene[1]	0.1	<0.5	ND	<0.5
Toluene[1]	0.1	3.9	ND	5.4
Ethylbenzene[2]	0.1	1.6	ND	2.2
Total Xylenes[2]	0.2	14	0.2	21
Total Volatile Hydrocarbons**	15	620	ND	860
C1-C4 Hydrocarbons*	5	29	ND	37
C5-C8 Hydrocarbons*	5	490	ND	660
C9-C12 Hydrocarbons*	5	100	ND	160
Total Volatile Hydrocarbons**[a]	15	590	ND	820

1 Benzene and Toluene are included in the C_5-C_8 hydrocarbon fraction.

2 Ethylbenzene and Total Xylenes are included in the C_9-C_{12} hydrocarbon fraction due to the use of C_1-C_8 n-paraffins as the standard for Total Volatile Hydrocarbons.

* Total Volatile Hydrocarbons quantified using n-paraffins with a range of C_1-C_8.

** Result is rounded to two significant figures.

a Gasoline Fraction (C_5-C_{12})

† The MRL is elevated because of matrix interferences.

3SOTW/120594

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Products Company #2035/#20805-123.002
Sample Matrix: Air

Service Request: L9504120
Date Collected: NA
Date Received: NA
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons*
Units: uL/L (ppmV)

Sample Name:	**Method Blank**
Lab Code:	L9504120-MB
Date Analyzed:	11/22/95

Analyte	**MRL**	
Benzene[1]	0.1	ND
Toluene[1]	0.1	ND
Ethylbenzene[2]	0.1	ND
Total Xylenes[2]	0.2	ND
Total Volatile Hydrocarbons**	15	ND
C1-C4 Hydrocarbons*	5	ND
C5-C8 Hydrocarbons*	5	ND
C9-C12 Hydrocarbons*	5	ND
Total Volatile Hydrocarbons**[a]	15	ND

1 Benzene and Toluene are included in the C_5-C_8 hydrocarbon fraction.

2 Ethylbenzene and Total Xylenes are included in the C_9-C_{12} hydrocarbon fraction due to the use of C_1-C_8 n-paraffins as the standard for Total Volatile Hydrocarbons.

* Total Volatile Hydrocarbons quantified using n-paraffins with a range of C_1-C_8.

** Result is rounded to two significant figures.

a Gasoline Fraction (C_5-C_{12})

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	L9504120
Project:	ARCO Products Company #2035/#20805-123.002	**Date Collected:**	11/21/95
Sample Matrix:	Air	**Date Received:**	11/21/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons*
Units: mg/m^3

	Sample Name:	I-1	E-1	WF-1
	Lab Code:	L9504120-001†	L9504120-002	L9504120-003†
	Date Analyzed:	11/22/95	11/22/95	11/22/95
Analyte	**MRL**			
Benzene[1]	0.5	<2.5	ND	<2.5
Toluene[1]	0.5	15	ND	21
Ethylbenzene[2]	0.5	7.1	ND	9.7
Total Xylenes[2]	1.0	62	ND	93
Total Volatile Hydrocarbons**	60	2300	ND	3100
C1-C4 Hydrocarbons*	20	110	ND	140
C5-C8 Hydrocarbons*	20	1800	ND	2400
C9-C12 Hydrocarbons*	20	370	ND	590
Total Volatile Hydrocarbons**[a]	60	2200	ND	3000

1 Benzene and Toluene are included in the C_5-C_8 hydrocarbon fraction.

2 Ethylbenzene and Total Xylenes are included in the C_9-C_{12} hydrocarbon fraction due to the use of C_1-C_8 n-paraffins as the standard for Total Volatile Hydrocarbons.

* Total Volatile Hydrocarbons quantified using n-paraffins with a range of C_1-C_8.

** Result is rounded to two significant figures.

a Gasoline Fraction (C_5-C_{12})

† The MRL is elevated because of matrix interferences.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	L9504120
Project:	ARCO Products Company #2035/#20805-123.002	**Date Collected:**	NA
Sample Matrix:	Air	**Date Received:**	NA
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons*
Units: mg/m^3

Sample Name:	**Method Blank**
Lab Code:	L9504120-MB
Date Analyzed:	11/22/95

Analyte	**MRL**	
Benzene[1]	0.5	ND
Toluene[1]	0.5	ND
Ethylbenzene[2]	0.5	ND
Total Xylenes[2]	1.0	ND
Total Volatile Hydrocarbons**	60	ND
C1-C4 Hydrocarbons*	20	ND
C5-C8 Hydrocarbons*	20	ND
C9-C12 Hydrocarbons*	20	ND
Total Volatile Hydrocarbons**[a]	60	ND

1 Benzene and Toluene are included in the C_5-C_8 hydrocarbon fraction.

2 Ethylbenzene and Total Xylenes are included in the C_9-C_{12} hydrocarbon fraction due to the use of C_1-C_8 n-paraffins as the standard for Total Volatile Hydrocarbons.

* Total Volatile Hydrocarbons quantified using n-paraffins with a range of C_1-C_8.

** Result is rounded to two significant figures.

a Gasoline Fraction (C_5-C_{12})

APPENDIX A

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Products Company #2035/#20805-123.002
Sample Matrix: Air

Service Request: L9504120
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 11/22/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons*
Units: uL/L (ppmV)

Sample Name: Batch QC
Lab Code: L9504118-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.1	4.20	4.18	4.19	<1
Toluene	0.1	8.36	8.46	8.41	1
Ethylbenzene	0.1	1.23	1.27	1.25	3
Total Xylenes	0.2	10.5	10.7	10.6	2
Total Volatile Hydrocarbon**	15	300	320	310	6
C1-C4 Hydrocarbons*	5	ND	ND	ND	NA
C5-C8 Hydrocarbons*	5	254	266	260	5
C9-C12 Hydrocarbons*	5	49.2	50.6	49.9	3

* Total Volatile Hydrocarbons quantified using n-paraffins with a range of C1-C8.
** Result is rounded to two significant figures.

DUP1S/120594

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 8121

Chain of Custody

ARCO Facility no. 2035	City (Facility) Albany, CA	Project manager (Consultant) S. Melamanchili	Laboratory name
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 Ave San Jose		Contract number

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
I-1		1			X AIR			11/21/95	1515		X Gas	(Water in Bag)										
E-1		1			X			↓	1510		X											
WF-1		1			X			↓	1505		X											

Special detection Limit/reporting: Report in m/m^3 and PPMV

Special QA/QC

Remarks: 20805-123.002

Lab number: 595-1476

Turnaround time

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

Condition of sample:		Temperature received:
Relinquished by sampler	Date 11/21/95 Time 1634	Received by
Relinquished by	Date 11/21/95 Time 16:45	Received by
Relinquished by	Date Time	Received by laboratory / Date / Time

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

Columbia Analytical Services inc.

December 19, 1995

Service Request No: S9501547

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

Re: **20805-123.002 / TO# 8121.00 / 2035 Albany**

Dear Ms. Yelamanchili:

The following pages contain analytical results for sample(s) received by the laboratory on December 5, 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: 20805-123.002 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S9501547
Date Collected: 12/5/95
Date Received: 12/5/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name:	**E-1**	**WF-1**	**I-1**
Lab Code:	S950157-001	S950157-002	S950157-003
Date Analyzed:	12/6/95	12/6/95	12/6/95

Analyte	**MRL**			
Benzene	0.5	0.9	40	13
Toluene	0.5	0.9	46	15
Ethylbenzene	0.5	ND	10	3
Total Xylenes	1	2	100	49
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20	ND	<400*	<100*
C_5 - C_8 Hydrocarbons	20	51	5,300	1,100
C_9 - C_{12} Hydrocarbons	20	ND	710	270
Gasoline Fraction (C_5-C_{12})	60	63	6,100	1,300

* Raised MRL due to high analyte concentration requiring sample dilution

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9501547
Project:	20805-123.002 / TO# 8121.00 / 2035 Albany	**Date Collected:**	12/5/95
Sample Matrix:	Vapor	**Date Received:**	12/5/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name:	**Method Blank**
Lab Code:	S951206-VB
Date Analyzed:	12/6/95

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: 20805-123.002 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S9501547
Date Collected: 12/5/95
Date Received: 12/5/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name:	**E-1**	**WF-1**	**I-1**
Lab Code:	S950157-001	S950157-002	S950157-003
Date Analyzed:	12/6/95	12/6/95	12/6/95

Analyte	**MRL**			
Benzene	0.1	0.3	13	4.1
Toluene	0.1	0.2	12	4.0
Ethylbenzene	0.1	ND	2	0.7
Total Xylenes	0.2	0.5	23	11
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	5	ND	<100*	<30*
C_5 - C_8 Hydrocarbons	5	14	1,500	300
C_9 - C_{12} Hydrocarbons	5	ND	200	74
Gasoline Fraction (C_5-C_{12})	15	17	1,700	310

* Raised MRL due to high analyte concentration requiring sample dilution

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9501547
Project:	20805-123.002 / TO# 8121.00 / 2035 Albany	**Date Collected:**	12/5/95
Sample Matrix:	Vapor	**Date Received:**	12/5/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name:	**Method Blank**
Lab Code:	S951206-VB
Date Analyzed:	12/6/95

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: 20805-123.002 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S9501547
Date Collected: 12/5/95
Date Received: 12/5/95
Date Extracted: NA
Date Analyzed: 12/6/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name: WF-1
Lab Code: S9501547-002

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.5	40	41	41	2
Toluene	0.5	46	49	48	6
Ethylbenzene	0.5	10	<10*	10	NC
Xylenes, Total	1	100	110	105	10
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	20	<400*	<400*	<400*	<1
C_5 - C_8 Hydrocarbons	20	5,300	5,300	5,300	<1
C_9 - C_{12} Hydrocarbons	20	710	710	710	<1
Gasoline Fraction (C_5-C_{12})	60	6,100	6,000	6,050	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: 20805-123.002 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S9501547
Date Collected: 12/5/95
Date Received: 12/5/95
Date Extracted: NA
Date Analyzed: 12/6/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name: WF-1
Lab Code: S9501547-002

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.1	13	13	13	<1
Toluene	0.1	12	13	12.5	8
Ethylbenzene	0.1	2	2	2	<1
Xylenes, Total	0.2	23	25	24	8
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	5	<100*	<100*	<100*	<1
C_5 - C_8 Hydrocarbons	5	1,500	1,500	1500	<1
C_9 - C_{12} Hydrocarbons	5	200	200	200	<1
Gasoline Fraction (C_5-C_{12})	15	1,700	1,600	1650	6

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

DUP1S/060194

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 812.00

Chain of Custody

ARCO Facility no. 2035	City (Facility) Albany	Project manager (Consultant) S. Kelamanchili	Laboratory name
ARCO engineer Mike Whelan	Telephone no. (ARCO) 408 377-8647	Telephone no. (Consultant) 408 453-7300	Fax no. (Consultant) 408 453-0452
Consultant name EMCON	Address (Consultant) 1921 Ringwood Ave. San Jose, CA		Contract number

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
E-1	1	1			X			12-5-95	1445		X											
WF-1	2	1			X			12-5-95	1450		X	← Water in Sealed										
I-1	3	1			X			12-5-95	1455		X	←										

Special detection Limit/reporting: Report in M/M³ & PPMV

Special QA/QC

Remarks: 20805-123.002

Lab number: 9505547

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: Dan Whitt	Date 12-5-95 Time 1600	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory: Joanne Brown	Date 12-5-95 Time 1600

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

Due 12/19

Columbia
Analytical
Services inc.

January 2, 1996

Service Request No: S9501674

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

Re: **20805-123.002 / TO# 8121.00 / 2035 Albany**

Dear Ms. Yelamanchili:

The following pages contain analytical results for sample(s) received by the laboratory on December 22, 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 7, 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: 20805-123.002 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S9501674
Date Collected: 12/22/95
Date Received: 12/22/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

	Sample Name:	INF	EFF	Method Blank
	Lab Code:	S9501674-001	S9501674-002	S951222-VB
	Date Analyzed:	12/22/95	12/22/95	12/22/95
Analyte	**MRL**			
Benzene	0.5	5.7	ND	ND
Toluene	0.5	11	ND	ND
Ethylbenzene	0.5	5.3	ND	ND
Total Xylenes	1	35	ND	ND
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20	ND	ND	ND
C_5 - C_8 Hydrocarbons	20	400	ND	ND
C_9 - C_{12} Hydrocarbons	20	270	ND	ND
Gasoline Fraction (C_5-C_{12})	60	670	ND	ND

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 20805-123.002 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S9501674
Date Collected: 12/22/95
Date Received: 12/22/95
Date Extracted: NA

BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name:	INF	EFF	Method Blank
Lab Code:	S9501674-001	S9501674-002	S951222-VB
Date Analyzed:	12/22/95	12/22/95	12/22/95

Analyte	MRL			
Benzene	0.1	1.8	ND	ND
Toluene	0.1	2.9	ND	ND
Ethylbenzene	0.1	1.2	ND	ND
Total Xylenes	0.2	8.0	ND	ND
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	5	ND	ND	ND
C_5 - C_8 Hydrocarbons	5	110	ND	ND
C_9 - C_{12} Hydrocarbons	5	74	ND	ND
Gasoline Fraction (C_5-C_{12})	15	180	ND	ND

3822/060194

APPENDIX A

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-123.002 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S9501674
Date Collected: 12/22/95
Date Received: 12/22/95
Date Extracted: NA
Date Analyzed: 12/22/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: mg/m^3

Sample Name: Batch QC
Lab Code: S9501673-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.5	<1 *	<1 *	<1	NA
Toluene	0.5	7	8	8	13
Ethylbenzene	0.5	2	2	2	<1
Xylenes, Total	1	23	24	24	4
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	20	<40 *	<40 *	<40	NA
C_5 - C_8 Hydrocarbons	20	1,300	1,300	1,300	<1
C_9 - C_{12} Hydrocarbons	20	100	100	100	<1
Gasoline Fraction (C_5-C_{12})	60	1,400	1,400	1,400	<1

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

DUP1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-123.002 / TO# 8121.00 / 2035 Albany
Sample Matrix: Vapor

Service Request: S9501674
Date Collected: 12/22/95
Date Received: 12/22/95
Date Extracted: NA
Date Analyzed: 12/22/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: ppmV

Sample Name: Batch QC
Lab Code: S9501673-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.1	<0.2 *	<0.2 *	<0.2	NA
Toluene	0.1	1.9	2.1	2	10
Ethylbenzene	0.1	0.5	0.5	0.5	<1
Xylenes, Total	0.2	5.3	5.5	5.4	4
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	5	<10 *	<10 *	<10	NA
C_5 - C_8 Hydrocarbons	5	360	360	360	<1
C_9 - C_{12} Hydrocarbons	5	28	28	28	<1
Gasoline Fraction (C_5-C_{12})	15	380	380	380	<1

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

DUP1S/060194

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 812.00

Chain of Custody

ARCO Facility no. 2035	City (Facility) Albany	Project manager (Consultant) S. Yelamanchili	Laboratory name
ARCO engineer Mike Whelan	Telephone no. (ARCO) 408 377-8697	Telephone no. (Consultant) 408 453-7300	Fax no. (Consultant) 408 453-0452	Contract number
Consultant name EMCON	Address (Consultant) 1921 Ringwood Ave. San Jose, CA		Method of shipment

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
INF		1			X (vapor)			12/22/95	1145		X											
EFF		1			X			12/22/95	1130		X											

Special detection Limit/reporting: ug/m² & ppmv

Special QA/QC

Remarks: 20805-123.002

Lab number: 595-1674

Condition of sample: Inflated

Temperature received:

Relinquished by sampler: Dan Schultz	Date 12/22/95	Time 12:55
Relinquished by	Date	Time
Relinquished by	Date	Time

Received by		
Received by		
Received by laboratory	Date 12/22/95	Time 12:55

Turnaround time

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

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

APC-3292 (2-91)

APPENDIX F

FIELD DATA SHEETS, GROUNDWATER TREATMENT SYSTEM, OPERATION AND MAINTENANCE VISITS, FOURTH QUARTER 1995

ARCO 2035 . 1001 San Pablo Ave.,Albany,Ca. Groundwater Extraction System . EMCON Project # 0805-123.02

Remarks: System OFF upon arrival. * System shows no alarms but is off. The timer is out for 11 sec's & the aeration tank low vacuum light is flashing on for an instant every 11 sec. I left the low pressure override switch on but system still shut down. I removed Greg's vacuum chart recorder & brought chart back it showed no loss of vacuums.

Restarted system at 13:35

Unscheduled site visit [X] Scheduled site visit []

SYSTEM PARAMETERS	
Arrival Time (24:00 hour)	12:46
System Status (on or off)	OFF
Shutdown Time (24:00 hour)	—
Restart Time (24:00 hour)	13:34
Reading Time (24:00 hour)	13:35
RW-1 Ejection Pressure (psi)	
RW-1 Stroke volume (ml)	
RW-1 Strokes per minute	
RW-1 Stroke counter	
RW-1 DTFP (ft)	
RW-1 DTW (ft)	
Transfer pump flow rate (gpm)	8.0
GAC-1 Pressure (psi)	6.0
GAC-2 Pressure (psi)	4.0
#1 Filter IN (psi)	5.0
#1 Filter OUT (psi)	1.5
#2 Filter IN (psi)	13.0
#2 Filter OUT (psi)	9.5
Air compressor run time (hrs)	100.2
Air compressor discharge (psi)	110
Regulated discharge (psi)	70
RW-1 RUN TIME (hrs)	205.6
TOTALIZER (gal)	61536

SYSTEM CHECKLIST	Yes	No	Other
Alarm Trip? * See note	X		
Change Bag Filters ?			
Check Scale Control Unit ?			
Check Aeration Tank Baffles ?			
Clean Pad ?			
Backwash Carbon Drums ?			

Notes:

SAMPLE PARAMETERS			
SAMPLE LOCATION	TEMP (F)	EC	pH (units)
E-1 (E) effluent			
I-3 (D) between carbon drums			
I-2 after aeration tank			
I-1 (A) influent			

Special Instructions:

Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form.

Operator: MAdler Date: 9/29/95

Project # 0805-123.02
ARCO 2035 Groundwater Extraction System

ARCO 2035 . 1001 San Pablo Ave.,Albany,Ca. Groundwater Extraction System . EMCON Project # 20805-123.002

Remarks: System on upon arrival . Greg changed relays – looks good and is running good.

Regulator after Comp is fluctuating between 40-80 psi. –

Speedaire 4Z546

Took readings & Took samples

Biogrowth (Green) found in bag after Aeration Tank

Unscheduled site visit ☐ Scheduled site visit ☒

SYSTEM PARAMETERS	
Arrival Time (24:00 hour)	14:45
System Status (on or off)	ON
Shutdown Time (24:00 hour)	—
Restart Time (24:00 hour)	—
Reading Time (24:00 hour)	14:54
RW-1 Ejection Pressure (psi)	
RW-1 Stroke volume (ml)	
RW-1 Strokes per minute	
RW-1 Stroke counter	
RW-1 DTFP (ft)	
RW-1 DTW (ft)	
Transfer pump flow rate (gpm)	8.0
GAC-1 Pressure (psi)	5.5
GAC-2 Pressure (psi)	3.0
#1 Filter IN (psi)	6.0
#1 Filter OUT (psi)	2.0
#2 Filter IN (psi)	19.0
#2 Filter OUT (psi)	7.5
Air compressor run time (hrs)	105.8
Air compressor discharge (psi)	110
Regulated discharge (psi)	50
RW-1 RUN TIME (hrs)	254.0
TOTALIZER (gal)	67161.6

SYSTEM CHECKLIST	Yes	No	Other
Alarm Trip?		X	
Change Bag Filters ?	X	Both changed	
Check Scale Control Unit ?		X	
Check Aeration Tank Baffles ?		X	
Clean Pad ?		X	
Backwash Carbon Drums ?		X	

Notes:

SAMPLE PARAMETERS

SAMPLE LOCATION	TEMP (°F)	EC (umhos/cm)	pH (units)
E-1 (E) effluent	66.7	652	7.99
I-3 (D) between carbon drums	66.8	652	7.93
I-2 after aeration tank	67.1	653	8.16
I-1 (A) influent	68.5	669	6.54

Special Instructions:

Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form.

Operator: MAdler **Date:** 10/11/95

Project #20805-123.002
ARCO 2035 Groundwater Extraction System

ARCO 2035 . 1001 San Pablo Ave.,Albany,Ca. Groundwater Extraction System . EMCON Project # 20805-123.002

Remarks: System off upon arrival . Aeration Tank High level
Found regulator to pump failed Air moving water to tank
at 30-85 psi Tried to repair Regulator but all metal
body has plastic bottom insert - plastic just snapped off
Biogrowth in Aeration Tank breaking away due to high
pressure - Tank metals steamed out & reg. needs replaced.
Solenoid = Cat # 821064 Asco

Unscheduled site visit [X] Scheduled site visit [ ]

SYSTEM PARAMETERS	
Arrival Time (24:00 hour)	11:00
System Status (on or off)	OFF
Shutdown Time (24:00 hour)	—
Restart Time (24:00 hour)	11:48
Reading Time (24:00 hour)	11:48
RW-1 Ejection Pressure (psi)	
RW-1 Stroke volume (ml)	
RW-1 Strokes per minute	
RW-1 Stroke counter	
RW-1 DTFP (ft)	
RW-1 DTW (ft)	
Transfer pump flow rate (gpm)	
GAC-1 Pressure (psi)	
GAC-2 Pressure (psi)	
#1 Filter IN (psi)	
#1 Filter OUT (psi)	
#2 Filter IN (psi)	
#2 Filter OUT (psi)	
Air compressor run time (hrs)	
Air compressor discharge (psi)	
Regulated discharge (psi)	
RW-1 RUN TIME (hrs)	258.5
TOTALIZER (gal)	67663.4

SYSTEM CHECKLIST	Yes	No	Other
Alarm Trip?	X		
Change Bag Filters ?	X		
Check Scale Control Unit ?			
Check Aeration Tank Baffles ?			
Clean Pad ?			
Backwash Carbon Drums ?			

Notes:

SAMPLE PARAMETERS

SAMPLE LOCATION	TEMP (°F)	EC (umhos/cm)	pH (units)
E-1 (E) effluent			
I-3 (D) between carbon drums			
I-2 after aeration tank			
I-1 (A) influent			

Special Instructions:

Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form.

Operator: Adler/White **Date:** 10/12/95

Project #20805-123.002
ARCO 2035 Groundwater Extraction System

ARCO 2035 . 1001 San Pablo Ave.,Albany,Ca. Groundwater Extraction System . EMCON Project # 20805-123.002

Remarks: System on upon arrival . Tank is still clean . System working good Influent water has no order of gasoline

New regulator after compressor is working properly. Pump has a very steady flow.

Pump is moving ~ 2 gpm

Unscheduled site visit [] Scheduled site visit X

SYSTEM PARAMETERS	
Arrival Time (24:00 hour)	11:15
System Status (on or off)	ON
Shutdown Time (24:00 hour)	—
Restart Time (24:00 hour)	—
Reading Time (24:00 hour)	11:57
RW-1 Ejection Pressure (psi)	
RW-1 Stroke volume (ml)	
RW-1 Strokes per minute	
RW-1 Stroke counter	
RW-1 DTFP (ft)	ND
RW-1 DTW (ft)	19.80
Transfer pump flow rate (gpm)	8.4
GAC-1 Pressure (psi)	6.5
GAC-2 Pressure (psi)	4.5
#1 Filter IN (psi)	5.0
#1 Filter OUT (psi)	1.75
#2 Filter IN (psi)	10.75
#2 Filter OUT (psi)	10.0
Air compressor run time (hrs)	114.1
Air compressor discharge (psi)	110
Regulated discharge (psi)	60
RW-1 RUN TIME (hrs)	329.4
TOTALIZER (gal)	75001.0

SYSTEM CHECKLIST	Yes	No	Other
Alarm Trip?		X	
Change Bag Filters ?		X	
Check Scale Control Unit ?		X	
Check Aeration Tank Baffles ?	X	clean	s.f. 11
Clean Pad ?	X		
Backwash Carbon Drums ?		X	

Notes:

SAMPLE PARAMETERS			
SAMPLE LOCATION	TEMP (°F)	EC (umhos/cm)	pH (units)
E-1 (E) effluent			
I-3 (D) between carbon drums			
I-2 after aeration tank			
I-1 (A) influent			

Special Instructions:

Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form.

Operator: MAdler/K. Whitten Date: 10/26/95

Project #20805-123.002
ARCO 2035 Groundwater Extraction System

ARCO 2035 . 1001 San Pablo Ave.,Albany,Ca. Groundwater Extraction System . EMCON Project # 20805-123.002

Remarks:

Performed Biweekly O&M, Took Water samples.

Unscheduled site visit ☐ Scheduled site visit ☑

SYSTEM PARAMETERS	
Arrival Time (24:00 hour)	1040
System Status (on or off)	ON
Shutdown Time (24:00 hour)	—
Restart Time (24:00 hour)	—
Reading Time (24:00 hour)	1206
RW-1 Ejection Pressure (psi)	60
RW-1 Stroke volume (ml)	—
RW-1 Strokes per minute	—
RW-1 Stroke counter	—
RW-1 DTFP (ft)	—
RW-1 DTW (ft)	—
Transfer pump flow rate (gpm)	7.2
GAC-1 Pressure (psi)	9
GAC-2 Pressure (psi)	3.5
#1 Filter IN (psi)	4
#1 Filter OUT (psi)	2
#2 Filter IN (psi)	13
#2 Filter OUT (psi)	13
Air compressor run time (hrs)	148.5
Air compressor discharge (psi)	60
Regulated discharge (psi)	60
RW-1 RUN TIME (hrs)	642.6
TOTALIZER (gal)	107282

SYSTEM CHECKLIST	Yes	No	Other
Alarm Trip?		✓	
Change Bag Filters ?	✓		
Check Scale Control Unit ?	✓		
Check Aeration Tank Baffles ?	✓		
Clean Pad ?	✓		
Backwash Carbon Drums ?		✓	

Notes: Changed Both Filters

SAMPLE PARAMETERS			
SAMPLE LOCATION	TEMP (°F)	EC (umhos/cm)	pH (units)
E-1 (E) effluent	64.3	661	7.85
I-3 (D) between carbon drums	64.2	660	7.87
I-2 after aeration tank	63.1	641	8.21
I-1 (A) influent	65.2	663	6.74

Special Instructions:

Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form.

Operator: C. Whitten Date: 11-6-95

Project #20805-123.002
ARCO 2035 Groundwater Extraction System

ARCO 2035 . 1001 San Pablo Ave.,Albany,Ca. Groundwater Extraction System . EMCON Project # 20805-123.002

Remarks: Met Tim Quane w/ EBM, TOOK EPA 624 of effluent water discharge. He stated he would like to see a "Spill Response" report on site and a log to record visits.

TOOK monthly water sample & Effluent 624

Unscheduled site visit [X] Scheduled site visit [ ]

SYSTEM PARAMETERS	
Arrival Time (24:00 hour)	1003
System Status (on or off)	OFF
Shutdown Time (24:00 hour)	unknown
Restart Time (24:00 hour)	1030
Reading Time (24:00 hour)	1117
RW-1 Ejection Pressure (psi)	60
RW-1 Stroke volume (ml)	—
RW-1 Strokes per minute	—
RW-1 Stroke counter	—
RW-1 DTFP (ft)	—
RW-1 DTW (ft)	—
Transfer pump flow rate (gpm)	7.4 est
GAC-1 Pressure (psi)	10
GAC-2 Pressure (psi)	3
#1 Filter IN (psi)	14
#1 Filter OUT (psi)	14
#2 Filter IN (psi)	7
#2 Filter OUT (psi)	3
Air compressor run time (hrs)	205.7
Air compressor discharge (psi)	90
Regulated discharge (psi)	60
RW-1 RUN TIME (hrs)	1122.7
TOTALIZER (gal)	152144

SYSTEM CHECKLIST	Yes	No	Other
Alarm Trip?		X	
Change Bag Filters ?	X		
Check Scale Control Unit ?		X	
Check Aeration Tank Baffles ?		X	
Clean Pad ?		X	
Backwash Carbon Drums ?		X	

Notes: Calibrate PH meter
7 PH = 7.02
4 PH = 3.99
1000 cond = 949

SAMPLE PARAMETERS			
SAMPLE LOCATION	TEMP (°F)	EC (umhos/cm)	pH (units)
E-1 (E) effluent	60.0	802	6.48
I-3 (D) between carbon drums	61.5	783	6.70
I-2 after aeration tank	63.1	807	7.51
I-1 (A) influent	64.5	802	6.80

Special Instructions:

Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form.

Operator: D. Whitten Date: 11-30-95

Project #20805-123.002
ARCO 2035 Groundwater Extraction System

ARCO 2035 . 1001 San Pablo Ave.,Albany,Ca. Groundwater Extraction System . EMCON Project # 20805-123.002

Remarks:

System on upon arrival - perform O&M, perform adjustments per B. Marda's memo dated 12-5-95.

Unscheduled site visit [] Scheduled site visit []

SYSTEM PARAMETERS	
Arrival Time (24:00 hour)	1100
System Status (on or off)	ON
Shutdown Time (24:00 hour)	1250
Restart Time (24:00 hour)	1315
Reading Time (24:00 hour)	1405
RW-1 Ejection Pressure (psi)	60
RW-1 Stroke volume (ml)	—
RW-1 Strokes per minute	—
RW-1 Stroke counter	—
RW-1 DTFP (ft)	~~5.36~~ Now
RW-1 DTW (ft)	15.36
Transfer pump flow rate (gpm)	7.2
GAC-1 Pressure (psi)	10
GAC-2 Pressure (psi)	3
#1 Filter IN (psi)	4-7
#1 Filter OUT (psi)	2
#2 Filter IN (psi)	14
#2 Filter OUT (psi)	14
Air compressor run time (hrs)	221.3
Air compressor discharge (psi)	100
Regulated discharge (psi)	60
RW-1 RUN TIME (hrs)	1242.6
TOTALIZER (gal)	164290

SYSTEM CHECKLIST	Yes	No	Other
Alarm Trip?		X	
Change Bag Filters ?	X		
Check Scale Control Unit ?		X	
Check Aeration Tank Baffles ?	X		
Clean Pad ?		X	
Backwash Carbon Drums ?		X	

Notes:

SAMPLE PARAMETERS			
SAMPLE LOCATION	TEMP (°F)	EC (umhos/cm)	pH (units)
E-1 (E) effluent			
I-3 (D) between carbon drums			
I-2 after aeration tank			
I-1 (A) influent			

Special Instructions:

Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form.

Operator: V. Whitten Date: 12-5-95

Project #20805-123.002
ARCO 2035 Groundwater Extraction System

ARCO 2035 . 1001 San Pablo Ave.,Albany,Ca. Groundwater Extraction System . EMCON Project # 20805-123.002

Remarks:

System down - High containment level. Restarted

Unscheduled site visit [] Scheduled site visit []

SYSTEM PARAMETERS	
Arrival Time (24:00 hour)	1025
System Status (on or off)	off
Shutdown Time (24:00 hour)	—
Restart Time (24:00 hour)	1100
Reading Time (24:00 hour)	1135
RW-1 Ejection Pressure (psi)	60
RW-1 Stroke volume (ml)	—
RW-1 Strokes per minute	—
RW-1 Stroke counter	—
RW-1 DTFP (ft)	—
RW-1 DTW (ft)	—
Transfer pump flow rate (gpm)	0
GAC-1 Pressure (psi)	6
GAC-2 Pressure (psi)	4
#1 Filter IN (psi)	12
#1 Filter OUT (psi)	12
#2 Filter IN (psi)	25
#2 Filter OUT (psi)	25
Air compressor run time (hrs)	237.8
Air compressor discharge (psi)	60
Regulated discharge (psi)	60
RW-1 RUN TIME (hrs)	—
TOTALIZER (gal)	175139

SYSTEM CHECKLIST	Yes	No	Other
Alarm Trip?	✓		
Change Bag Filters ?	✓		
Check Scale Control Unit ?	✓		
Check Aeration Tank Baffles ?	✓		
Clean Pad ?		✓	
Backwash Carbon Drums ?		✓	

Notes:

SAMPLE PARAMETERS			
SAMPLE LOCATION	TEMP (°F)	EC (umhos/cm)	pH (units)
E-1 (E) effluent			
I-3 (D) between carbon drums			
I-2 after aeration tank			
I-1 (A) influent			

Assume Hot. + at 1135
1350

Special Instructions:

Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form.

Operator: B. Whitten Date: 12/22/95

Project #20805-123.002
ARCO 2035 Groundwater Extraction System

APPENDIX G

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

Columbia
Analytical
Services inc.

November 22, 1995

Service Request No: S951405

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

Re: **20805-123.002 / TO #8121.00 / 2035 Albany**

Dear Ms. Yelamanchili:

The following pages contain analytical results for samples received by the laboratory on November 8, 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 6, 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:**	S951405
Project:	2035 Albany / TO#8121.00 / # 20805-123.002	**Date Collected:**	11/8/95
Sample Matrix:	Water	**Date Received:**	11/8/95
		Date Extracted:	NA
		Date Analyzed:	11/15-17/95

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

Analyte:	**TPH as Gasoline**	**Benzene**	**Toluene**	**Ethyl-benzene**	**Xylenes, Total**
Units:	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
Method Reporting Limit:	50	0.5	0.5	0.5	0.5
Sample Name	**Lab Code**				
E-1(E)	S951405-001	ND	ND	ND	ND	ND
I-3(D)	S951405-002	ND	ND	ND	ND	ND
I-2	S951405-003	1800	2.5	2.7	3.8	35
I-1(A)	S951405-004	2500	38	27	8	240
Method Blank	S951115-WB	ND	ND	ND	ND	ND
Method Blank	S951117-WB	ND	ND	ND	ND	ND

APPENDIX A

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 2035 Albany / TO#8121.00 / # 20805-123.002
Sample Matrix: Water

Service Request: S951405
Date Collected: 11/8/95
Date Received: 11/8/95
Date Extracted: NA
Date Analyzed: 11/15-17/95

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
E-1(E)	S951405-001	87	97
I-3(D)	S951405-002	94	98
I-2	S951405-003	84	112
I-1(A)	S951405-004	90	102
Method Blank	S951115-WB	90	104
Method Blank	S951117-WB	91	97
CAS Acceptance Limits:		69-116	69-116

SUR2/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S951405
Project:	2035 Albany / TO#8121.00 / # 20805-123.002	**Date Analyzed:**	11/8/95

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

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	24.2	97	85-115
Toluene	25	24.3	97	85-115
Ethylbenzene	25	24.2	97	85-115
Xylenes, Total	75	74.4	99	85-115
Gasoline	250	257	103	90-110

ICV25AL/060194

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 8121.00

Chain of Custody

ARCO Facility no. 2035	City (Facility) Albany	Project manager (Consultant) S. Yelamanchili	Laboratory name
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 Ave, San Jose, CA		Contract number

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015 Gas	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(E)	1	2		X		X	X	11-8-95	1230		X											
I-3(D)	2	2		X		X	X		1232		X											
I-2	3	2		X		X	X		1234		X											
I-1(A)	4	2		X		X	X	↓	1236		X											

Special detection Limit/reporting

Special QA/QC

Remarks

20805-123.002

Lab number 5950405

Turnaround time

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

Method of shipment

Condition of sample: OK

Temperature received: Cool

Relinquished by sampler: Dan White	Date 11-8-95	Time 1414
Relinquished by	Date	Time
Relinquished by	Date	Time

Received by		
Received by		
Received by laboratory: Jane Brown	Date 11-8-95	Time 1414

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

Columbia
Analytical
Services inc.

December 14, 1995

Service Request No: S9501516

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

Re: **20805-123.002 / TO# 8121.00 / 2035 Albany**

Dear Ms. Yelamanchili:

The following pages contain analytical results for sample(s) received by the laboratory on November 30, 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:**	S9501516
Project:	20805-123.002 / TO# 8121.00 /2035 Albany	**Date Collected:**	11/30/95
Sample Matrix:	Water	**Date Received:**	11/30/95
		Date Extracted:	NA
		Date Analyzed:	12/8,9/95

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

Analyte:	**TPH as Gasoline**	**Benzene**	**Toluene**	**Ethyl-benzene**	**Xylenes, Total**
Units:	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
Method Reporting Limit:	50	0.5	0.5	0.5	0.5
Sample Name	**Lab Code**				
E-1 (E)	S9501516-001	ND	ND	ND	ND	ND
I-3 (D)	S9501516-002	ND	ND	ND	ND	ND
I-2	S9501516-003	220	5.0	7.4	1.7	22
I-1 A	S9501516-004	29,000	190	530	300	3,100
Method Blank	S95208-WB	ND	ND	ND	ND	ND

5ABTXGAS/061694

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 20805-123.002 / TO# 8121.00 /2035 Albany
Sample Matrix: Water

Service Request: S9501516
Date Collected: 11/30/95
Date Received: 11/30/95
Date Extracted: NA

Volatile Organic Compounds
EPA Method 8240
Units: ug/L (ppb)

	Sample Name:	**E-1 (E)**	**Method Blank**
	Lab Code:	S9501516-001	S951208-WB
	Date Analyzed:	12/8/95	12/8/95
Analyte	**MRL**		
Chloromethane	10	ND	ND
Vinyl Chloride	10	ND	ND
Bromomethane	10	ND	ND
Chloroethane	10	ND	ND
Trichlorofluoromethane (CFC 11)	1	ND	ND
Trichlorotrifluoroethane (CFC 113)	10	ND	ND
1,1-Dichloroethene	1	ND	ND
Acetone	20	ND	ND
Carbon Disulfide	1	ND	ND
Methylene Chloride	10	ND	ND
trans-1,2-Dichloroethene	1	ND	ND
cis-1,2-Dichloroethene	1	ND	ND
2-Butanone (MEK)	10	ND	ND
1,1-Dichloroethane	1	ND	ND
Chloroform	1	ND	ND
1,1,1-Trichloroethane (TCA)	1	ND	ND
Carbon Tetrachloride	1	ND	ND
Benzene	1	ND	ND
1,2-Dichloroethane	1	ND	ND
Vinyl Acetate	10	ND	ND
Trichloroethene (TCE)	1	ND	ND
1,2-Dichloropropane	1	ND	ND
Bromodichloromethane	1	ND	ND
2-Chloroethyl Vinyl Ether	10	ND	ND
trans-1,3-Dichloropropene	1	ND	ND
4-Methyl-2-pentanone (MIBK)	10	ND	ND
2-Hexanone	10	ND	ND
Toluene	1	ND	ND
cis-1,3-Dichloropropene	1	ND	ND
1,1,2-Trichloroethane	1	ND	ND
Tetrachloroethene (PCE)	1	ND	ND
Dibromochloromethane	1	ND	ND
Chlorobenzene	1	ND	ND
Ethylbenzene	1	ND	ND
Styrene	1	ND	ND
Total Xylenes	5	ND	ND
Bromoform	1	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND
1,3-Dichlorobenzene	1	ND	ND
1,4-Dichlorobenzene	1	ND	ND
1,2-Dichlorobenzene	1	ND	ND

APPENDIX A

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9501516
Project:	20805-123.002 / TO# 8121.00 /2035 Albany	**Date Collected:**	11/30/95
Sample Matrix:	Water	**Date Received:**	11/30/95
		Date Extracted:	NA
		Date Analyzed:	12/8,9/95

Surrogate Recovery Summary
BTEX 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
E-1 (E)	S9501516-001	95	94
I-3 (D)	S9501516-002	91	94
I-2	S9501516-003	86	99
I-1 A	S9501516-004	81	100
MS	S9501524-001MS	102	111
DMS	S9501524-001DMS	98	107
Method Blank	S95208-WB	90	95
	CAS Acceptance Limits:	69-116	69-116

SUR2/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-123.002 / TO# 8121.00 /2035 Albany

Service Request: S9501516
Date Analyzed: 12/8/95

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

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	22.8	91	85-115
Toluene	25	22.9	92	85-115
Ethylbenzene	25	22.9	92	85-115
Xylenes, Total	75	69.2	92	85-115
Gasoline	250	246	98	90-110

ICV25AL/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-123.002 / TO# 8121.00 /2035 Albany
Sample Matrix: Water

Service Request: S9501516
Date Collected: 11/30/95
Date Received: 11/30/95
Date Extracted: NA
Date Analyzed: 12/8,9/95

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: S9501524-001

Analyte	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference
Gasoline	50,000	50,000	46,000	96,000	95,000	100	98	67-121	1

DMS1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-123.002 / TO# 8121.00 /2035 Albany
Sample Matrix: Water

Service Request: S9501516
Date Collected: 11/30/95
Date Received: 11/30/95
Date Extracted: NA
Date Analyzed: 12/8/95

Surrogate Recovery Summary
Volatile Organic Compounds
EPA Method 8240

		Percent Recovery		
Sample Name	**Lab Code**	1,2-Dichloroethane-D_4	Toluene-D_8	4-Bromofluorobenzene
E-1 (E)	S9501516-001	103	106	88
MS	S9501517-001MS	104	106	101
DMS	S9501517-001DMS	105	106	99
Method Blank	S951208-WB	89	99	98
CAS Acceptance Limits:		76-114	88-110	86-115

SUR3/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-123.002 / TO# 8121.00 /2035 Albany

Service Request: S9501516
Date Analyzed: 8/24/95

Initial Calibration Verification (ICV) Summary
Volatile Organic Compounds
EPA Method 624
Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Chloromethane	50	50.1	100	70-130
Vinyl Chloride	50	53.0	106	70-130
Bromomethane	50	53.2	106	70-130
Chloroethane	50	53.4	107	70-130
Acetone	50	59.7	119	70-130
1,1-Dichloroethene	50	56.5	113	70-130
Carbon Disulfide	50	52.8	106	70-130
Methylene Chloride	50	54.6	109	70-130
trans-1,2-Dichloroethene	50	56.0	112	70-130
cis-1,2-Dichloroethene	50	55.6	111	70-130
1,1-Dichloroethane	50	56.2	112	70-130
Vinyl Acetate	50	45.8	92	70-130
2-Butanone (MEK)	50	53.8	108	70-130
Chloroform	50	56.6	113	70-130
1,1,1-Trichloroethane (TCA)	50	56.8	114	70-130
Carbon Tetrachloride	50	54.3	109	70-130
Benzene	50	48.0	96	70-130
1,2-Dichloroethane	50	56.7	113	70-130
Trichloroethene (TCE)	50	47.6	95	70-130
1,2-Dichloropropane	50	47.3	95	70-130
Bromodichloromethane	50	46.8	94	70-130
2-Chloroethyl Vinyl Ether	50	62.6	125	70-130
2-Hexanone	50	60.8	122	70-130
trans-1,3-Dichloropropene	50	48.6	97	70-130
Toluene	50	47.9	96	70-130
cis-1,3-Dichloropropene	50	46.6	93	70-130
1,1,2-Trichloroethane	50	57.6	115	70-130
Tetrachloroethene (PCE)	50	53.6	107	70-130
Dibromochloromethane	50	51.5	103	70-130
Chlorobenzene	50	51.0	102	70-130
Ethylbenzene	50	48.4	97	70-130
o- Xylene	50	50.1	100	70-130
Styrene	50	48.3	97	70-130
Bromoform	50	49.1	98	70-130
1,1,2,2-Tetrachloroethane	50	49.6	99	70-130
Methyl-tert-butyl ether*	50	63.7	127	70-130

* ICV for Methyl-tert-butyl ether analyzed on 11/28/95

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 20805-123.002 / TO# 8121.00 /2035 Albany
Sample Matrix: Water

Service Request: S9501516
Date Collected: 11/30/95
Date Received: 11/30/95
Date Extracted: NA
Date Analyzed: 12/8/95

Matrix Spike/Duplicate Matrix Spike Summary
Volatile Organic Compounds
EPA Method 8240
Units: ug/L (ppb)

Sample Name: Batch QC
Lab Code: S9501517-001

Analyte	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference
1,1-Dichloroethene	250	250	ND	260	262	104	105	61-145	<1
Trichloroethene	250	250	ND	242	242	97	97	71-120	<1
Chlorobenzene	250	250	ND	243	244	97	98	75-130	<1
Toluene	250	250	ND	247	248	99	99	76-125	<1
Benzene	250	250	ND	252	251	101	100	76-127	<1

DMS1S/060194

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 8121.00

Chain of Custody

ARCO Facility no. 2035	City (Facility) Albany, CA	Project manager (Consultant) S. Yalimanchili	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) 408 377-8647	Telephone no. (Consultant) 408 453-7300	Fax no. (Consultant) 408 453-0452
Consultant name EMCON	Address (Consultant) 1921 Ringwood Ave. San Jose, CA		Contract number

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
E-1(E)		4		X			X	11/30/95	1130		X					X						
E-3(D)		2		X			X	↓	↓		X											
I-2		2		X			X				X											
I-1A		2		X			X				X											

Method of shipment

Special detection Limit/reporting

Special QA/QC

Remarks

20805-123.002

Lab number 9501516

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: Cool

	Date	Time			
Relinquished by sampler	11-30-95	1315	Received by		
Relinquished by	Date	Time	Received by		
Relinquished by	Date	Time	Received by laboratory	Date	Time
			Jesse Brown	11-30-95	1315

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