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

Date May 31, 1995
Project 0805-123.01

To:

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

3858

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We are enclosing:

Copies	Description
1	Fourth quarter 1994 groundwater monitoring report for ARCO service station 2035, Albany, California

For your:		Sent by:	
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	Review		Courier
	Information	X	Other Certified Mail

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

David Larsen
Project Coordinator

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

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

Date: May 31, 1995

Re: ARCO Station # 2035 • 1001 San Pablo Avenue • Albany, CA
Fourth Quarter 1994 Groundwater Monitoring Report

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

Submitted by:

Michael R. Whelan
Environmental Engineer

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

June 1, 1995
Project 0805-123.01

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

Re: Fourth quarter 1994 groundwater monitoring program results, ARCO service station 2035, Albany, California

Dear Mr. Whelan:

This letter presents the results of the fourth quarter 1994 groundwater monitoring program at ARCO Products Company (ARCO) service station 2035, 1001 San Pablo Avenue, Albany, California (Figure 1). The quarterly monitoring program complies with Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

BACKGROUND

In 1977, a 550-gallon waste-oil tank was removed during conversion of the site to a mini-mart. In June 1991, soil borings were drilled by RESNA Industries, Inc. (RESNA), in the area of the proposed new tank pit location. In July and August 1991, four underground storage tanks (USTs) were removed and replaced by W.F. Lewis Construction. The tank removal operation was observed by RESNA.

In 1991, RESNA conducted an initial phase of subsurface environmental investigation, which included installing three groundwater monitoring wells (MW-1, MW-2, and MW-3) and one recovery well (RW-1) in October, and conducting an aquifer pump test in November.

In August 1992, RESNA conducted a second phase of investigation which included installing six vadose wells (VW-1 through VW-6) and conducting soil-vapor extraction (SVE) pilot testing.

Between June and August 1993, RESNA conducted a third phase of investigation, which included constructing three additional vadose wells (VW-7, VW-8, and VW-9), and two

combination air-sparge/vapor extraction wells (AS-1 and AS-2), and conducting air-sparge (AS) pilot testing.

Construction of an SVE, AS, and groundwater extraction system was completed in November 1993. Initial startup of the SVE system was conducted in December 1993. The system operated until February 1994, when it was shut off because high arsenic concentrations were detected in the groundwater portion of the system. The system did not operate for the remainder of 1994; startup is planned for the second quarter of 1995.

Groundwater monitoring and sampling at the site was initiated in October 1991. There are currently 6 groundwater monitoring wells, 11 vadose wells, and two AS wells on site. For additional background information, refer to "Report of Findings, Air Sparge Pilot Test at ARCO Station 2035, 1001 San Pablo Avenue, Albany, California" (RESNA Report 69036.10, April 13, 1994).

Water wells 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.

MONITORING PROGRAM FIELD PROCEDURES AND RESULTS

The fourth quarter 1994 groundwater monitoring event was performed by Integrated Wastestream Management (IWM) on November 15, 1994. Field work performed by IWM 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 through MW-6 for laboratory analysis, and (3) directing a state-certified laboratory to analyze the groundwater samples. Well RW-1 contained floating product on November 15, 1994, and was not sampled during fourth quarter 1994. The results of IWM's field work were transmitted to EMCON in a report dated December 16, 1994. These data are presented in Appendix A.

ANALYTICAL PROCEDURES

Groundwater samples collected during fourth quarter 1994 monitoring were analyzed for total petroleum hydrocarbons as gasoline (TPHG), and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Groundwater samples were prepared for analysis by U.S.

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

MONITORING PROGRAM RESULTS

Results of the fourth quarter 1994 groundwater monitoring event are summarized in Table 1 and illustrated in Figure 2. Historical groundwater elevation data, including top-of-casing elevations, depth-to-water measurements, calculated groundwater elevations, floating-product thickness measurements, and groundwater flow direction and gradient data, are summarized in Table 2. Table 3 summarizes historical laboratory data for TPHG and BTEX analyses. Additional historical laboratory data for well MW-3 are summarized in Table 4. Historical floating product recovery data for well RW-1 are summarized in Table 5. Copies of the fourth quarter 1994 analytical results and chain-of-custody documentation are included in Appendix B.

MONITORING PROGRAM EVALUATION

Groundwater elevation data collected on November 15, 1994, illustrate that groundwater beneath the site flows west-southwest with an approximate hydraulic gradient of 0.019 foot per foot. Figure 2 illustrates groundwater contours and analytical data for the fourth quarter 1994.

Groundwater samples collected from wells MW-2, MW-3, MW-5, and MW-6 did not contain detectable concentrations of TPHG or BTEX. Groundwater samples collected from wells MW-1 and MW-4 contained 570 and 220 micrograms per liter (µg/L) TPHG, and 150 and 12 µg/L benzene, respectively. Groundwater samples collected from well MW-3 did not contain detectable concentrations of TRPH. Well RW-1 contained 0.10 foot of floating product and was not sampled during fourth quarter 1994.

LIMITATIONS

Field procedures were performed by, and field data acquired from, IWM. EMCON does not warrant the accuracy of data supplied by IWM. EMCON's scope of work was limited to interpreting field data, which included evaluating trends in the groundwater gradient, groundwater flow direction, and dissolved-petroleum-hydrocarbon concentrations beneath the site.

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 1994 and the first quarter of 1995, and the anticipated site activities for the second quarter of 1995.

Fourth Quarter 1994 Activities

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

First Quarter 1995 Activities

- Performed quarterly groundwater monitoring for first quarter 1995. Based on eight or more consecutive quarters of nondetectable TPHG and BTEX analytical results in monitoring wells MW-2, MW-5, and MW-6, ARCO will begin semiannual sampling at well MW-2 (first and third quarters), and annual sampling at wells MW-5 and MW-6 (first quarter). Wells MW-1, MW-3, MW-4, and RW-1 will continue to be sampled quarterly. Water levels will be measured quarterly in all wells.
- Restarted the SVE system on February 8, 1995.

- Performed initial startup of the groundwater remediation system on February 8, 1995.
- Performed operation and maintenance of the SVE and groundwater remediation systems.
- Shut down the groundwater remediation system on March 3, 1995, because of arsenic level in treated groundwater exceeding the permitted discharge limit.
- Interaction with East Bay Municipal Utility District (EBMUD) to obtain a higher discharge limit for arsenic in treated groundwater.

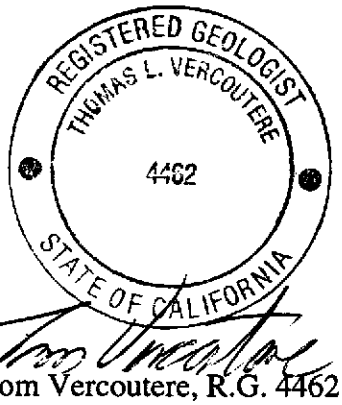
Work Anticipated for Second Quarter 1995

- Prepare and submit quarterly groundwater monitoring report for fourth quarter 1994.
- Prepare and submit quarterly groundwater monitoring report for first quarter 1995.
- Prepare and submit semiannual groundwater remediation system performance report to EBMUD.
- Conduct groundwater sampling for the analysis of arsenic to determine background level of arsenic in groundwater at the sites.
- Submit analytical results of arsenic in groundwater to EBMUD and request a higher discharge limit for arsenic in treated groundwater.
- Reactivate the SVE and groundwater extraction systems.
- Perform quarterly groundwater monitoring for second quarter 1995.

Please call if you have questions.

Sincerely,

EMCON



David Larsen
Project Coordinator

Tom Vercoutere, R.G. 4462
Geologist

Attachments:

Table 1 -	Groundwater Monitoring Data, Fourth Quarter 1994
Table 2 -	Historical Groundwater Elevation Data
Table 3 -	Historical Groundwater Analytical Data (TPHG and BTEX)
Table 4 -	Historical Groundwater Analytical Data (Well MW-3)
Table 5 -	Approximate Cumulative Floating Product Recovered (Well RW-1)
Figure 1 -	Site Location
Figure 2 -	Groundwater Data, Fourth Quarter 1994
Appendix A -	Field Data Report, Integrated Wastestream Management, December 16, 1994
Appendix B -	Analytical Results and Chain-of-Custody Documentation, Fourth Quarter 1994

cc: Barney Chan ACHCSA
Kevin Graves, RWQCB-SFBR

Table 1
Groundwater Monitoring Data
Fourth Quarter 1994
Summary Report

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

Date: 05-26-95
Project Number: 0805-123.01

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot	Water Sample Field Date	TPHG µg/l	Benzene µg/l	Toluene µg/l	Ethyl-benzene µg/l	Total Xylenes µg/l
MW-1	11-15-94	41.41	8.76	32.65	ND	WSW	0.019	11-15-94	570	150	7.3	<2.5	30
MW-2	11-15-94	40.38	9.23	31.15	ND	WSW	0.019	11-15-94	<50	<0.5	<0.5	<0.5	<0.5
MW-3	11-15-94	41.44	9.25	32.19	ND	WSW	0.019	11-15-94	<50	<0.5	<0.5	<0.5	<0.5
MW-4	11-15-94	40.33	8.47	31.86	ND	WSW	0.019	11-15-94	220	12	19	0.9	39
MW-5	11-15-94	41.84	9.10	32.74	ND	WSW	0.019	11-15-94	<50	<0.5	<0.5	<0.5	<0.5
MW-6	11-15-94	40.13	11.01	29.12	ND	WSW	0.019	11-15-94	<50	<0.5	<0.5	<0.5	<0.5
RW-1	11-15-94	40.33	8.89	** 31.51	0.10	WSW	0.019	11-15-94	Not sampled: well contained floating product				

TOC = Top of casing
ft-MSL = Elevation in feet, relative to mean sea level
MWN = Ground-water flow direction and gradient apply to the entire monitoring well network
TPHG = Total petroleum hydrocarbons as gasoline
µg/l = Micrograms per liter
ND = None detected
WSW = West-southwest
** [Corrected elevation (Z')] = Z + (h * 0.73) where: Z = measured elevation, h = floating product thickness, 0.73 = density ratio of oil to water

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Table 2
Historical Groundwater Elevation Data
Summary Report

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

Date: 05-26-95
Project Number: 0805-123.01

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-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

Table 2
Historical Groundwater Elevation Data
Summary Report

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

Date: 05-26-95
Project Number: 0805-123.01

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-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

Table 2
Historical Groundwater Elevation Data
Summary Report

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

Date: 05-26-95
Project Number: 0805-123.01

Well Desig-nation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-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

Table 2
Historical Groundwater Elevation Data
Summary Report

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

Date: 05-26-95
Project Number: 0805-123.01

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot
MW-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-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-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

Table 2
Historical Groundwater Elevation Data
Summary Report

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

Date: 05-26-95
Project Number: 0805-123.01

Well Desig-nation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
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

TOC = Top of casing
ft-MSL = Elevation in feet, relative to mean sea level
MWN = Ground-water flow direction and gradient apply to the entire monitoring well network
ND = None detected
NR = Not reported; data not available
WSW = West-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
Summary Report

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

Date: 05-26-95
Project Number: 0805-123.01

Well Designation	Water Sample Field Date	TPHG µg/l	Benzene µg/l	Toluene µg/l	Ethyl-benzene µg/l	Total Xylenes 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-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

Table 3
Historical Groundwater Analytical Data
Summary Report

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

Date: 05-26-95
Project Number: 0805-123.01

Well Designation	Water Sample Field Date	TPHG µg/l	Benzene µg/l	Toluene µg/l	Ethyl-benzene µg/l	Total Xylenes µg/l
MW-3	10-29-91	32	2.1	2.8	0.35	1.8
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
MW-3	01-13-93	<50	1.1	<0.5	<0.5	<0.5
MW-3	04-13-93	68	13	<0.5	1.6	1.1
MW-3	08-24-93	<50	<0.5	<0.5	<0.5	<0.5
MW-3	12-08-93	<50	<0.5	<0.5	<0.5	<0.5
MW-3	02-01-94	<50	1.9	<0.5	2.1	<0.5
MW-3	04-26-94	<50	1.1	<0.5	2.4	0.9
MW-3	07-29-94	<50	<0.5	<0.5	<0.5	<0.5
MW-3	11-15-94	<50	<0.5	<0.5	<0.5	<0.5
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

Table 3
Historical Groundwater Analytical Data
Summary Report

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

Date: 05-26-95
Project Number: 0805-123.01

Well Designation	Water Sample Field Date	TPHG µg/l	Benzene µg/l	Toluene µg/l	Ethyl-benzene µg/l	Total Xylenes 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-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
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				

TPHG = Total petroleum hydrocarbons as gasoline
µg/l = Micrograms per liter

Table 4
Historical Groundwater Analytical Data
Summary Report

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

Date: 05-26-95
Project Number: 0805-123.01

Well Designation	Water Sample Field Date	TPHD µg/l	TOG or TRPH µg/l	VOCs µg/l	BNAs µg/l	PCBs µg/l	Cadmium by EPA 6010 µg/l	Chromium by EPA 6010 µg/l	Lead by EPA 7421 µg/l	Zinc by EPA 6010 µg/l	Nickel by EPA 6010 µg/l
MW-3	10-29-91	NA	<5000(a)	ND(e)	NA	NA	<10	<10	<5	45	<50
MW-3	03-19-92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	06-12-92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	09-08-92	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	10-26-92	<50	600(b), 600(c)	ND(f)	NA	NA	NA	NA	NA	NA	NA
MW-3	12-01-92	NA	NA	NA	ND(g)	ND(h)	NA	NA	NA	NA	NA
MW-3	01-13-93	NA	780(b), 1100(c)	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	04-13-93	NA	<500(b), <500(c)	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	08-24-93	NA	<500(b), <500(c)	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	12-08-93	NA	900(b), 500(c)	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	02-01-94	NA	<500(b), <500(c)	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	04-26-94	NA	<600(d)	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	07-29-94	NA	600(d)	NA	NA	NA	NA	NA	NA	NA	NA
MW-3	11-15-94	NA	<500(d)	NA	NA	NA	NA	NA	NA	NA	NA

TPHD = Total petroleum hydrocarbons as diesel by EPA Method 3510/California DHS LUFT Method
TOG = Total oil and grease analyzed using Standard Method: a) 5520B&F or, b) 5520C and c) 5520F
TRPH = Total recoverable petroleum hydrocarbons analyzed using: d) EPA Method 418.1
VOCs = Volatile organic compounds analyzed using EPA Method 624
BNAs = Semi-volatile organic compounds analyzed using EPA Method 3510/8270
PCBs = Polychlorinated biphenyls analyzed using EPA Method 3510/8080
µg/l = Micrograms per liter
NA = Not analyzed
ND = Not detected (31 compounds tested for VOCs were nondetectable)
e = All 37 compounds analyzed were nondetectable except for toluene (3.0 ppb)
f = All 41 compounds analyzed were nondetectable
g = All 34 compounds analyzed were nondetectable
h = All 7 compounds analyzed were nondetectable

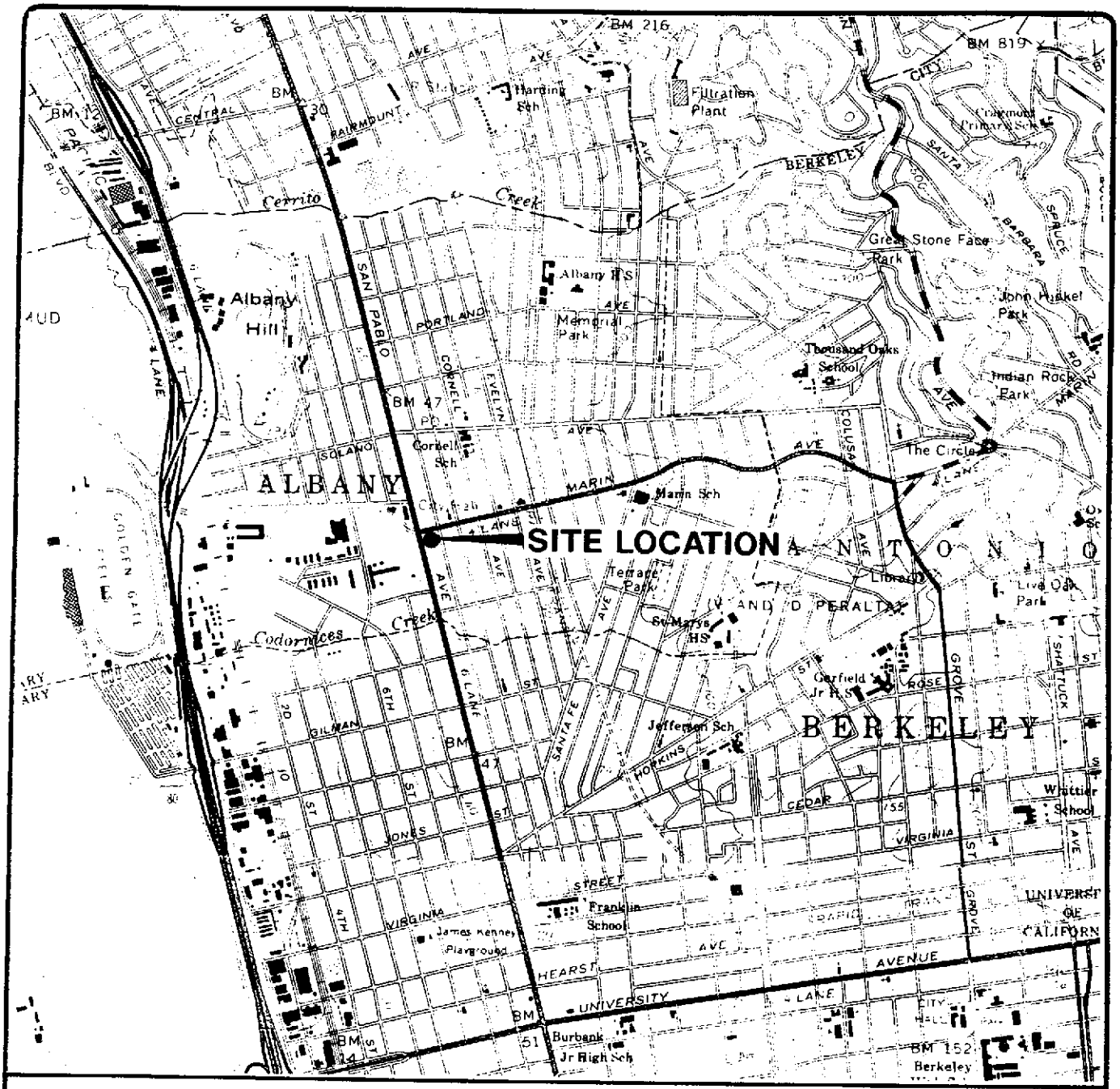
Table 5
Approximate Cumulative Floating Product Recovered
Summary Report

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

Date: 05-26-95
Project Number: 0805-123.01

Well Designation	Date	Floating Product Recovered gallons
RW-1	1992	22.3
RW-1	1993	1.0
RW-1	1994	0.0
	1992 to 1994 Total:	23.3

152753



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

CALIF

Scale : 0 2000 4000 Feet

N

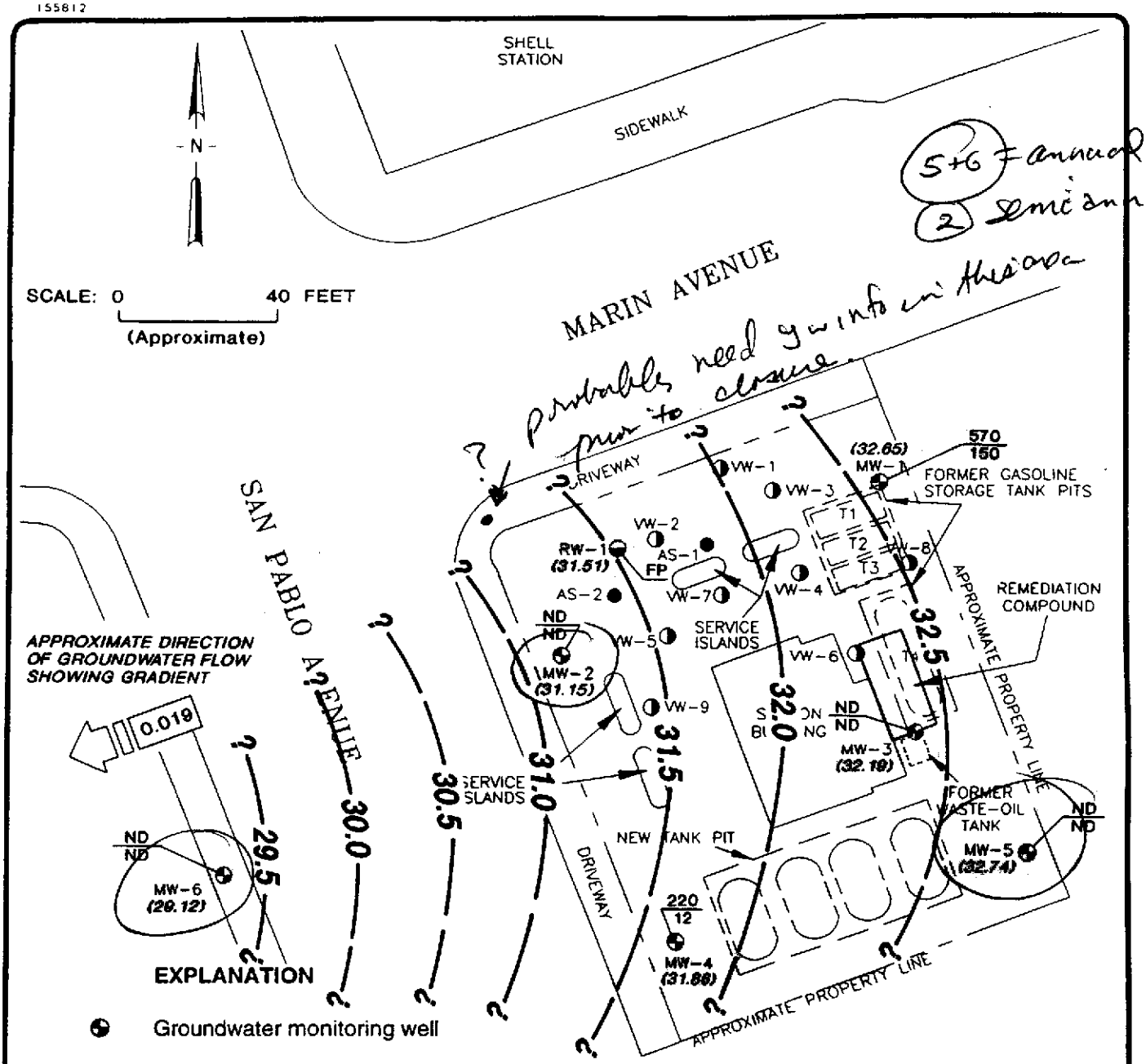
EMCON Associates

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

SITE LOCATION

FIGURE
1
PROJECT NO.
805-123.01

155812



Base map modified from RESNA, 1994.

EMCON Associates

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

GROUNDWATER DATA
FOURTH QUARTER 1994

FIGURE 2

PROJECT NO. 805-123.01

APPENDIX A

FIELD DATA REPORT, INTEGRATED WASTESTREAM MANAGEMENT, DECEMBER 16, 1994

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

December 16, 1994

John Young
EMCON Associates
1921 Ringwood Avenue
San Jose, CA 95131

Dear Mr. Young:

Attached are the field data sheets and analytical results for quarterly ground water sampling at ARCO Facility No. 2035 in Albany, California. Integrated Wastestream Management measured the depth to water and collected samples from wells at this site on November 15, 1994.

Sampling was carried out in accordance with the protocols described in the "Request for Bid for Quarterly Sampling at ARCO Facilities in Northern California".

Please call us if you have any questions.

Sincerely,
Integrated Wastestream Management

Tom DeLon
Project Manager

Walter H. Howe
Registered Geologist

REGISTERED GEOLOGIST
WALTER H. HOWE
No. 730
Exp. 4/'96
STATE OF CALIFORNIA

EMCON ASSOCIATES
DEC 28 1994
RECEIVED

950 AMES AVENUE MILPITAS, CA 95035 (408) 942-8955

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

A2035Q4.XLS

Summary of Ground Water Sample Analyses for ARCO Facility A-2035, Albany, California

WELL NUMBER	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	RW-1
DATE SAMPLED	11/15/94	11/15/94	11/15/94	11/15/94	11/15/94	11/15/94	11/15/94
DEPTH TO WATER	8.76	9.23	9.25	8.47	9.10	11.01	8.89
SHEEN	NONE	NONE	NONE	NONE	NONE	NONE	FP
PRODUCT THICKNESS	NA	NA	NA	NA	NA	NA	0.10
TPHg	570	ND	ND	220	ND	ND	NA
BTEX							
BENZENE	150	ND	ND	12	ND	ND	NA
TOLUENE	7.3	ND	ND	19	ND	ND	NA
ETHLYBENZENE	<2.5#	ND	ND	0.9	ND	ND	NA
XYLENES	30	ND	ND	39	ND	ND	NA
EPA 418.1	NA	NA	ND	NA	NA	NA	NA

FOOTNOTES:

Concentrations reported in ug/L (ppb)
TPHg = Total Purgeable Petroleum Hydrocarbons (USEPA Method 8015 Modified)
BTEX Distinction (USEPA Method 8020)
PCE = Tetrachloroethene (USEPA Method 8010)
* = Well inaccessible

** = Not sampled per consultant request
DCE = cis-1, 2-Dichloroethene (USEPA Method 8010)
TCE = Trichloroethene (USEAP Method 8010)
ND = Not Detected
NA = Not applicable
FP = Floating product
# = See laboratory analytical report

950 AMES AVENUE MILPITAS, CA 95035 (408) 942-8955

FIELD REPORT

Depth To Water / Floating Product Survey

Site Arrival Time: 1300
Site Departure Time: 1730
Weather Conditions: Cloudy
NEDC Ordinary Prod.

DTW: Well Box or Well Casing (circle one).

Project No.: _____ **Location:** 1001 San Pablo Ave. Alb. **Date:** November 15, 1994

Client / Station#: Arco 2035 **Field Technician:** Vince/Cisco **Day of Week:** Tuesday

DTW ORDER	WELL ID	SURFACE SEAL	LID SECURE	GASKET	LOCK	EXPANDING CAP	TOTAL DEPTH (Feet)	FIRST DEPTH TO WATER (Feet)	SECOND DEPTH TO WATER (Feet)	DEPTH TO FLOATING PRODUCT (Feet)	FLOATING PRODUCT THICKNESS (Feet)	SHEEN (Y=YES, N=NO) FP=FLOATING PRODUCT	COMMENTS	MATERIALS
6	mw-1	OK	~~Yes~~	OK	22	OK	30.10	8.76	8.76	N/A	N/A	N	4"	15/16
1	mw-2	OK	Yes	OK	22	OK	29.10	9.23	9.23	N/A	N/A	N	4"	15/16
5	mw-3	OK	Yes	OK	22	OK	33.55	9.25	9.25	N/A	N/A	N	4"	15/16
2	mw-4	OK	Yes	OK	22	OK	2580	8.47-	8.47-	N/A	N/A	N	4"	15/16
3	mw-5	OK	Yes	OK	22	OK	25.10	9.10	9.10	N/A	N/A	N	4"	15/16
4	mw-6	OK	Yes	OK	22	OK	24.80	11.01	11.01	N/A	N/A	N	2" sidewalk	15/16
7	RW-1	OK	Yes	OK	OK	OK	25.40	8.89	8.89	8.79	0.10	Y	6"	3/4

PAGE 2 OF 3 DATE: 11-15-94 CLIENT/STATION #: ARCO 7035 ADDRESS: 1001 San Pablo Ave. Alb.

WELL ID: MW-5 TD 25.10 DTW 9.10 x 0.66 (Gal./Linear Ft.) x 3 (Casing Volume) - 31.68 (Calculated Purge)

DATE PURGED: 11-15-94 START (2400 HR): 1518 END (2400 HR) 1526
DATE SAMPLED: 11-15-94 TIME (2400 HR): 1530 DTW: 21.2

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1519	5	7.01	3.89	63.7	CLEAR
1521	17	7.01	3.98	67.3	CLEAR
1523	24	7.04	0.38	66.9	CLOUDY
1526	29	7.02	0.38	66.3	CLOUDY

Total purge: 29
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: WELL PUMPED DRY AT 29 GALLONS.

WELL ID: MW-4 TD 25.80 DTW 8.47 x 0.66 (Gal./Linear Ft.) x 3 (Casing Volume) - 34.31 (Calculated Purge)

DATE PURGED: 11-15-94 START (2400 HR): 1542 END (2400 HR) 1549
DATE SAMPLED: 11-15-94 TIME (2400 HR): 1555 DTW: 19

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1544	5	7.31	0.61	68.1	CLEAR
1546	15	7.28	0.57	67.7	CLEAR
1548	25	7.25	0.65	67.3	CLEAR
1549	27	7.24	0.69	67.0	CLEAR

Total purge: 27
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: WELL PUMPED DRY AT 27 GALLONS

WELL ID: MW-2 TD 29.10 DTW 9.23 x 0.66 (Gal./Linear Ft.) x 3 (Casing Volume) - 39.34 (Calculated Purge)

DATE PURGED: 11-15-94 START (2400 HR): 1607 END (2400 HR) 1617
DATE SAMPLED: 11-15-94 TIME (2400 HR): 1620 DTW: 12.5

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1609	5	7.27	3.19	68.2	CLEAR
1612	18	7.35	2.12	67.7	CLEAR
1615	29	7.33	0.87	67.2	CLEAR
1617	39.5	7.30	0.72	66.7	CLEAR

Total purge: 39.5
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-6 TD 24.80 DTW 11.01 x 0.17 (Gal./Linear Ft.) x 3 (Casing Volume) - 7.03 (Calculated Purge)

DATE PURGED: 11-15-94 START (2400 HR): 1701 END (2400 HR) 1705
DATE SAMPLED: 11-15-94 TIME (2400 HR): 1711 DTW: 15.7

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1703	1	7.45	0.61	66.6	CLOUDY
1704	4	7.41	0.64	67.7	CLEAR
1705	7	7.39	0.65	63.4	CLEAR

Total purge: 7
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

PRINT NAME: Francisco Arriaga SIGNATURE: Francisco Arriaga

CASING DIAMETER (inches): 2 3 4 6 8 12 Other:
GALLON/LINEAR FOOT: 0.17 0.38 0.66 1.5 2.6 5.8 Other:

PAGE 3 OF 3 DATE: 11-15-94 CLIENT/STATION #: ARCO 2035 ADDRESS: 1001 San Pablo Ave. Albany

WELL ID: MW-3 TD 33.55 - DTW 9.25 X 0.66 (Gal./Linear Ft.) X 3 (Casing Volume) = 48.11 (Calculated Purge)

DATE PURGED: 11-15-94 START (2400 HR): 1538 END (2400 HR) 1554
DATE SAMPLED: 11-15-94 TIME (2400 HR): 1558 DTW: 15.8

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1541	6	7.88	0.62	66.9	cloudy
1543	16	7.61	0.63	65.9	clear
1547	34	7.50	0.64	65.7	clear
1558	50	7.12	0.57	65.6	clear/cloudy
Total purge: 1559	51	7.11	0.57	65.4	cloudy

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp
REMARKS:

WELL ID: MW-1 TD 30.10 - DTW 8.76 X 0.66 (Gal./Linear Ft.) X 3 (Casing Volume) = 42.35 (Calculated Purge)

DATE PURGED: 11-15-94 START (2400 HR): 1627 END (2400 HR) 1640
DATE SAMPLED: 11-15-94 TIME (2400 HR): 1644 DTW: 13.2

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1633	13	6.91	0.57	66.7	clear
1635	24	7.18	0.64	66.5	clear
1638	36	7.21	0.67	66.3	clear
1640	42	7.20	0.68	66.1	clear

Total purge: 42
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp
REMARKS:

WELL ID: _____ TD _____ - DTW _____ X Gal./Linear Ft. _____ X Casing Volume _____ = Calculated Purge _____

DATE PURGED: _____ START (2400 HR): _____ END (2400 HR) _____
DATE SAMPLED: _____ TIME (2400 HR): _____ DTW: _____

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)

Total purge: _____
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: _____ TD _____ - DTW _____ X Gal./Linear Ft. _____ X Casing Volume _____ = Calculated Purge _____

DATE PURGED: _____ START (2400 HR): _____ END (2400 HR) _____
DATE SAMPLED: _____ TIME (2400 HR): _____ DTW: _____

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)

Total purge: _____
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

PRINT NAME: Vince Valdes VINCE VALDES SIGNATURE: Vince Valdes

CASING DIAMETER (inches): 2 3 4 6 8 12 Other: _____

GALLON/LINEAR FOOT: 0.17 0.38 0.66 1.5 2.6 5.8 Other: _____

APPENDIX B

ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY DOCUMENTATION, FOURTH QUARTER 1994

Columbia Analytical Services INC.

December 2, 1994

Service Request No. S941463

Gina Austin
Tom DeLon
IWM
950 Ames Avenue
Milpitas, CA 95035

Re: **ARCO Facility No. 2035**

Dear Ms. Austin/Mr. DeLon:

Attached are the results of the water samples submitted to our lab on November 16, 1994. For your reference, these analyses have been assigned our service request number S941463.

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

Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.

Keoni A. Murphy
Program Director

Annelise J. Bazar
Regional QA Coordinator

KAM/ajb

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Acronyms

ASTM	American Society for Testing and Materials
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MRL	Method Reporting Limit
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected at or above the MRL
NR	Not Requested
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
VPH	Volatile Petroleum Hydrocarbons

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	IWM	**Service Request:**	S941463
Project:	ARCO Facility No. 2035	**Date Collected:**	11/15/94
Sample Matrix:	Water	**Date Received:**	11/16/94
		Date Extracted:	NA
		Date Analyzed:	11/28/94

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

Analyte:	**TPH as Gasoline**	**Benzene**	**Toluene**	**Ethyl-benzene**	**Xylenes, Total**
Units:	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
Method Reporting Limit:	50	0.5	0.5	0.5	0.5
Sample Name	**Lab Code**				
MW-1 (13.2)	S941463-001	570	150	7.3	<2.5 *	30
MW-2 (12.5)	S941463-002	ND	ND	ND	ND	ND
MW-3 (15.8)	S941463-003	ND	ND	ND	ND	ND
MW-4 (19)	S941463-004	220	12	19	0.9	39
MW-5 (21.2)	S941463-005	ND	ND	ND	ND	ND
MW-6 (15.7)	S941463-006	ND	ND	ND	ND	ND
Method Blank	S941128-WB	ND	ND	ND	ND	ND

Approved By: Kevin A Murphy Date: December 2, 1994

5ABTXGAS/061694

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APPENDIX A

LABORATORY QC RESULTS

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Service Request:**	S941463
Project:	ARCO Facility No. 2035	**Date Collected:**	11/15/94
Sample Matrix:	Water	**Date Received:**	11/16/94
		Date Extracted:	NA
		Date Analyzed:	11/28/94

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

Sample Name	Lab Code	Percent Recovery α,α,α-Trifluorotoluene
MW-1 (13.2)	S941463-001	101
MW-2 (12.5)	S941463-002	104
MW-3 (15.8)	S941463-003	106
MW-4 (19)	S941463-004	106
MW-5 (21.2)	S941463-005	105
MW-6 (15.7)	S941463-006	102
MW-2 (12.5) MS	S941463-002MS	109
MW-2 (12.5) DMS	S941463-002DMS	109
Method Blank	S941128-WB	102

CAS Acceptance Limits: 69-116

Approved By: Kevin A Murphy Date: December 2, 1994

SUR1/062994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 2035

Service Request: S941463
Date Analyzed: 11/28/94

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

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	25.9	104	85-115
Toluene	25	27.0	108	85-115
Ethylbenzene	25	27.5	110	85-115
Xylenes, Total	75	76.8	102	85-115
Gasoline	250	499	100	90-110

Approved By: Kevin A Murphy Date: December 2, 1994

ICV25AL/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 2035
Sample Matrix: Water

Service Request: S941463
Date Collected: 11/15/94
Date Received: 11/16/94
Date Extracted: NA
Date Analyzed: 11/28/94

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

Sample Name: MW-2 (12.5)
Lab Code: S941463-002

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
Benzene	25	25	ND	24.3	24.2	97	97	75-135	<1
Toluene	25	25	ND	26.6	26.1	106	104	73-136	2
Ethylbenzene	25	25	ND	27.4	27.3	110	109	69-142	<1

Approved By: _____ Date: December 8, 1994

DMS1S/060194

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APPENDIX B

CHAIN OF CUSTODY

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

ARCO Products Company
Division of AtlanticRichfieldCompany

Chain of Custody

Task Order No. IWM-94-5CC

ARCO Facility no. A2035	City (Facility) Oakland	Project manager (Consultant) Tom DeMoss / R. Davis	Laboratory name Columbia
ARCO engineer M.W.	Telephone no. (ARCO) 915 571 2434	Telephone no. (Consultant) 408/942 8555	Fax no. (Consultant) 408/942 1499
Consultant name IWM. EMCON	Address (Consultant) 950 Ames Ave. 1921 Ringwood Ave. S.J		Contract number 07077

Method of shipment: Sampler Deliver

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 ☐		
FB-1	7	2		✓		✓	✓ HCl	11-15-94	1330		✓	✓										
13.2 MW-1	1	2		✓		✓	✓		1644		✓	✓										
12.5 MW-2	2	2		✓		✓	✓		1620		✓	✓										
15.8 MW-3	3	2+2		✓		✓	✓		1558		✓	✓		✓								
19 MW-4	4	2		✓		✓	✓		1555		✓	✓										
21.2 MW-5	5	2		✓		✓	✓		1530		✓	✓										
15.7 MW-6	6	2		✓		✓	✓	6	1711		✓	✓										

Special detection Limit/reporting

Special QA/QC

Remarks: Add 5m on FB-1

Lab number 5941463

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 11/16/94 Time 10:45A	Received by	11-16-94 10:45A
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory	Date Time

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

65; 418.1

GOLDEN STATE/CAS
LABORATORIES, INC.

November 21, 1994

Tom Delon
IWM
950 Ames Ave.
Milpitas, CA 95035

Re: **ARCO Facility #2035-Albany**

Dear Tom:

Enclosed are the results of the sample submitted to our lab on November 18, 1994. For your reference, these analyses have been assigned our service request number L943603.

All analyses were performed in accordance with our laboratory's quality assurance program. Golden State / CAS is certified for environmental analyses by the California Department of Health Services (Certificate # 1296/Expiration - December 1994).

Please call if you have any questions.

Respectfully submitted,

Golden State / CAS Laboratories, Inc.

Elaine R. Thomas for
Dr. B. Gene Bennett
Laboratory Director

Thomas X. Robinson
Thomas X. Robinson
Quality Assurance Coordinator

GB/iz

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

GOLDEN STATE / CAS LABORATORIES, INC.

Analytical Report

Client:	IWM	**Date Collected:**	11/15/94
Project:	ARCO Products Company/#2035	**Date Received:**	11/18/94
Sample Matrix:	Water	**Date Extracted:**	11/18/94
		Date Analyzed:	11/18/94
		Service Request No.:	L943603

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

Sample Name	Lab Code	MRL	Result
MW-3	L943603-001	0.5	ND
Method Blank	L943603-MB	0.5	ND

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

0001

Approved by Elaine R Thomas Date 11-21-94

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

GOLDEN STATE / CAS LABORATORIES, INC.

QA/QC Report

Client: IWM
Project: ARCO Products Company/#2035
LCS Matrix: Water

Date Extracted: 11/18/94
Date Analyzed: 11/18/94
Service Request No.: L943603

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

Analyte	True Value		Result		Percent Recovery		EPA Acceptance Criteria	Relative Percent Difference
	LCS	DLCS	LCS	DLCS	LCS	DLCS		
TRPH	1.90	1.90	1.86	1.75	98	92	75-125	6

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

Approved by Elaine R. Thomas Date 11/23/94

0002

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. IWM-94-5CC

Chain of Custody

ARCO Facility no. A2035	City (Facility) Alameda	Project manager (Consultant) Tom DeLoon / R. Davis	Laboratory name Columbia
ARCO engineer M.W.	Telephone no. (ARCO) 415 571 2434	Telephone no. (Consultant) 408/942 8955	Fax no. (Consultant) 408/942 1499
Consultant name IWM. EMCON	Address (Consultant) 950 Almaden Av. #921 Pinguood Av. S.J.		Contract number 07077

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid HCl	Sampling date 11-15-94	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 ☐		418.1
FB-1	7	2		✓		✓	✓	11-15-94	1330		✓	✓										
13.2 MW-1	1	2		✓		✓	✓		1644		✓	✓										
12.5 MW-2	2	2		✓		✓	✓		1620		✓	✓										
5.8 MW-3	3	2+2		✓		✓	✓		1558		✓	✓		✓								1
19 MW-4	4	2		✓		✓	✓		1555		✓	✓										
11.2 MW-5	5	2		✓		✓	✓		1530		✓	✓										
5.7 MW-6	6	2		✓		✓	✓	6 6	1711		✓	✓										

Remarks
Add Oxy on FB-1

L943603

Special detection Limit/reporting

Special QA/QC

Method of shipment Sampler Deliver

Lab number 5941463

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 11/16/94 Time 10:45A	Received by	11-16-94 10:45A
Relinquished by	Date 11/17/94 Time 1600	Received by	
Relinquished by	Date Time	Received by laboratory	Date 11-18-94 Time 1030

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

65; 418.1