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

Date: December 30, 1994
Project: 0805-132.01

To:

Ms. Eva Chu
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

>120 days to get ample

We are enclosing:

7249 Village Pkwy

Copies	Description
1	Third quarter 1994 groundwater monitoring report
	for ARCO service station 6041, Deblin, California

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

Comments:

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

David Larsen
Project Coordinator

1/13/95. Discussed w/ S. Seery. Perhaps flat gradient accts for weird flow directions. May be best to just watch for trend, if biodegradation will take care of problem

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

Copy tranmsmittal and Table 2 only:
Scott T. Hooton, BP Oil Company

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0805-132.01

ARCO Products Company
2000 Alameda de las Pulgas
Mailing Address: Box 5811
San Mateo, California 94402
Telephone 415 571 2400

Date:

December 30, 1994

Re: ARCO Station #

6041 • 7249 Village Parkway • Dublin, CA
Third 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

Michael R. Whelan
Environmental Engineer

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

December 30, 1994
Project 0805-132.01

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

Re: Third quarter 1994 groundwater monitoring program results, ARCO service station 6041, Dublin, California

Dear Mr. Whelan:

This letter presents the results of the third quarter 1994 groundwater monitoring program at ARCO Products Company (ARCO) service station 6041, 7249 Village Parkway, Dublin, California (Figure 1). The quarterly monitoring program complies with Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

BACKGROUND

In June 1990, a waste-oil tank was removed from the site. In September 1991, RESNA conducted an initial subsurface environmental investigation to evaluate the impact of a gasoline spill beneath a gasoline dispenser pump. This investigation included installation of three groundwater monitoring wells (MW-1 through MW-3) beneath the tank pit to assess the presence of hydrocarbons.

Between October and November 1992, a second phase of investigation was conducted by RESNA which included installation of three additional groundwater monitoring wells (MW-4 through MW-6) and four vadose wells (VW-1 through VW-4) in October 1992, and soil-vapor extraction (SVE) pilot testing in November 1992.

Between August 1993 and February 1994, a third phase of investigation was conducted by RESNA which included additional on-site subsurface investigation to evaluate potential sources of gasoline hydrocarbons in soil to aid in the design of an interim SVE and air sparge (AS) systems, installation of one vadose well (VW-5) and two air sparge wells (AS-1 and AS-2), and AS pilot testing.

Groundwater monitoring and sampling at this site was initiated in September 1991. Currently, six groundwater monitoring wells, five vadose wells and two air sparge wells exist on site. For additional background information, please refer to *Report of Findings, Air Sparge Pilot Test*, (RESNA, June 10, 1994).

Wells MW-1 through MW-6 are monitored quarterly.

MONITORING PROGRAM FIELD PROCEDURES AND RESULTS

The third quarter 1994 groundwater monitoring event was performed by Integrated Wastestream Management, Inc. (IWM), on August 25, 1994. Field work performed by IWM during 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, (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. The results of IWM's field work were transmitted to EMCON in a report dated September 19, 1994. These data are presented in Appendix A.

ANALYTICAL PROCEDURES

Groundwater samples collected during third quarter 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 (EPA) method 5030 (purge and trap). Groundwater was analyzed for TPHG by the methods accepted by the Department of Toxic Substances Control, California EPA (Cal-EPA), and referenced in the *Leaking Underground Fuel Tank (LUFT) Field Manual* (State Water Resources Control Board, May 1988, revised October 1989). Samples were analyzed for BTEX by EPA method 8020, as described in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (EPA, SW-846, November 1986, Third Edition). These methods are recommended for samples from petroleum-hydrocarbon-impacted sites in the *Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites* (August 10, 1990).

MONITORING PROGRAM RESULTS

Results of the third 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. Table 4 summarizes historical groundwater elevation data for the BP station located at 7197 Village Parkway, the former Shell station located at 7194 Amador Valley Boulevard, and the UNOCAL station located at 7375 Amador Valley Boulevard. Figure 3 illustrates vicinity groundwater elevation data for all four service stations (ARCO, BP, Shell, and UNOCAL) during the third quarter of 1994. Copies of the third

quarter 1994 certified analytical report and chain-of-custody documentation are included in Appendix B.

MONITORING PROGRAM EVALUATION

On-site groundwater contours and analytical data for the third quarter of 1994 are presented in Figure 2. An approximate direction of groundwater flow and hydraulic gradient could not be determined based on the groundwater elevation data collected at the site during the third quarter of 1994. An approximate direction of groundwater flow and gradient for the site vicinity were calculated using groundwater elevation data collected from the UNOCAL, ARCO, and former Shell service stations during the August 25, 1994, cooperative sampling event. Based on this data groundwater in the site vicinity flows east-southeast at an approximate hydraulic gradient of 0.005 foot per foot (Figure 3).

Groundwater samples collected from wells MW-2, MW-4, MW-5, and MW-6 did not contain detectable concentrations of TPHG or BTEX. Groundwater samples collected from wells MW-1 and MW-3 contained 880 and 100 parts per billion (ppb) TPHG, and 2.4 and 4.3 ppb benzene, respectively. Similar analytical results were reported for these wells during previous monitoring events.

LIMITATIONS

Field procedures were performed by, and field data were 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/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 third quarter of 1994 and the anticipated site activities for the fourth quarter of 1994.

Third Quarter 1994 Activities

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

Work Anticipated Fourth Quarter 1994

- Prepare and submit quarterly groundwater monitoring report for third quarter 1994.
- Perform quarterly groundwater monitoring for fourth quarter 1994.

Please call if you have questions.

Sincerely,

EMCON Associates

David Larsen
Sampling Coordinator

Mark Smolley, R.G. 4650
Senior Project Geologist

Attachment:
Table 1 - Groundwater Monitoring Data, Third Quarter 1994
Table 2 - Historical Groundwater Elevation Data
Table 3 - Historical Groundwater Analytical Data (TPHG and BTEX)
Table 4 - Historical Groundwater Elevation Data (BP, Shell, and UNOCAL Stations)
Figure 1 - Site Location
Figure 2 - Groundwater Data, Third Quarter 1994
Figure 3 - Vicinity Groundwater contours (ARCO, BP, Shell, and UNOCAL Stations)
Appendix A - Field Data Report, Integrated Wastestream Management, September 19, 1994
Appendix B - Certified Analytical Report and Chain-of-Custody Documentation, Third Quarter 1994

Table 1
Groundwater Monitoring Data
Third Quarter 1994
Summary Report

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Date: 12-06-94
Project Number: 0805-132.01

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 ppb	Benzene ppb	Toluene ppb	Ethyl-benzene ppb	Total Xylenes ppb
MW-1	08-25-94	336.56	10.11	326.45	ND	NR	NR	08-25-94	880	2.4	<1	4.6	<1
MW-2	08-25-94	334.80	9.23	325.57	ND	NR	NR	08-25-94	<50	<0.5	<0.5	<0.5	<0.5
MW-3	08-25-94	335.53	11.09	324.44	ND	NR	NR	08-25-94	100	4.3	<0.5	1.1	<0.5
MW-4	08-25-94	334.22	8.79	325.43	ND	NR	NR	08-25-94	<50	<0.5	<0.5	<0.5	<0.5
MW-5	08-25-94	335.87	10.23	325.64	ND	NR	NR	08-25-94	<50	<0.5	<0.5	<0.5	<0.5
MW-6	08-25-94	335.84	10.39	325.45	ND	NR	NR	08-25-94	<50	<0.5	<0.5	<0.5	<0.5

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
ppb = Parts per billion or micrograms per liter (µg/l)
ND = None detected
NR = Not reported; data not available or not measurable

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Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Date: 12-06-94
Project Number: 0805-132.01

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-1	09-20-91	336.56	11.20	325.36	ND	NR	NR
MW-1	10-22-91	336.56	11.48	325.08	ND	NR	NR
MW-1	11-27-91	336.56	11.27	325.29	ND	NR	NR
MW-1	12-16-91	336.56	11.55	325.01	ND	NR	NR
MW-1	01-18-92	336.56	11.37	325.19	ND	NR	NR
MW-1	02-21-92	336.56	9.13	327.43	ND	NR	NR
MW-1	03-16-92	336.56	9.70	326.86	ND	NR	NR
MW-1	04-24-92	336.56	10.20	326.36	ND	NR	NR
MW-1	05-15-92	336.56	10.46	326.10	ND	NR	NR
MW-1	06-09-92	336.56	10.73	325.83	ND	NR	NR
MW-1	07-28-92	336.56	11.04	325.52	ND	NR	NR
MW-1	08-24-92	336.56	11.32	325.24	ND	NR	NR
MW-1	09-09-92	336.56	11.54	325.02	ND	NR	NR
MW-1	10-26-92	336.56	11.80	324.76	ND	NR	NR
MW-1	11-10-92	336.56	11.74	324.82	ND	NR	NR
MW-1	12-14-92	336.56	10.77	325.79	ND	NR	NR
MW-1	01-15-93	336.56	8.88	327.68	ND	NR	NR
MW-1	02-10-93	336.56	9.66	326.90	ND	NR	NR
MW-1	03-29-93	336.56	8.31	328.25	ND	NR	NR
MW-1	04-27-93	336.56	9.03	327.53	ND	NR	NR
MW-1	05-10-93	336.56	9.50	327.06	ND	NR	NR
MW-1	06-18-93	336.56	10.16	326.40	ND	NR	NR
MW-1	07-28-93	336.56	10.68	325.88	ND	NR	NR
MW-1	08-30-93	336.56	10.59	325.97	ND	NR	NR
MW-1	09-28-93	336.56	10.82	325.74	ND	NR	NR
MW-1	10-31-93	336.56	10.94	325.62	ND	NR	NR
MW-1	11-11-93	336.56	10.70	325.86	ND	NR	NR
MW-1	12-15-93	336.56	10.56	326.00	ND	NR	NR
MW-1	02-11-94	336.56	10.35	326.21	ND	NR	NR
MW-1	03-13-94	336.56	9.99	326.57	ND	NR	NR
MW-1	05-17-94	336.56	9.82	326.74	ND	NR	NR
MW-1	08-25-94	336.56	10.11	326.45	ND	NR	NR
MW-1	09-22-94	336.56	11.20	325.36	ND	NR	NR

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Date: 12-06-94
Project Number: 0805-132.01

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	09-20-91	334.80	9.22	325.58	ND	NR	NR
MW-2	10-22-91	334.80	9.66	325.14	ND	NR	NR
MW-2	11-27-91	334.80	9.48	325.32	ND	NR	NR
MW-2	12-16-91	334.80	9.76	325.04	ND	NR	NR
MW-2	01-18-92	334.80	9.47	325.33	ND	NR	NR
MW-2	02-21-92	334.80	7.62	327.18	ND	NR	NR
MW-2	03-16-92	334.80	7.84	326.96	ND	NR	NR
MW-2	04-24-92	334.80	8.34	326.46	ND	NR	NR
MW-2	05-15-92	334.80	8.62	326.18	ND	NR	NR
MW-2	06-09-92	334.80	8.88	325.92	ND	NR	NR
MW-2	07-28-92	334.80	9.38	325.42	ND	NR	NR
MW-2	08-24-92	334.80	9.81	324.99	ND	NR	NR
MW-2	09-09-92	334.80	9.92	324.88	ND	NR	NR
MW-2	10-26-92	334.80	10.13	324.67	ND	NR	NR
MW-2	11-10-92	334.80	10.12	324.68	ND	NR	NR
MW-2	12-14-92	334.80	8.99	325.81	ND	NR	NR
MW-2	01-15-93	334.80	7.20	327.60	ND	NR	NR
MW-2	02-10-93	334.80	7.30	327.50	ND	NR	NR
MW-2	03-29-93	334.80	6.60	328.20	ND	NR	NR
MW-2	04-27-93	334.80	7.10	327.70	ND	NR	NR
MW-2	05-10-93	334.80	7.40	327.40	ND	NR	NR
MW-2	06-18-93	334.80	8.02	326.78	ND	NR	NR
MW-2	07-28-93	334.80	8.47	326.33	ND	NR	NR
MW-2	08-30-93	334.80	8.80	326.00	ND	NR	NR
MW-2	09-28-93	334.80	9.19	325.61	ND	NR	NR
MW-2	10-31-93	334.80	9.12	325.68	ND	NR	NR
MW-2	11-11-93	334.80	9.02	325.78	ND	NR	NR
MW-2	12-15-93	334.80	8.82	325.98	ND	NR	NR
MW-2	02-11-94	334.80	8.59	326.21	ND	NR	NR
MW-2	03-13-94	334.80	8.09	326.71	ND	NR	NR
MW-2	05-17-94	334.80	7.99	326.81	ND	NR	NR
MW-2	08-25-94	334.80	9.23	325.57	ND	NR	NR
MW-2	09-22-94	334.80	9.47	325.33	ND	NR	NR

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Date: 12-06-94
Project Number: 0805-132.01

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-3	09-20-91	335.53	10.16	325.37	ND	NR	NR
MW-3	10-22-91	335.53	10.48	325.05	ND	NR	NR
MW-3	11-27-91	335.53	10.17	325.36	ND	NR	NR
MW-3	12-16-91	335.53	10.25	325.28	ND	NR	NR
MW-3	01-18-92	335.53	10.71	324.82	ND	NR	NR
MW-3	02-21-92	335.53	8.68	326.85	ND	NR	NR
MW-3	03-16-92	335.53	8.91	326.62	ND	NR	NR
MW-3	04-24-92	335.53	9.14	326.39	ND	NR	NR
MW-3	05-15-92	335.53	9.54	325.99	ND	NR	NR
MW-3	06-09-92	335.53	9.72	325.81	ND	NR	NR
MW-3	07-28-92	335.53	10.15	325.38	ND	NR	NR
MW-3	08-24-92	335.53	10.42	325.11	ND	NR	NR
MW-3	09-09-92	335.53	10.53	325.00	ND	NR	NR
MW-3	10-26-92	335.53	10.92	324.61	ND	NR	NR
MW-3	11-10-92	335.53	10.72	324.81	ND	NR	NR
MW-3	12-14-92	335.53	9.78	325.75	ND	NR	NR
MW-3	01-15-93	335.53	7.66	327.87	ND	NR	NR
MW-3	02-10-93	335.53	7.87	327.66	ND	NR	NR
MW-3	03-29-93	335.53	7.35	328.18	ND	NR	NR
MW-3	04-27-93	335.53	7.70	327.83	ND	NR	NR
MW-3	05-10-93	335.53	8.46	327.07	ND	NR	NR
MW-3	06-18-93	335.53	9.13	326.40	ND	NR	NR
MW-3	07-28-93	335.53	9.49	326.04	ND	NR	NR
MW-3	08-30-93	335.53	9.62	325.91	ND	NR	NR
MW-3	09-28-93	335.53	9.80	325.73	ND	NR	NR
MW-3	10-31-93	335.53	9.84	325.69	ND	NR	NR
MW-3	11-11-93	335.53	9.81	325.72	ND	NR	NR
MW-3	12-15-93	335.53	10.23	325.30	ND	NR	NR
MW-3	02-11-94	335.53	9.60	325.93	ND	NR	NR
MW-3	03-13-94	335.53	9.03	326.50	ND	NR	NR
MW-3	05-17-94	335.53	9.11	326.42	ND	NR	NR
MW-3	08-25-94	335.53	11.09	324.44	ND	NR	NR
MW-3	09-22-94	335.53	10.21	325.32	ND	NR	NR

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Date: 12-06-94
Project Number: 0805-132.01

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-4	11-10-92	334.22	9.58	324.64	ND	NR	NR
MW-4	12-14-92	334.22	8.72	325.50	ND	NR	NR
MW-4	01-15-93	334.22	7.27	326.95	ND	NR	NR
MW-4	02-10-93	334.22	6.80	327.42	ND	NR	NR
MW-4	03-29-93	334.22	6.29	327.93	ND	NR	NR
MW-4	04-27-93	334.22	6.33	327.89	ND	NR	NR
MW-4	05-10-93	334.22	6.68	327.54	ND	NR	NR
MW-4	06-18-93	334.22	7.05	327.17	ND	NR	NR
MW-4	07-28-93	334.22	7.77	326.45	ND	NR	NR
MW-4	08-30-93	334.22	8.09	326.13	ND	NR	NR
MW-4	09-28-93	334.22	8.40	325.82	ND	NR	NR
MW-4	10-31-93	334.22	8.56	325.66	ND	NR	NR
MW-4	11-11-93	334.22	8.48	325.74	ND	NR	NR
MW-4	12-15-93	334.22	8.38	325.84	ND	NR	NR
MW-4	02-11-94	334.22	8.15	326.07	ND	NR	NR
MW-4	03-13-94	334.22	7.57	326.65	ND	NR	NR
MW-4	05-17-94	334.22	7.49	326.73	ND	NR	NR
MW-4	08-25-94	334.22	8.79	325.43	ND	NR	NR
MW-4	09-22-94	334.22	8.99	325.23	ND	NR	NR
MW-5	11-10-92	335.87	11.02	324.85	ND	NR	NR
MW-5	12-14-92	335.87	10.17	325.70	ND	NR	NR
MW-5	01-15-93	335.87	8.14	327.73	ND	NR	NR
MW-5	02-10-93	335.87	8.00	327.87	ND	NR	NR
MW-5	03-29-93	335.87	7.52	328.35	ND	NR	NR
MW-5	04-27-93	335.87	8.26	327.61	ND	NR	NR
MW-5	05-10-93	335.87	8.64	327.23	ND	NR	NR
MW-5	06-18-93	335.87	9.26	326.61	ND	NR	NR
MW-5	07-28-93	335.87	9.65	326.22	ND	NR	NR
MW-5	08-30-93	335.87	9.81	326.06	ND	NR	NR
MW-5	09-28-93	335.87	9.99	325.88	ND	NR	NR
MW-5	10-31-93	335.87	10.02	325.85	ND	NR	NR
MW-5	11-11-93	335.87	10.09	325.78	ND	NR	NR
MW-5	12-15-93	335.87	10.08	325.79	ND	NR	NR
MW-5	02-11-94	335.87	9.63	326.24	ND	NR	NR
MW-5	03-13-94	335.87	9.26	326.61	ND	NR	NR
MW-5	05-17-94	335.87	8.99	326.88	ND	NR	NR
MW-5	08-25-94	335.87	10.23	325.64	ND	NR	NR
MW-5	09-22-94	335.87	10.39	325.48	ND	NR	NR

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Date: 12-06-94
Project Number: 0805-132.01

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-6	11-10-92	335.84	11.03	324.81	ND	NR	NR
MW-6	12-14-92	335.84	10.03	325.81	ND	NR	NR
MW-6	01-15-93	335.84	7.64	328.20	ND	NR	NR
MW-6	02-10-93	335.84	8.22	327.62	ND	NR	NR
MW-6	03-29-93	335.84	7.59	328.25	ND	NR	NR
MW-6	04-27-93	335.84	8.20	327.64	ND	NR	NR
MW-6	05-10-93	335.84	8.85	326.99	ND	NR	NR
MW-6	06-18-93	335.84	9.26	326.58	ND	NR	NR
MW-6	07-28-93	335.84	9.83	326.01	ND	NR	NR
MW-6	08-30-93	335.84	10.15	325.69	ND	NR	NR
MW-6	09-28-93	335.84	9.95	325.89	ND	NR	NR
MW-6	10-31-93	335.84	10.16	325.68	ND	NR	NR
MW-6	11-11-93	335.84	10.02	325.82	ND	NR	NR
MW-6	12-15-93	335.84	10.28	325.56	ND	NR	NR
MW-6	02-11-94	335.84	9.66	326.18	ND	NR	NR
MW-6	03-13-94	335.84	9.28	326.56	ND	NR	NR
MW-6	05-17-94	335.84	9.10	326.74	ND	NR	NR
MW-6	08-25-94	335.84	10.39	325.45	ND	NR	NR
MW-6	09-22-94	335.84	10.50	325.34	ND	NR	NR

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

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Date: 11-07-94
Project Number: 0805-132.01

Well Designation	Water Sample Field Date	TPHG ppb	Benzene ppb	Toluene ppb	Ethyl-benzene ppb	Total Xylenes ppb
MW-1	09-20-91	410	28	36	4.3	89
MW-1	12-16-91	840	50	50	3.9	12
MW-1	03-16-92	780	22	12	45	22
MW-1	06-09-92	700	8.8	15	16	18
MW-1	09-09-92	400	5.4	8.4	4.6	6.7
MW-1	11-10-92	2800	93	56	190	390
MW-1	02-10-93	9700	180	100	450	740
MW-1	05-10-93	6400	120	12	410	300
MW-1	08-30-93	2000	2.5	<2.5	110	61
MW-1	11-11-93	2100	<2.5	<2.5	66	20
MW-1	02-11-94	2000	<2.5	<2.5	25	5.7
MW-1	05-17-94	1400	79	1.4	11	2.4
MW-1	08-25-94	880	2.4	<1	4.6	<1
MW-2	09-20-91	130	6.6	0.96	1.4	1.5
MW-2	12-16-91	83	0.96	<0.3	<0.3	<0.3
MW-2	03-16-92	430	130	<2.5	37	5
MW-2	06-09-92	120	3.7	<0.5	5.7	<0.5
MW-2	09-09-92	<50	<0.5	<0.5	<0.5	<0.5
MW-2	11-10-92	<50	<0.5	<0.5	<0.5	<0.5
MW-2	02-10-93	740	110	<5	35	<5
MW-2	05-10-93	2000	650	14	86	28
MW-2	08-30-93	170	1.4	7.9	1.6	15
MW-2	11-11-93	78	<0.5	2.8	0.7	5.9
MW-2	02-11-94	<50	2.4	0.7	<0.5	<0.5
MW-2	05-17-94	150	19	<0.5	2.5	1.2
MW-2	08-25-94	<50	<0.5	<0.5	<0.5	<0.5

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Date: 11-07-94
Project Number: 0805-132.01

Well Designation	Water Sample Field Date	TPHG ppb	Benzene ppb	Toluene ppb	Ethyl-benzene ppb	Total Xylenes ppb
MW-3	09-20-91	990	50	100	11	200
MW-3	12-16-91	1000	180	5.1	23	4.3
MW-3	03-16-92	430	86	<1.0	22	3.4
MW-3	06-09-92	1800	290	2.4	49	17
MW-3	09-09-92	2600	550	<5	120	12
MW-3	11-10-92	1100	280	<5	100	<5
MW-3	02-10-93	980	190	<5	52	<5
MW-3	05-10-93	1100	280	<2.5	70	<2.5
MW-3	08-30-93	470	120	<1	22	<1
MW-3	11-11-93	830	96	<2.5	25	<2.5
MW-3	02-11-94	220	42	<1.0	84	<1.0
MW-3	05-17-94	200	44	<0.5	9.3	<0.5
MW-3	08-25-94	100	4.3	<0.5	1.1	<0.5
MW-4	11-10-92	<50	<0.5	<0.5	<0.5	<0.5
MW-4	02-10-93	<50	<0.5	<0.5	<0.5	<0.5
MW-4	05-10-93	<50	<0.5	<0.5	<0.5	<0.5
MW-4	08-30-93	<50	<0.5	<0.5	<0.5	<0.5
MW-4	11-11-93	<50	<0.5	<0.5	<0.5	<0.5
MW-4	02-11-94	<50	<0.5	<0.5	<0.5	<0.5
MW-4	05-17-94	<50	<0.5	<0.5	<0.5	<0.5
MW-4	08-25-94	<50	<0.5	<0.5	<0.5	<0.5
MW-5	11-10-92	<50	<0.5	<0.5	<0.5	<0.5
MW-5	02-10-93	<50	<0.5	<0.5	<0.5	<0.5
MW-5	05-10-93	<50	<0.5	<0.5	<0.5	<0.5
MW-5	08-30-93	<50	<0.5	<0.5	<0.5	<0.5
MW-5	11-11-93	<50	<0.5	<0.5	<0.5	<0.5
MW-5	02-11-94	<50	<0.5	<0.5	<0.5	<0.5
MW-5	05-17-94	<50	<0.5	<0.5	<0.5	<0.5
MW-5	08-25-94	<50	<0.5	<0.5	<0.5	<0.5

Table 3
Historical Groundwater Analytical Data
Summary Report

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Date: 11-07-94
Project Number: 0805-132.01

Well Designation	Water Sample Field Date	TPHG ppb	Benzene ppb	Toluene ppb	Ethyl-benzene ppb	Total Xylenes ppb
MW-6	11-10-92	<50	<0.5	<0.5	<0.5	<0.5
MW-6	02-10-93	<50	<0.5	<0.5	<0.5	<0.5
MW-6	05-10-93	<50	<0.5	<0.5	<0.5	<0.5
MW-6	08-30-93	<50	<0.5	<0.5	<0.5	<0.5
MW-6	11-11-93	<50	<0.5	<0.5	<0.5	<0.5
MW-6	02-11-94	<50	<0.5	<0.5	<0.5	<0.5
MW-6	05-17-94	<50	<0.5	<0.5	<0.5	<0.5
MW-6	08-25-94	<50	<0.5	<0.5	<0.5	<0.5

TPHG = Total petroleum hydrocarbons as gasoline
ppb = parts per billion or micrograms per liter (µg/l)

Table 4
Historical Groundwater Elevation Data
Summary Report

BP Station 1116, 7197 Village Parkway,
Former Shell Station, 7194 Amador Valley Blvd.,
and UNOCAL Station, 7375 Amador Valley Blvd.,
Dublin, California

Date: 12-21-94
Project Number: 0805-132.01

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
BP Station 1116					
MW-1	11-10-92	335.17	10.67	324.50	
MW-1	02-10-93	335.17	5.25	329.92	
MW-1	05-21-93	335.17	5.73	329.44	
MW-1	08-12-93	335.17	8.99	326.18	
MW-1	11-11-93	335.17	9.65	325.52	
MW-1	02-11-94	335.17	8.72	326.45	
MW-1	10-04-94	335.17	9.66	325.51	
MW-2	11-10-92	334.58	10.27	324.31	
MW-2	02-10-93	334.58	6.46	328.12	
MW-2	05-21-93	334.58	6.96	327.62	
MW-2	08-12-93	334.58	8.58	326.00	
MW-2	11-11-93	334.58	9.28	325.30	
MW-2	02-11-94	334.58	8.10	326.48	
MW-2	10-04-94	334.58	9.27	325.31	
MW-3	11-10-92	335.13	10.78	324.35	
MW-3	02-10-93	335.13	7.16	327.97	
MW-3	05-21-93	335.13	7.69	327.44	
MW-3	08-12-93	335.13	9.11	326.02	
MW-3	11-11-93	335.13	9.78	325.35	
MW-3	02-11-94	335.13	8.60	326.53	
MW-3	10-04-94	335.13	9.81	325.32	
AW-4	11-10-92	333.41	9.10	324.31	
AW-4	02-10-93	333.41			Not surveyed: well was inaccessible
AW-4	05-21-93	333.41			Not surveyed: well was inaccessible
AW-4	08-12-93	333.41			Not surveyed: well was inaccessible
AW-4	11-11-93	333.41	8.00	325.41	
AW-4	02-11-94	333.41	6.84	326.57	
AW-4	10-04-94	333.41	8.04	325.37	

Table 4
Historical Groundwater Elevation Data
Summary Report

BP Station 1116, 7197 Village Parkway,
Former Shell Station, 7194 Amador Valley Blvd.,
and UNOCAL Station, 7375 Amador Valley Blvd.,
Dublin, California

Date: 12-21-94
Project Number: 0805-132.01

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
AW-5	11-10-92	334.81	10.27	324.54	
AW-5	02-10-93	334.81	7.29	327.52	
AW-5	05-21-93	334.81	7.77	327.04	
AW-5	08-12-93	334.81	8.87	325.94	
AW-5	11-11-93	334.81	9.13	325.68	
AW-5	02-11-94	334.81	8.20	326.61	
AW-5	10-04-94	334.81	8.70	326.11	
AW-6	11-10-92	334.90	10.10	324.80	
AW-6	02-10-93	334.90	7.13	327.77	
AW-6	05-21-93	334.90	7.64	327.26	
AW-6	08-12-93	334.90	8.64	326.26	
AW-6	11-11-93	334.90	8.67	326.23	
AW-6	02-11-94	334.90	8.04	326.86	
AW-6	10-04-94	334.90	9.33	325.57	
Former Shell Station					
MW-1	11-10-92	334.83	10.04	324.79	
MW-1	02-10-93	334.83	7.24	327.59	
MW-1	05-10-93	334.83	7.78	327.05	
MW-1	08-12-93	334.83	8.54	326.29	
MW-1	11-11-93	334.83	8.56	326.27	
MW-1	02-11-94	334.83	8.62	326.21	
MW-1	08-25-94	334.83	9.24	325.59	
MW-2	11-10-92	336.96	12.05	324.91	
MW-2	02-10-93	336.96	9.28	327.68	
MW-2	05-10-93	336.96	9.65	327.31	
MW-2	08-12-93	336.96	10.70	326.26	
MW-2	11-11-93	336.96	11.36	325.60	
MW-2	02-11-94	336.96	11.04	325.92	
MW-2	08-25-94	336.96	11.29	325.67	

Table 4
Historical Groundwater Elevation Data
Summary Report

BP Station 1116, 7197 Village Parkway,
Former Shell Station, 7194 Amador Valley Blvd.,
and UNOCAL Station, 7375 Amador Valley Blvd.,
Dublin, California

Date: 12-21-94
Project Number: 0805-132.01

Well Desig-nation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
MW-3	11-10-92	336.93	11.84	325.09	
MW-3	02-10-93	336.93	8.82	328.11	
MW-3	05-10-93	336.93	10.88	326.05	
MW-3	08-12-93	336.93	10.36	326.57	
MW-3	11-11-93	336.93	10.64	326.29	
MW-3	02-11-94	336.93	10.68	326.25	
MW-3	08-25-94	336.93	11.30	325.63	
MW-4	11-10-92	337.14	12.12	325.02	
MW-4	02-10-93	337.14	9.40	327.74	
MW-4	05-10-93	337.14	9.54	327.60	
MW-4	08-12-93	337.14	10.68	326.46	
MW-4	11-11-93	337.14	11.97	325.17	
MW-4	02-11-94	337.14	10.71	326.43	
MW-4	08-25-94	337.14	10.84	326.30	
MW-5	11-10-92	334.96	9.65	325.31	
MW-5	02-10-93	334.96	7.97	326.99	
MW-5	05-10-93	334.96	Not surveyed:		
MW-5	08-12-93	334.96	8.75	326.21	
MW-5	11-11-93	334.96	9.32	325.64	
MW-5	02-11-94	334.96	8.97	325.99	
MW-5	08-25-94	334.96	9.19	325.77	
MW-6	11-10-92	335.42	10.56	324.86	
MW-6	02-10-93	335.42	7.65	327.77	
MW-6	05-10-93	335.42	8.10	327.32	
MW-6	08-12-93	335.42	9.18	326.24	
MW-6	11-11-93	335.42	9.38	326.04	
MW-6	02-11-94	335.42	9.02	326.40	
MW-6	08-25-94	335.42	9.79	325.63	

Table 4
Historical Groundwater Elevation Data
Summary Report

BP Station 1116, 7197 Village Parkway,
Former Shell Station, 7194 Amador Valley Blvd.,
and UNOCAL Station, 7375 Amador Valley Blvd.,
Dublin, California

Date: 12-21-94
Project Number: 0805-132.01

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
MW-7	11-10-92	333.23	8.82	324.41	
MW-7	02-10-93	333.23	6.06	327.17	
MW-7	05-10-93	333.23	6.68	326.55	
MW-7	08-12-93	333.23	6.83	326.40	
MW-7	11-11-93	333.23	6.90	326.33	
MW-7	02-11-94	333.23	6.12	327.11	
MW-7	08-25-94	333.23	6.76	326.47	
MW-8	11-10-92	335.80	10.41	325.39	
MW-8	02-10-93	335.80	7.35	328.45	
MW-8	05-10-93	335.80	8.00	327.80	
MW-8	08-12-93	335.80	9.00	326.80	
MW-8	11-11-93	335.80	9.47	326.33	
MW-8	02-11-94	335.80	8.80	327.00	
MW-8	08-25-94	335.80	9.52	326.28	
MW-9	11-10-92	334.57	9.61	324.96	
MW-9	02-10-93	334.57	7.20	327.37	
MW-9	05-10-93	334.57	7.56	327.01	
MW-9	08-12-93	334.57	8.25	326.32	
MW-9	11-11-93	334.57	10.30	324.27	
MW-9	02-11-94	334.57	8.88	325.69	
MW-9	08-25-94	334.57	8.79	325.78	
MW-11	11-10-92	334.20	9.47	324.73	
MW-11	02-10-93	334.20	6.79	327.41	
MW-11	05-10-93	334.20	7.18	327.02	
MW-11	08-12-93	334.20	8.10	326.10	
MW-11	11-11-93	334.20	8.56	325.64	
MW-11	02-11-94	334.20	8.21	325.99	
MW-11	08-25-94	334.20	8.68	325.52	

Table 4
Historical Groundwater Elevation Data
Summary Report

BP Station 1116, 7197 Village Parkway,
Former Shell Station, 7194 Amador Valley Blvd.,
and UNOCAL Station, 7375 Amador Valley Blvd.,
Dublin, California

Date: 12-21-94
Project Number: 0805-132.01

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
MW-12	11-10-92	332.53	8.32	324.21	
MW-12	02-10-93	332.53	6.75	325.78	
MW-12	05-10-93	332.53	Not surveyed:		
MW-12	08-12-93	332.53	6.23	326.30	
MW-12	11-11-93	332.53	7.43	325.10	
MW-12	02-11-94	332.53	7.18	325.35	
MW-12	08-25-94	332.53	7.24	325.29	
MW-13	11-10-92	335.64	10.69	324.95	
MW-13	02-10-93	335.64	7.49	328.15	
MW-13	05-10-93	335.64	8.06	327.58	
MW-13	08-12-93	335.64	8.73	326.91	
MW-13	11-11-93	335.64	9.15	326.49	
MW-13	02-11-94	335.64	9.12	326.52	
MW-13	08-25-94	335.64	9.32	326.32	
RW-1	08-25-94	336.19	10.56	325.63	
UNOCAL Station					
MW-1	11-10-92	336.72	11.97	324.75	
MW-1	02-10-93	336.72	8.63	328.09	
MW-1	05-10-93	336.72	9.57	327.15	
MW-1	08-12-93	336.08	9.91	326.17	
MW-1	11-11-93	336.08	10.17	325.90	Corrected elevation
MW-1	02-11-94	336.08	9.72	326.35	Corrected elevation
MW-1	05-17-94	336.08	9.26	326.81	Corrected elevation
MW-1	08-25-94	336.08	10.58	325.49	Corrected elevation

Table 4
Historical Groundwater Elevation Data
Summary Report

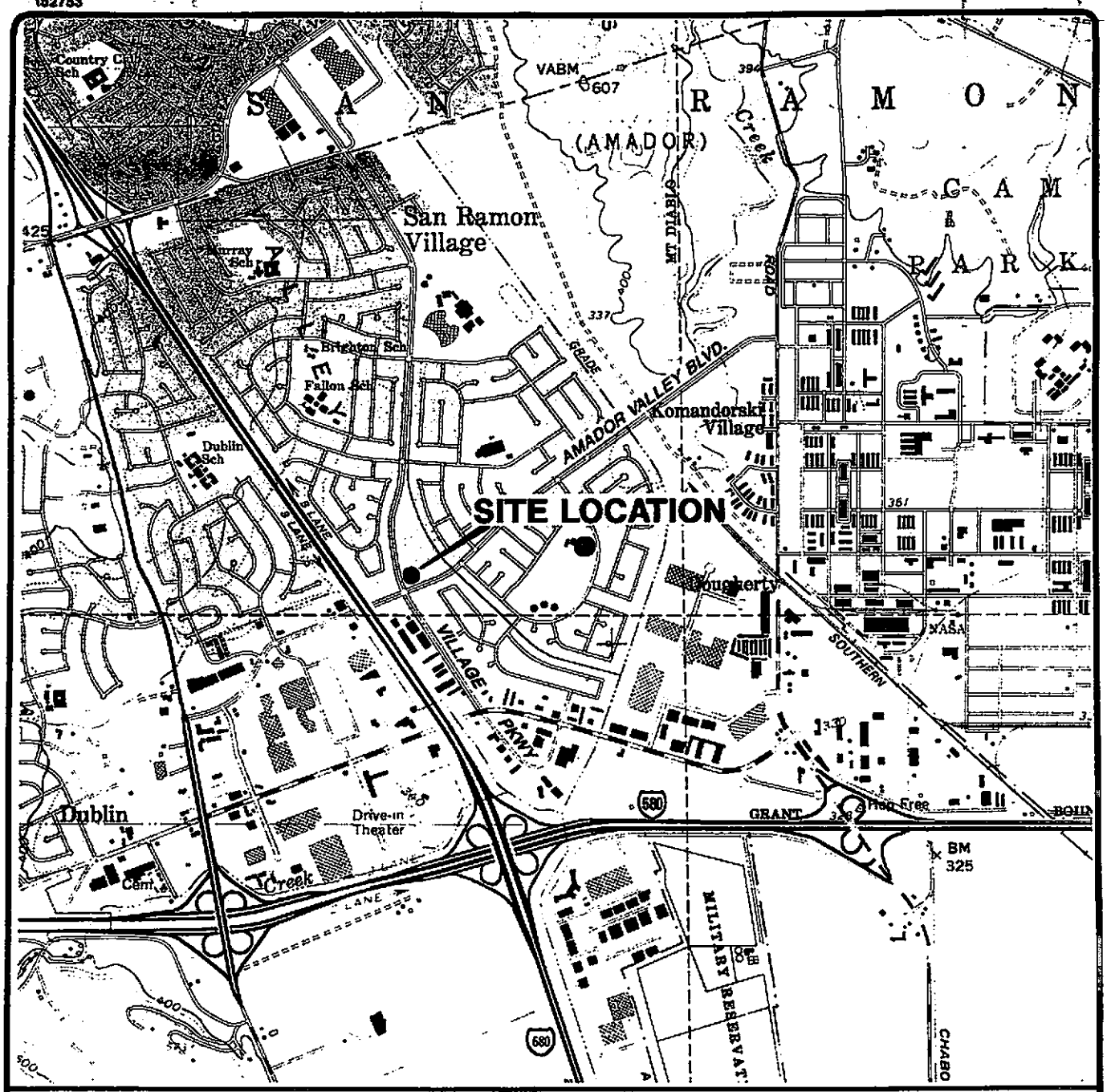
BP Station 1116, 7197 Village Parkway,
Former Shell Station, 7194 Amador Valley Blvd.,
and UNOCAL Station, 7375 Amador Valley Blvd.,
Dublin, California

Date: 12-21-94
Project Number: 0805-132.01

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Comments
MW-2	11-10-92	337.36	12.15	325.21	
MW-2	02-10-93	337.36	8.81	328.55	
MW-2	05-10-93	337.36	9.75	327.61	
MW-2	08-12-93	336.78	10.11	326.67	
MW-2	11-11-93	336.78	10.51	326.27	
MW-2	02-11-94	336.78	9.85	326.93	
MW-2	05-17-94	336.78	9.31	327.47	
MW-2	08-25-94	336.78	10.75	326.03	
MW-3	11-10-92	337.53	12.33	325.20	
MW-3	02-10-93	337.53	8.95	328.58	
MW-3	05-10-93	337.53	9.91	327.62	
MW-3	08-12-93	336.98	10.34	326.64	
MW-3	11-11-93	336.98	10.64	326.34	
MW-3	02-11-94	336.98	10.01	326.97	
MW-3	05-17-94	336.98	9.49	327.49	
MW-3	08-25-94	336.98	10.93	326.05	
MW-4	11-10-92	337.00	12.32	324.68	
MW-4	02-10-93	337.00	8.94	328.06	
MW-4	05-10-93	337.00	9.90	327.10	
MW-4	08-12-93	336.42	10.32	326.10	
MW-4	11-11-93	336.42	10.48	325.95	Corrected elevation
MW-4	02-11-94	336.42	10.10	326.33	Corrected elevation
MW-4	05-17-94	336.42	9.63	326.80	Corrected elevation
MW-4	08-25-94	336.42	10.94	325.49	Corrected elevation
MW-5	02-11-94	335.96	10.08	325.88	
MW-5	05-17-94	335.96	9.24	326.72	
MW-5	08-25-94	335.96	10.43	325.53	

TOC = Top of casing
ft-MSL = Elevation in feet, relative to mean sea level

152753



EMCON Associates

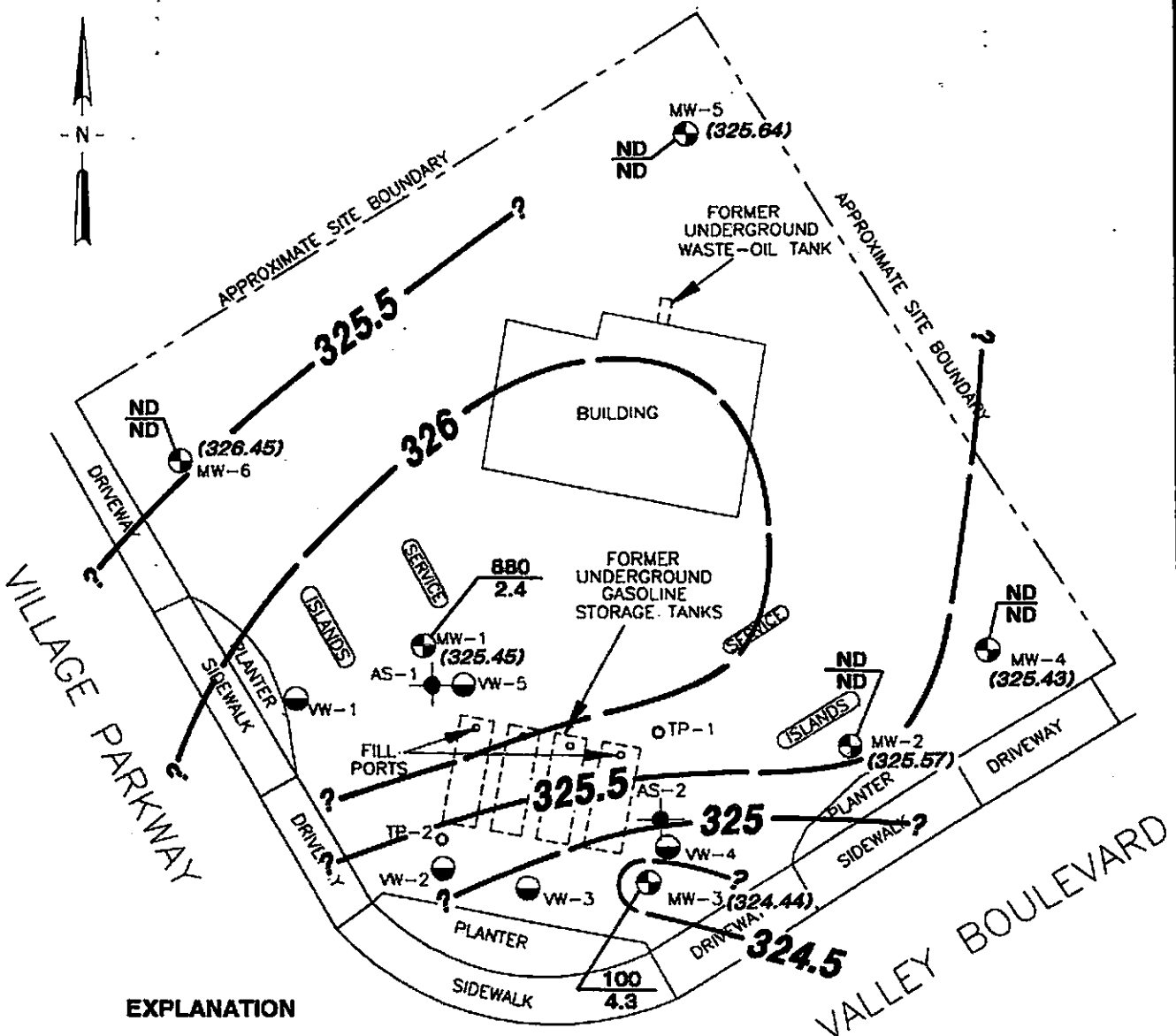
ARCO PRODUCTS COMPANY
SERVICE STATION 6041, 7249 VILLAGE PARKWAY
QUARTERLY GROUNDWATER MONITORING
DUBLIN, CALIFORNIA

SITE LOCATION

FIGURE 1

PROJECT NO. 805-132.01

195812



EXPLANATION

- Groundwater monitoring well
- Tank pit observation well
- Vapor extraction well
- Air sparge well
- (325.45) Groundwater elevation (Ft.-MSL); measured 8/25/94
- 100 / 4.3 — TPHG concentration in groundwater (ppb) / Benzene concentration in groundwater (ppb)
- ND = Not detected
- ? —— Groundwater elevation contour (Ft. -MSL)

SCALE: 0 40 FEET (Approximate)

Base map modified from RESNA, 1994.

12/94

EMCON Associates

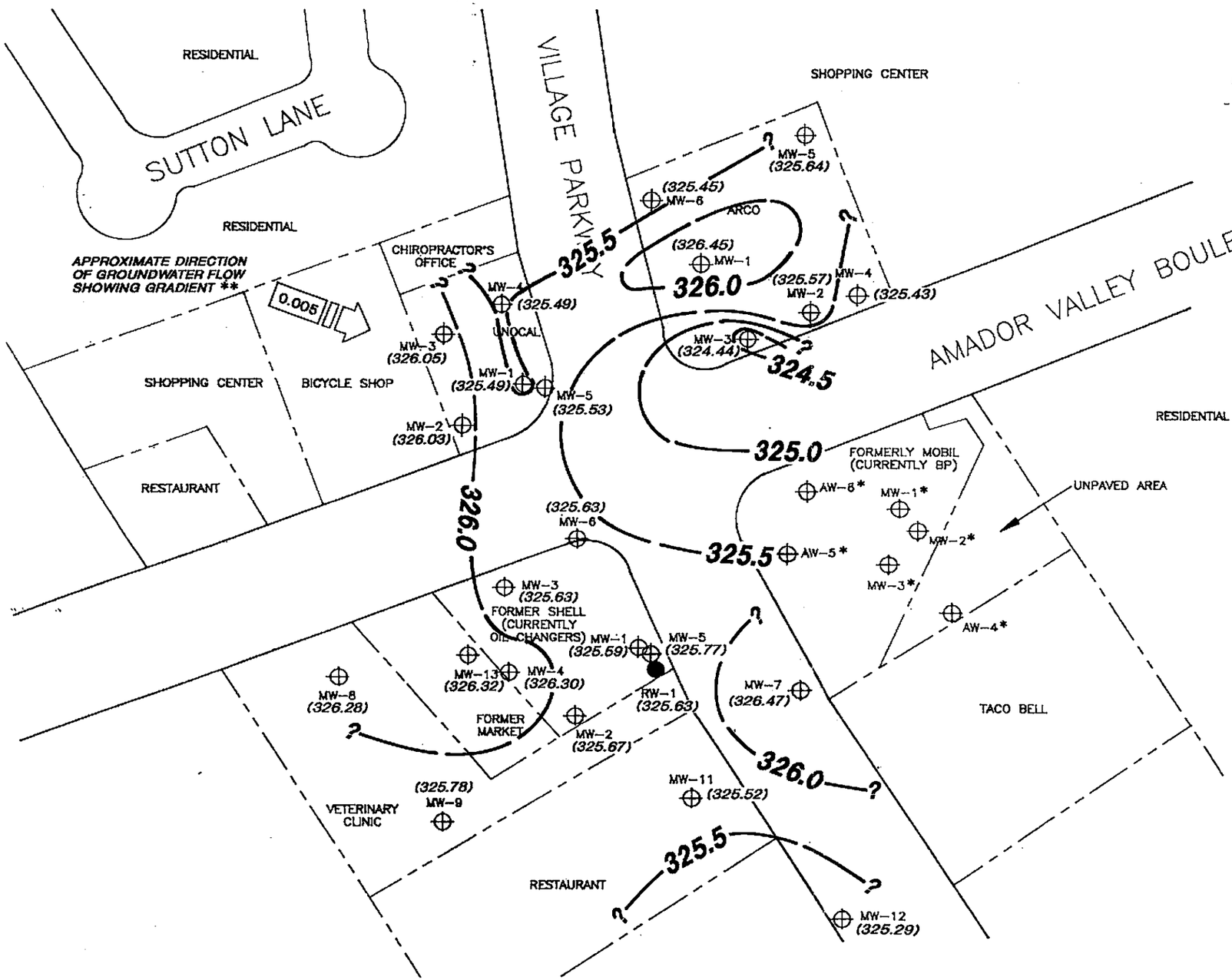
ARCO PRODUCTS COMPANY
SERVICE STATION 6041, 7249 VILLAGE PARKWAY
QUARTERLY GROUNDWATER MONITORING
DUBLIN, CALIFORNIA

GROUNDWATER DATA
THIRD QUARTER 1994

FIGURE 2

PROJECT NO. 805-132.01

155812



EXPLANATION

- ⊕ Groundwater monitoring well
- ● Recovery well
- (326.47) Groundwater elevation (Ft.-MSL); measured 8/25/94
- ? —— Groundwater elevation contour (Ft.-MSL)

** Approximate groundwater flow direction and gradient calculated using the following:
MW-5 (ARCO)
MW-3 (Unocal)
MW-12 (Shell)

* Wells at the BP service station (formerly Mobil) were not sampled during the cooperative sampling event.

Base map modified from RESNA, 1994.

12/94

EMCON Associates

Scale: 0 40 80 Feet

ARCO PRODUCTS COMPANY
SERVICE STATION 6041, 7249 VILLAGE PARKWAY
QUARTERLY GROUNDWATER MONITORING
DUBLIN, CALIFORNIA

VICINITY GROUNDWATER CONTOURS
THIRD QUARTER 1994

FIGURE 3

PROJECT NO. 805-132.01

APPENDIX A

FIELD DATA REPORT, INTEGRATED WASTESTREAM MANAGEMENT, SEPTEMBER 19, 1994

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

September 19, 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. 6041 in Dublin, California. Integrated Wastestream Management measured the depth to water and collected samples from wells at this site on August 25, 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

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

FIELD REPORT

Depth To Water / Floating Product Survey

Site Arrival Time: 1145
Site Departure Time: 1610
Weather Conditions: Sunny Clear

DTW: Well Box or Well Casing (circle one)

Project No.: _____ **Location:** 7249 Village Pky. **Date:** Aug 25, 1994

Client / Station#: Arco 6041 **Field Technician:** Vince/Cisco **Day of Week:** Thursday

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	OK	OK	17.84	10.11+	10.11+	N/A	N/A	N	4"	15/16
4	mw-2	OK	~~Yes~~	OK	OK	OK	14.24	9.23	9.23	N/A	N/A	N	4"	15/16
5	mw-3	OK	~~Yes~~	OK	OK	OK	15.02	11.09	11.09	N/A	N/A	N	4"	15/16
1	mw-4	OK	~~Yes~~	OK	OK	OK	14.90	8.79	8.79	N/A	N/A	N	4"	15/16
2	mw-5	OK	~~Yes~~	OK	OK	OK	17.90	10.23	10.23	N/A	N/A	N	4"	15/16
3	mw-6	OK	~~Yes~~	OK	OK	OK	16.13	10.39	10.39	N/A	N/A	N	4"	15/16

PAGE 2 OF 3 DATE: 8-25-94 CLIENT/STATION #: Arco 6041 ADDRESS: 7249 Village Pkwy

WELL ID: MW-2 TD 14.24 DTW 9.23 X 0.66 (Gal. / Linear Ft.) X 3 (Casing Volume) = 9.91 (Calculated Purge)

DATE PURGED: 8-25-94 START (2400 HR): 1515 END (2400 HR) 1516
DATE SAMPLED: 8-25-94 TIME (2400 HR): 1519 DTW: 9.8

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1515	1	7.15	1.90	73.2	CLOUDY
1516	4	7.13	2.22	72.8	CLEAR

Total purge: 4
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: WELL PUMPED DRY AT 4 GALLONS

WELL ID: MW-3 TD 15.02 DTW 11.09 X 0.66 (Gal. / Linear Ft.) X 3 (Casing Volume) = 7.78 (Calculated Purge)

DATE PURGED: 8-25-94 START (2400 HR): 1533 END (2400 HR) 1535
DATE SAMPLED: 8-25-94 TIME (2400 HR): 1540 DTW: 13.5

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1533	1	6.90	1.82	73.8	CLEAR
1534	4	6.88	1.74	73.1	CLEAR
1535	5	6.89	1.73	72.9	CLEAR

Total purge: 5
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: WELL PUMPED DRY AT 5 GALLONS.

WELL ID: MW-1 TD 17.84 DTW 10.11 X 0.66 (Gal. / Linear Ft.) X 3 (Casing Volume) = 1530 (Calculated Purge)

DATE PURGED: 8-25-94 START (2400 HR): 1545 END (2400 HR) 1548
DATE SAMPLED: 8-25-94 TIME (2400 HR): 1550 DTW: 14.3

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1546	2	6.90	1.73	73.7	CLEAR
1548	7	6.91	1.96	73.0	CLEAR

Total purge: 7
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: WELL PUMPED DRY AT 7 GALLONS.

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: Francisco Aranjan SIGNATURE: Francisco Aranjan

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: 8-25-94 CLIENT/STATION #: arco 6041 ADDRESS: 7249 Village Pkwy.

WELL ID: MW-4 TD 14.90 DTW 3.79 x 0.66 (Gal. / Linear Ft.) x 3 (Casing / Volume) = 12.09 (Calculated / Purge)

DATE PURGED: 8-25-94 START (2400 HR): 1450 END (2400 HR) 1455
DATE SAMPLED: 8-25-94 TIME (2400 HR): 1500 DTW: 12.1

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1452	2	7.17	1.30	71.8	clear
1453	8	7.19	1.27	70.5	clear
1455	12	7.18	1.26	70.1	clear

Total purge: 12
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: well pumped dry at 12 gallons.

WELL ID: MW-5 TD 17.90 DTW 10.23 x 0.66 (Gal. / Linear Ft.) x 3 (Casing / Volume) = 15.18 (Calculated / Purge)

DATE PURGED: 8-25-94 START (2400 HR): 1508 END (2400 HR) 1513
DATE SAMPLED: 8-25-94 TIME (2400 HR): 1516 DTW: 15.8

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1510	2	7.04	1.56	71.0	clear
1511	5	7.08	1.51	70.5	clear
1513	7	7.07	1.50	70.3	clear

Total purge: 7
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: well pumped dry at 7 gallons.

WELL ID: MW-6 TD 16.13 DTW 10.39 x 0.66 (Gal. / Linear Ft.) x 3 (Casing / Volume) = 11.36 (Calculated / Purge)

DATE PURGED: 8-25-94 START (2400 HR): 1520 END (2400 HR) 1525
DATE SAMPLED: 8-25-94 TIME (2400 HR): 1528 DTW: 13.9

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1522	2	6.93	1.64	70.8	clear
1523	6	6.89	1.62	70.0	clear
1525	7	6.88	1.61	69.8	clear

Total purge: 7
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Well pumped dry at 6 and again at 7 gallons.

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 Valdez SIGNATURE: Vince Valdez

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:

I NTEGRATED
W ASTESTREAM
M ANAGEMENT, INC.

October 3, 1994

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

Dear Mr. Young:

Enclosed are the monthly depth to water field reports for ARCO station 2185 located at 9800 E. 14th Avenue, Oakland, California and station 6041 located at 7249 Village Parkway, Dublin, California.

Please contact me at (408) 942-8955 with any questions.

Sincerely,

Gina Austin

Q3_9DTW.DOC

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

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

A6041Q3.XLS

Summary of Ground Water Sample Analyses for ARCO Facility A-6041, Dublin, California

WELL NUMBER	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6
DATE SAMPLED	8/25/94	8/25/94	8/25/94	8/25/94	8/25/94	8/25/94
DEPTH TO WATER	10.11	9.23	11.09	8.79	10.23	10.39
SHEEN	NONE	NONE	NONE	NONE	NONE	NONE
PRODUCT THICKNESS	NA	NA	NA	NA	NA	NA
TPHg	880	ND	100	ND	ND	ND
BTEX						
BENZENE	2.4	ND	4.3	ND	ND	ND
TOLUENE	< 1#	ND	ND	ND	ND	ND
ETHLYBENZENE	4.6	ND	1.1	ND	ND	ND
XYLENES	< 1#	ND	ND	ND	ND	ND

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: 1730
Site Departure Time: 1830
Weather Conditions: Sunny Clear

DTW: Well Box or Well Casing (circle one)

Project No.: _____ **Location:** Amador Valley Dublin **Date:** 9-22-94

Client / Station#: Arco 6041 **Field Technician:** Vinu / Cisco **Day of Week:** Thursday

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)	COMMENTS	MATERIALS
6	MW-1	OK	Yes	OK	OK	OK	N/A	11.20+	11.20+	N/A	N/A	N		
4	MW-2	OK	Yes	OK	OK	OK		9.47	9.47	N/A	N/A	N		
5	MW-3	OK	Yes	OK	OK	OK		10.21	10.21	N/A	N/A	N		
1	MW-4	OK	Yes	OK	OK	OK		8.99	8.99	N/A	N/A	N		
2	MW-5	OK	Yes	OK	OK	OK		10.39	10.39	N/A	N/A	N		
3	MW-6	OK	Yes	OK	OK	OK	6	10.50	10.50	N/A	N/A	N		

DUBLIN – 7375 Amador Valley Rd.

Post-It® Fax Note 7671	Date	# of pages ▶ 1
To ROB DAVIS	From S. KARKARIAN	
Co./Dept.	Co. M.P.D.S	
Phone #	Phone #	
Fax # 408.437.9526	Fax # (510) 689-1918	

TABLE

SUMMARY OF MON...
UNOCAL MONITORING WELLS

Well #	Ground Water Elevation (feet)	Depth to Water (feet)♦	Total Well Depth (feet)	Product Thickness (feet)	Sheen	Water Purged (gallons)
(Monitored and Sampled August 25, 1994)						
MW1	325.49	10.58	19.49	0	No	6.5
MW2*	326.03	10.75	19.27	0	--	0
MW3*	326.05	10.93	18.94	0	--	0
MW4*	325.49	10.94	19.43	0	--	0
MW5	325.53	10.43	20.00	0	No	7
(Monitored and Sampled on May 17, 1994)						
MW1	326.81	9.26	19.50	0	No	8
MW2*	327.47	9.31	19.26	0	--	0
MW3*	327.49	9.49	18.94	0	--	0
MW4*	326.80	9.63	19.44	0	--	0
MW5	326.72	9.24	20.00	0	No	8
(Monitored and Sampled on February 11, 1994)						
MW1	326.35	9.72	19.46	0	No	7
MW2	326.93	9.85	19.23	0	No	6.5
MW3	326.97	10.01	18.90	0	No	6.5
MW4	326.33	10.10	19.40	0	No	6.5
MW5	325.88	10.08	19.96	0	No	7
(Monitored and Sampled on November 11, 1993)						
MW1	325.90	10.17		0	No	7
MW2*	326.27	10.51		0	--	0
MW3*	326.34	10.64		0	--	0
MW4*	325.95	10.48		0	--	0

~~Shell~~ ~~BP~~

Shell

Avg. 2.5 DTW

Well No.	Well Elev.		GW elev
MW-1	334.83	9.24.	325.59
MW-2	336.96	11.29	325.67
MW-3	336.96	11.30	325.63
MW-4	337.14	10.84	326.30
MW-5	334.96	9.19	325.77
MW-6	335.42	9.79	325.63
MW-7	333.23	6.76	326.47
MW-8	335.80	9.52	326.28
MW-9	334.57	8.79	325.78
MW-10	~~335.57~~ Destroyed	—	
MW-11	334.20	8.68	325.52
MW-12	332.53	7.24	325.29
MW-13	335.64	9.32	326.32
RW-1	336.19	10.56	325.63

BP

MW-1	326.18	checking	NA.
MW-2	326.00		
MW-3	326.02		
AW-4	NA.		
AW-5	325.94		
AW-6	326.26		

PACIFIC ENVIRONMENTAL GROUP, INC.	Project No:	Figure No:	Date:
			Drawn By:
Title:			

ALISTO ENGINEERING GROUP
GROUNDWATER MONITORING

Client: BP Oil
Alisto Project No: 10-017-03-02
Service Station No: 1116

Date: 10-4-94
Field Personnel: Dave Crosby
Site Address: 7197 Village Pkwy

FIELD ACTIVITY:

___Groundwater Monitoring
___Groundwater Sampling
___Well Development

QUALITY CONTROL SAMPLES:

___ QC-1 Sample Duplicate (Well ID)
___ QC-2 Trip Blank
___ QC-3 Rinsate Blank

Well ID	Well Diam	Order Measured/ Sampled	Total Depth	Depth to Water	Depth to Product	Product Thick-ness	Comments
AW4	4		32.24	8.04			
MW3	2		25.44	9.81			
MW2	2		25.70	9.27			
MW1	2		25.96	9.66			
AW5	4		32.92	8.70			
AW6	4		16.51	9.33			

Notes:

FORM: FS2/121592

APPENDIX B

CERTIFIED ANALYTICAL REPORT AND CHAIN-OF-CUSTODY DOCUMENTATION, THIRD QUARTER 1994

Columbia Analytical Services, Inc.

September 12, 1994 Service Request No. S940965

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

Re: **ARCO Facility No. 6041**

Dear Ms. Austin/Mr. DeLon:

Attached are the results of the water samples submitted to our lab on August 26, 1994. For your reference, these analyses have been assigned our service request number S940965.

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
Laboratory Manager

Annelise J. Bazar
Regional QA Coordinator

KAM/ajb

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

COLUMBIA ANALYTICAL SERVICES, Inc.

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:**	S940965
Project:	ARCO Facility No. 6041	**Date Collected:**	8/25/94
Sample Matrix:	Water	**Date Received:**	8/26/94
		Date Extracted:	NA
		Date Analyzed:	9/1/94

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 (14.3) S940965-002	880	2.4	<1 *	4.6	<1 *
MW-2 (9.8) S940965-003	ND	ND	ND	ND	ND
MW-3 (13.5) S940965-004	100	4.3	ND	1.1	ND
MW-4 (12.1) S940965-005	ND	ND	ND	ND	ND
MW-5 (15.8) S940965-006	ND	ND	ND	ND	ND
MW-6 (13.9) S940965-007	ND	ND	ND	ND	ND
Method Blank S940901-WB	ND	ND	ND	ND	ND

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

Approved By: Karen A Murphy Date: September 12, 1994

5ABTXGAS/061694

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 6041
Sample Matrix: Water

Service Request: S940965
Date Collected: 8/25/94
Date Received: 8/26/94
Date Extracted: NA
Date Analyzed: 9/1/94

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 (14.3)	S940965-002	105 *
MW-2 (9.8)	S940965-003	100
MW-3 (13.5)	S940965-004	102
MW-4 (12.1)	S940965-005	95
MW-5 (15.8)	S940965-006	100
MW-6 (13.9)	S940965-007	97
MW-4 (12.1) MS	S940965-005MS	108
MW-4 (12.1) DMS	S940965-005DMS	109
Method Blank	S940901-WB	95

CAS Acceptance Limits: 69-116

* The surrogate used for this sample was 4-Bromofluorobenzene.

Approved By: Kevin A Murphy Date: September 15, 1994

SUR1/062994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 6041

Service Request: S940965
Date Analyzed: 9/1/94

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	26.3	105	85-115
Toluene	25	25.6	102	85-115
Ethylbenzene	25	26.0	104	85-115
Xylenes, Total	75	76.0	101	85-115
Gasoline	250	254	102	90-110

Approved By: Kevin A Murphy Date: September 12, 1994

ICV25AL/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 6041
Sample Matrix: Water

Service Request: S940965
Date Collected: 8/25/94
Date Received: 8/26/94
Date Extracted: NA
Date Analyzed: 9/1/94

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

Sample Name: MW-4 (12.1)
Lab Code: S940965-005

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	250	250	ND	244	241	98	96	67-121	1

Approved By: Karen A Murphy Date: September 13, 1994

DMS1S/060194

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

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. IWM-94-5CC

Chain of Custody

ARCO Facility no.	6041
City (Facility)	Dublin
Project manager (Consultant)	Tom DeLon - J Young
Laboratory name	Columbia
ARCO engineer	K.C.
Telephone no. (ARCO)	
Telephone no. (Consultant)	408/942 8955
Fax no. (Consultant)	408/942 1499
Contract number	07077
Consultant name	IWM / EMCON
Address (Consultant)	1921 Ringwood S.J
Method of shipment	sampler deliver

	Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid (Hcl)	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 ☐		
	FB-1	1	2		✓		✓	✓	8-25-94	1300		✓	✓										
4.3	MW-1	2	2		✓		✓	✓	〃	1550		✓	✓										
1.8	MW-2	3	2		✓		✓	✓	〃	1519		✓	✓										
3.5	MW-3	4	2		✓		✓	✓	〃	1540		✓	✓										
2.1	MW-4	5	2		✓		✓	✓	〃	1500		✓	✓										
5.8	MW 5	6	2		✓		✓	✓	〃	1516		✓	✓										
3.1	MW-6	7	2		✓		✓	✓	〃	1528		✓	✓										

Special detection Limit/reporting

Special QA/QC

Remarks: Hold On FB-1

Lab number: S940965

Turnaround time

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

Condition of sample: Okay

Temperature received: Cool

Relinquished by sampler	Date	Time	Received by	Date	Time
[signature] Valdez	8/26/94	445 pm	John Fuang CAS/SS	8/26/94	445 pm

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)