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

95 MAR 29 PM 12:45

Date March 20, 1995
Project 0805-132.01

To:

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

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We are enclosing:

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

For your:		Sent by:	
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	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

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: March 20, 1995

Re: ARCO Station # 6041 • 7249 Village Parkway • Dublin, 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

Michael R. Whelan
Environmental Engineer (415) 571-2449

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

March 17, 1995
Project 0805-132.01

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 6041, Dublin, California

Dear Mr. Whelan:

This letter presents the results of the fourth 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 installing three groundwater monitoring wells (MW-1, MW-2, and MW-3) beneath the tank pit to assess the presence of hydrocarbons.

Between October and November 1992, RESNA conducted a second phase of investigation. This investigation included installing three additional groundwater monitoring wells (MW-4, MW-5 and MW-6) and four vadose wells (VW-1 through VW-4) in October 1992, and conducting a soil-vapor extraction (SVE) pilot test in November 1992.

Between August 1993 and February 1994, RESNA conducted a third phase of investigation to further evaluate potential sources of gasoline hydrocarbons in soil, and to aid in the design of interim SVE and air-sparge (AS) systems. The work included installing one vadose well (VW-5) and two AS wells (AS-1 and AS-2), and conducting an AS pilot test.

Groundwater monitoring and sampling at this site was initiated in September 1991. There are currently six groundwater monitoring wells, five vadose wells, and two AS wells 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 fourth quarter 1994 groundwater monitoring event was performed by Integrated Wastestream Management (IWM) on November 18, 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 December 29, 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* (USEPA, 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 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. Table 4 summarizes historical groundwater elevation data for the British Petroleum (BP) station at 7197 Village Parkway, the former Shell station at 7194 Amador Valley Boulevard, and the UNOCAL station at 7375 Amador Valley Boulevard. Figure 3 illustrates vicinity groundwater elevation data for all four service stations (ARCO, BP, Shell, and UNOCAL) during the fourth quarter of 1994. Copies of

the fourth quarter 1994 analytical results and chain-of-custody documentation are included in Appendix B.

MONITORING PROGRAM EVALUATION

On-site groundwater contours and analytical data for the fourth 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 fourth quarter of 1994. An approximate groundwater flow direction and gradient for the site vicinity were calculated using groundwater elevation data collected from the UNOCAL, ARCO, and BP stations during the November 18, 1994, cooperative sampling event. Based on these data, groundwater in the site vicinity flows northeast at an approximate hydraulic gradient of 0.004 foot per foot (Figure 3).

Groundwater samples collected from wells MW-4, MW-5, and MW-6 did not contain detectable concentrations of TPHG or BTEX. Groundwater samples collected from wells MW-1, MW-2, and MW-3 contained 2,500, 237, and 1,850 parts per billion (ppb) TPHG, and 1.5, 1.9, and 3.5 ppb benzene, respectively. Similar analytical results were reported for all wells during previous monitoring events.

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/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 anticipated site activities for the first 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.

Work Anticipated for First Quarter 1995

- Prepare and submit quarterly groundwater monitoring report for fourth quarter 1994.
- Perform quarterly groundwater monitoring for first quarter 1995.

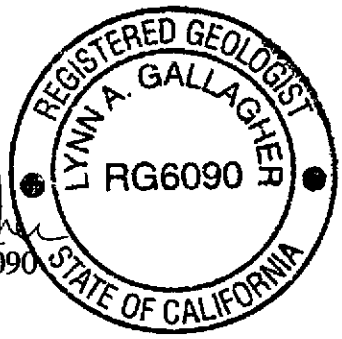
Please call if you have questions.

Sincerely,

EMCON

David Larsen
Project Coordinator

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



Attachments:
- Table 1 - Groundwater Monitoring Data, Fourth 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, Fourth Quarter 1994
- Figure 3 - Vicinity Groundwater contours (ARCO, BP, Shell, and UNOCAL Stations)
- Appendix A - Field Data Report, Integrated Wastestream Management, December 29, 1994
- Appendix B - Analytical Results and Chain-of-Custody Documentation, Fourth Quarter 1994

Table 1
Groundwater Monitoring Data
Fourth Quarter 1994
Summary Report

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Date: 02-08-95
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	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot		ppb	ppb	ppb	ppb	ppb
MW-1	11-18-94	336.56	10.25	326.31	ND	NR	NR	11-18-94	2500	1.5	<0.5	1.4	<1
MW-2	11-18-94	334.80	8.70	326.10	ND	NR	NR	11-18-94	237	1.9	0.6	<0.5	<1
MW-3	11-18-94	335.53	9.79	325.74	ND	NR	NR	11-18-94	1850	3.5	<0.5	0.9	<1
MW-4	11-18-94	334.22	8.31	325.91	ND	NR	NR	11-18-94	<50	<0.5	<0.5	<0.5	<1
MW-5	11-18-94	335.87	9.65	326.22	ND	NR	NR	11-18-94	<50	<0.5	<0.5	<0.5	<1
MW-6	11-18-94	335.84	9.54	326.30	ND	NR	NR	11-18-94	<50	<0.5	<0.5	<0.5	<1

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: 02-08-95
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
MW-1	11-18-94	336.56	10.25	326.31	ND	NR	NR

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Date: 02-08-95
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-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
MW-2	11-18-94	334.80	8.70	326.10	ND	NR	NR

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Date: 02-08-95
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-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
MW-3	11-18-94	335.53	9.79	325.74	ND	NR	NR

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Date: 02-08-95
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-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-4	11-18-94	334.22	8.31	325.91	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
MW-5	11-18-94	335.87	9.65	326.22	ND	NR	NR

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6041
7249 Village Parkway, Dublin, California

Date: 02-08-95
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
MW-6	11-18-94	335.84	9.54	326.30	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: 02-08-95
Project Number: 0805-132.01

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ppb	ppb	ppb	ppb	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: 02-08-95
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: 02-08-95
Project Number: 0805-132.01

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ppb	ppb	ppb	ppb	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: 02-08-95
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-1	11-18-94	335.17	Not surveyed:		
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-2	11-18-94	334.58	Not surveyed:		
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	
MW-3	11-18-94	335.13	Not surveyed:		
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	
AW-4	11-18-94	333.41	6.80	326.61	

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: 02-08-95
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-5	11-18-94	334.81	8.20	326.61	
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	
AW-6	11-18-94	334.90	7.17	327.73	
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-1	11-23-94	334.83	8.74	326.09	
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	
MW-2	11-23-94	336.96	10.92	326.04	

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: 02-08-95
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-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-3	11-23-94	336.93	10.48	326.45	
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-4	11-23-94	337.14	10.78	326.36	
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-5	11-23-94	334.96	8.78	326.18	
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	
MW-6	11-23-94	335.42	9.20	326.22	

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: 02-08-95
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-7	11-23-94	333.23	6.75	326.48	
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-8	11-23-94	335.80	9.08	326.72	
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-9	11-23-94	334.57	8.65	325.92	
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	
MW-11	11-23-94	334.20	8.27	325.93	

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: 02-08-95
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-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-12	11-23-94	332.53	7.16	325.37	
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	
MW-13	11-23-94	335.64	9.37	326.27	
RW-1	08-25-94	336.19	10.56	325.63	
RW-1	11-23-94	336.19	10.07	326.12	
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
MW-1	11-18-94	336.08	9.69	326.38	Corrected elevation

Table 4
Historical Groundwater Elevation Data
Summary Report

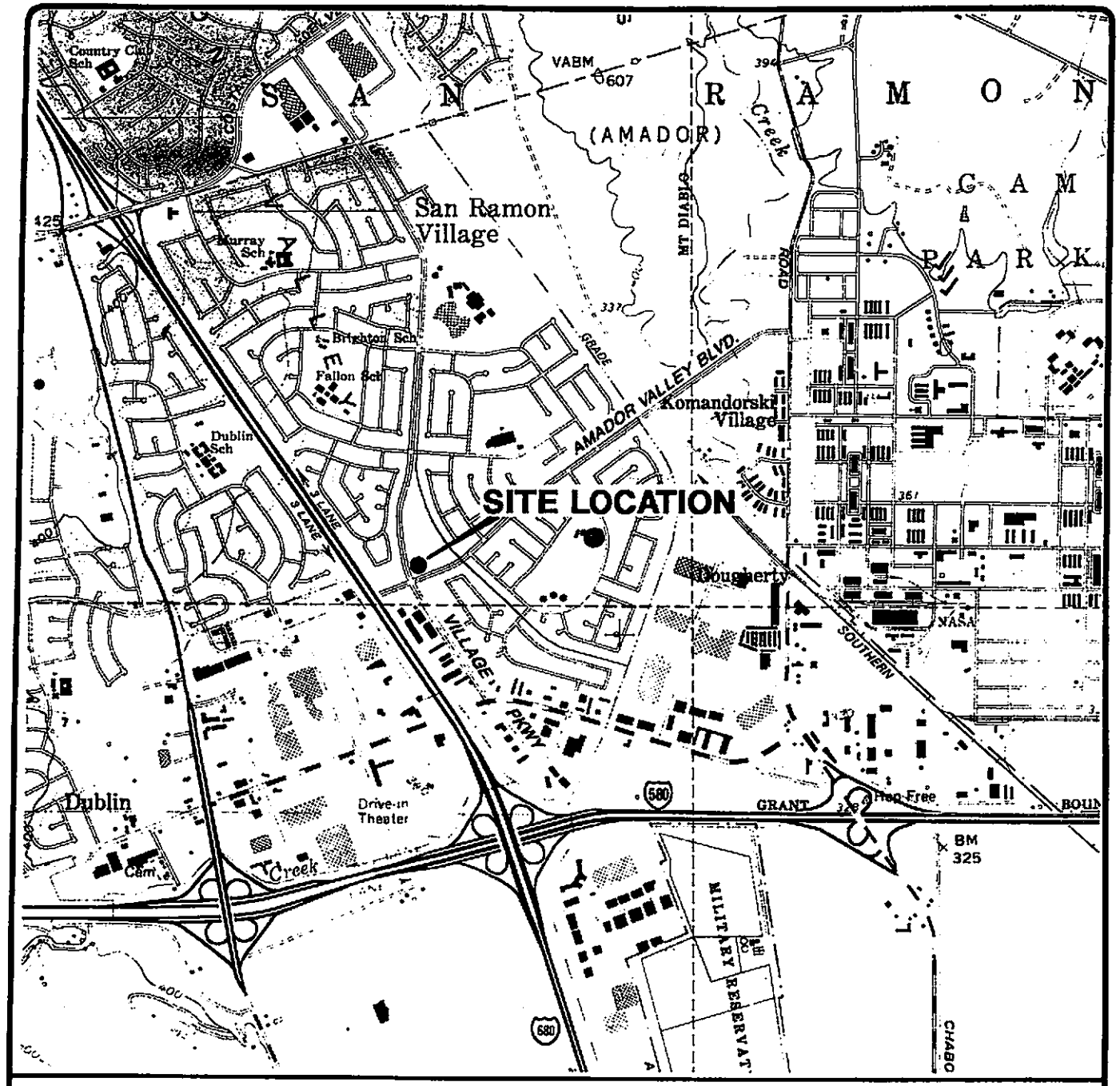
BP Station 1116, 7197 Village Parkway,
Former Shell Station, 7194 Amador Valley Blvd.,
and UNOCAL Station, 7375 Amador Valley Blvd.,
Dublin, California

Date: 02-08-95
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-2	11-18-94	336.78	9.95	326.83	
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-3	11-18-94	336.98	10.15	326.83	
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-4	11-18-94	336.42	10.10	326.33	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	
MW-5	11-18-94	335.96	10.09	325.87	

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

152783



Base map from USGS 7.5' Quad. Map:
Dublin, California. (Photorevised 1980).

Scale : 0 2000 4000 Feet

- N -

EMCON Associates

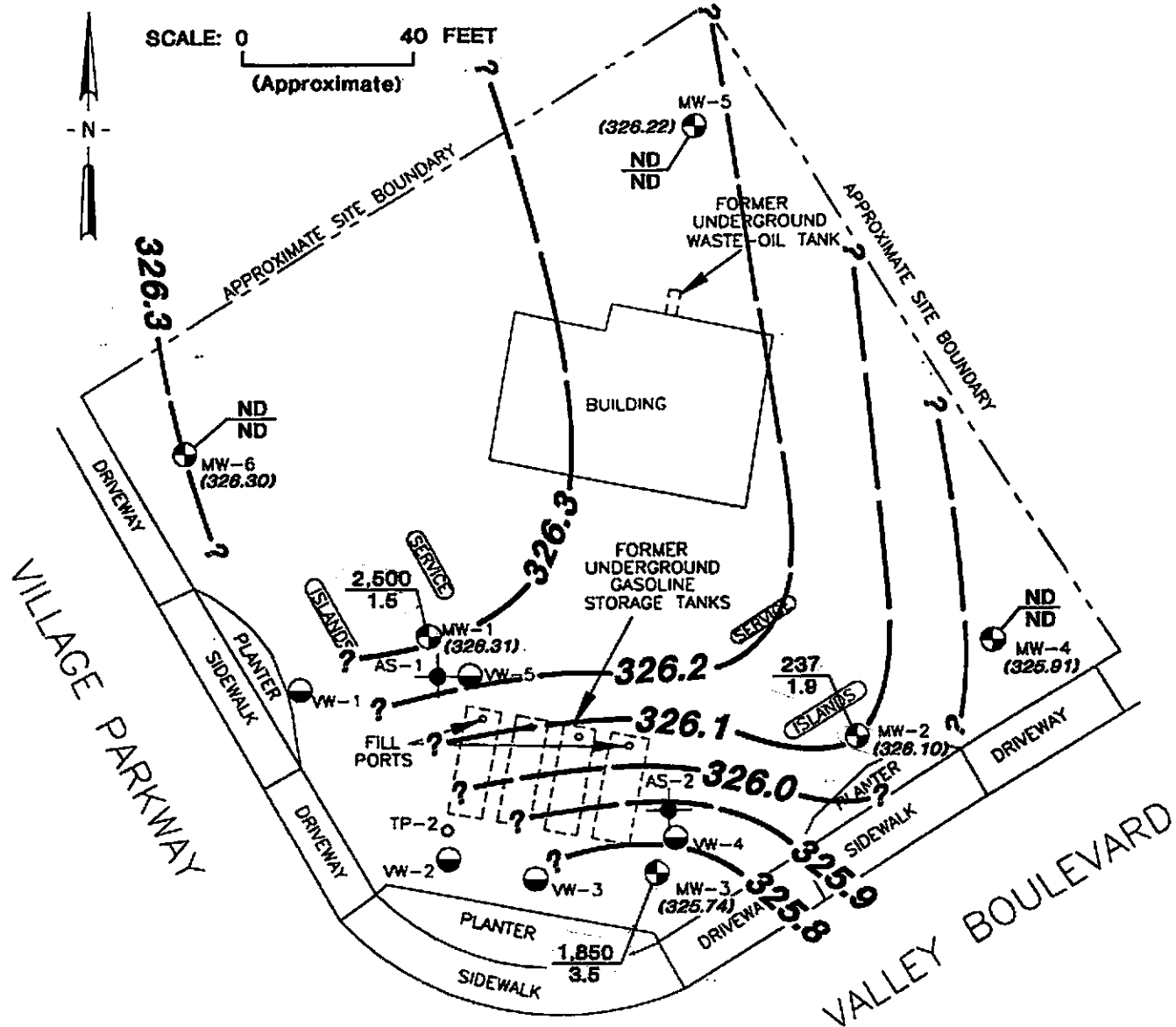
ARCO PRODUCTS COMPANY
SERVICE STATION 6041, 7249 VILLAGE PARKWAY
QUARTERLY GROUNDWATER MONITORING
DUBLIN, CALIFORNIA

SITE LOCATION

FIGURE 1

PROJECT NO. 805-132.01

155812



EXPLANATION

- Groundwater monitoring well
- Tank pit observation well
- Vapor extraction well
- Air sparge well
- (326.31) Groundwater elevation (Ft-.MSL); measured 11/18/94
- Groundwater elevation contour (Ft.-MSL)
- 237 / 1.9 — TPHG concentration in groundwater (ppb); sampled 11/18/94; Benzene concentration in groundwater (ppb); sampled 11/18/94
- ND — Not detected above method reporting limit for TPHG (50 ppb) and benzene (0.5 ppb)

Base map modified from RESNA, 1994.

9/86

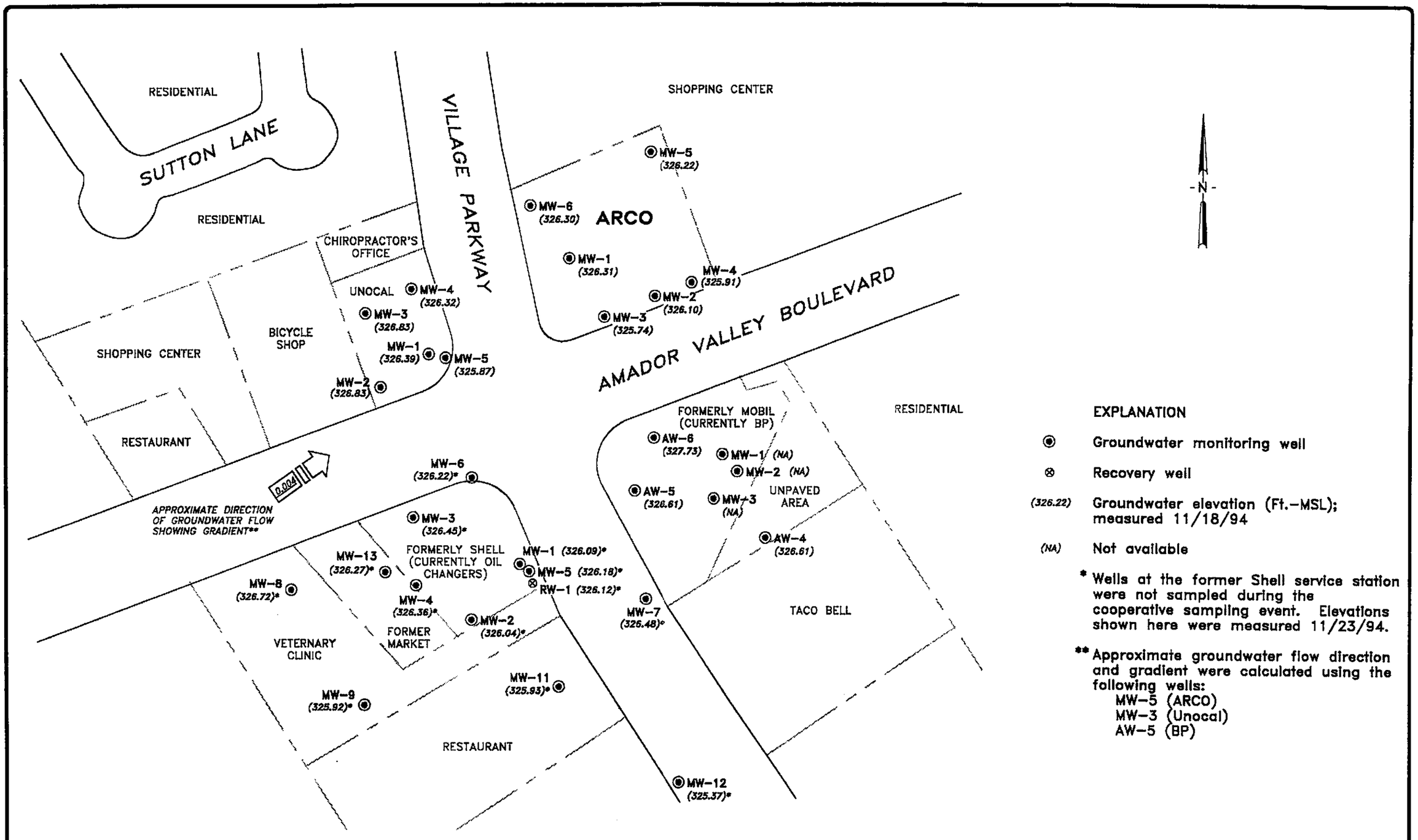
EMCON Associates

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

GROUNDWATER DATA
FOURTH QUARTER 1994

FIGURE 2

PROJECT NO. 805-132.01



EMCON

SCALE: 0 40 80 FEET

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

GROUNDWATER DATA
FOURTH QUARTER 1994

FIGURE
3
PROJECT NO.
805-132.01

APPENDIX A

FIELD REPORT, INTEGRATED WASTESTREAM MANAGEMENT, DECEMBER 29, 1994

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

December 29, 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 November 18, 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

EMCON ASSOCIATES

JAN 11 1995
RECEIVED

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

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

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

A6041Q4.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	11/18/94	11/18/94	11/18/94	11/18/94	11/18/94	11/18/94
DEPTH TO WATER	10.25	8.70	9.79	8.31	9.65	9.54
SHEEN	NONE	NONE	NONE	NONE	NONE	NONE
PRODUCT THICKNESS	NA	NA	NA	NA	NA	NA
TPHg	2,500	237#	1,850#	ND	ND	ND
BTEX						
BENZENE	1.5	1.9	3.5	ND	ND	ND
TOLUENE	ND	0.6	ND	ND	ND	ND
ETHLYBENZENE	1.4	ND	0.9	ND	ND	ND
XYLENES	ND	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: 1330
Site Departure Time: 1643
Weather Conditions: Sunny Clear

DTW: Well Box or Well Casing (circle one) — Well Casing circled

Project No.:
Location: 7249 Village Pkwy Dublin
Date: Nov. 18, 1994
Client / Station#: Arco 6041
Field Technician: Vince Valdes
Day of Week: Friday

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	10.25	10.25	N/A	N/A	N	4" H2O in Box	15/16
4	MW-2	OK	Yes	OK	OK	OK	14.24	8.70	8.70	N/A	N/A	N	4" Expanding cap cannot achieve good seal due to a broken casing lip	*15/16
5	MW-3	OK	Yes	OK	OK	OK	15.02	[illegible]	9.79+	N/A	N/A	N	4" 2nd DTW = 9.79+ H2O in Box	15/16
1	MW-4	OK	Yes	OK	OK	OK	14.90	8.31	8.31	N/A	N/A	N	4"	15/16
2	MW-5	OK	Yes	OK	OK	OK	17.90	9.65+	9.65+	N/A	N/A	N	4"	15/16
3	MW-6	OK	Yes	OK	OK	R	16.13	9.54-	9.54-	N/A	N/A	N	4" H2O in Box Replaced broken Ex. CAP	15/16

* H2O in Box

ARCO 6041 (Regional WL's)

ALISTO ENGINEERING GROUP
GROUNDWATER MONITORING

Client: BP Oil
Alisto Project No: 10-017-03-003
Service Station No: 1116

Date: 11-18-94
Field Personnel: Dave Cusack
Site Address: 7197 Village Pkwy Dublin

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	TOC	GWE
AW-4	4		32.2	6.80	0			333.41	326.61
AW5	4		32.9	8.20	0			334.81	326.61
AW6	4		16.5	7.17	0			334.90	327.73

Notes:

FORM: FS2/121592

ARCO 6041 (AREA data)

WELL GAUGING DATA

204-2217-0105

Project # 941123J3 Date 11/23/94 Client SHELL

Site 7194 AMADOR VLY. BL, DUBLIN, CA.

Well I.D.	Well Size (in.)	Sheen/ Odor	Depth to Immiscible Liquid (feet)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to Water (feet)	Depth to Well Bottom (feet)	Survey Point: TOB or TOC
MW-1	4					8.74	25.10	TOC
MW-2	4					10.92	24.49	
MW-3	4					10.48	24.18	
MW-4	4					10.78	24.69	
MW-5	4					8.78	24.58	
MW-6	4					9.20	22.80	
MW-7	4					6.75	16.42	
MW-8	4					9.08	16.04	
MW-9	4					8.65	17.80	
MW-11	4					8.27	16.29	
MW-12	4					7.16	17.08	
MW-13	4					9.37	16.97	
BW-1	6					10.07	30.92	

TABLE 1

SUMMARY OF MONITORING DATA
UNOCAL MONITORING WELLS

Well #	Ground Water Elevation (feet)	Depth to Water (feet)*	Total Well Depth (feet)	Product Thickness (feet)	Sheen	Water Purged (gallons)
	TOC					GWE
(Monitored and Sampled November 18, 1994)						
MW1	336.08	326.38	9.69	19.49	0	No	7 ~~326.38~~
MW2*	336.78	326.83	9.95	19.26	0	--	0 326.83
MW3*	336.98	326.83	10.15	18.91	0	--	0 326.83
MW4*	336.42	326.33	10.10	19.44	0	--	0 326.32
MW5	335.96	325.87	10.09	19.99	0	No	7 325.87
(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

PAGE 2 OF 3 DATE: 11-18-94 CLIENT/STATION #: ARCO 6041 ADDRESS: 7249 Village Pkwy Dublin

WELL ID: MW-6 TD 16.13 DTW 9.54 x 0.66 (Gal./Linear Ft.) x 3 (Casing Volume) - 13.04 (Calculated Purge)

DATE PURGED: 11-18-94 START (2400 HR): 1504 END (2400 HR) 1509
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1512 DTW: 12.8

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1505	2	7.63	0.39	71.1	cloudy
1506	6	7.52	0.37	70.8	clear
1508	9	7.42	0.37	70.5	clear
1509	10	7.40	0.37	70.3	clear

Total purge: 10
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: well pumped dry at 9 and again at 10 gallons.

WELL ID: MW-5 TD 17.90 DTW 9.65+ x 0.66 (Gal./Linear Ft.) x 3 (Casing Volume) - 16.32 (Calculated Purge)

DATE PURGED: 11-18-94 START (2400 HR): 1518 END (2400 HR) 1522
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1524 DTW: 14.1

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1520	2	7.42	3.01	68.9	clear
1521	6	7.23	3.45	68.8	clear
1522	10	7.21	3.66	68.6	clear

Total purge: 10
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: well pumped dry at 10 gallons

WELL ID: MW-4 TD 14.90 DTW 8.31 x 0.66 (Gal./Linear Ft.) x 3 (Casing Volume) - 13.04 (Calculated Purge)

DATE PURGED: 11-18-94 START (2400 HR): 1535 END (2400 HR) 1541
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1543 DTW: 11.8

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1537	1	7.38	2.31	71.2	clear
1539	6	7.28	1.80	70.6	clear
1541	7	7.26	1.71	70.4	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: MW-2 TD 14.24 DTW 8.70 x 0.66 (Gal./Linear Ft.) x 3 (Casing Volume) - 10.96 (Calculated Purge)

DATE PURGED: 11-18-94 START (2400 HR): 1546 END (2400 HR) 1551
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1555 DTW: 12.0

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1547	1	7.44	2.46	70.5	clear
1549	3	7.21	1.85	70.3	clear
1551	6	7.19	1.80	70.1	clear

Total purge: 6
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: well pumped at 3, 5, and again at 6 gallons

PRINT NAME: 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:

PAGE 3 OF 3 DATE: 11-18-94 CLIENT/STATION #: 0200 6041 ADDRESS: 7249 Village Pkwy Dublin

WELL ID: MW-3 TD 15.02 DTW 9.79 x 0.66 (Gal. / Linear Ft.) x 3 (Casing Volume) - 10.35 (Calculated Purge)

DATE PURGED: 11-18-94 START (2400 HR): 1558 END (2400 HR) 1604
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1607 DTW: 12.8

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1600	1	7.35	1.37	70.8	clear
1602	5	7.19	0.13	70.4	clear
1604	6	7.17	2.08	70.1	clear

Total purge: 6
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Well pumped dry at 3.5, and again at 6 gallons.

WELL ID: MW-1 TD 17.84 DTW 10.25 x 0.66 (Gal. / Linear Ft.) x 3 (Casing Volume) - 15.02 (Calculated Purge)

DATE PURGED: 11-18-94 START (2400 HR): 1610 END (2400 HR) 1616
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1618 DTW: 15

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1612	1	7.29	2.11	69.0	clear
1614	4	7.18	1.79	68.8	clear
1616	6	7.16	1.74	68.7	clear

Total purge: 6
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Well pumped dry at 3.5, and again at 6 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: _____

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 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.

RECEIVED DEC 2 8 1994

December 22, 1994

Service Request No.: K947395S

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

RECEIVED
DEC 2 8 1994

Re: **ARCO Dublin/Project# SJ94-1509**

Dear Ms. Austin/Mr. DeLon:

Enclosed are the results of the sample(s) submitted to our laboratory on November 18, 1994. For your reference, these analyses have been assigned our service request number K947395S.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (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. My extension is 239.

Respectfully submitted,

Columbia Analytical Services, Inc.

Howard Boorse
Project Chemist

HB/sl

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-1068

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
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
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
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected at or above the MRL
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	IWA	**Service Request:**	K947395S
Project:	ARCO Dublin/#6041	**Date Collected:**	11/18/94
Sample Matrix:	Water	**Date Received:**	11/28/94
		Date Extracted:	NA
		Date Analyzed:	11/29,30/94

BTEX and Total Petroleum Hydrocarbons as Gasoline
EPA Methods 5030/8020 and California DHS LUFT Method
Units: µg/L (ppb)

Analyte:	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPH as Gasoline
Method Reporting Limit:	0.5	0.5	0.5	1	50
Sample Name	**Lab Code**				
MW-1	K947395-001	1.5	ND	1.4	ND	2500
MW-2	K947395-002	1.9	0.6	ND	ND	237(a)
MW-3	K947395-003	3.5	ND	0.9	ND	1850(a)
MW-4	K947395-004	ND	ND	ND	ND	ND
MW-5	K947395-005	ND	ND	ND	ND	ND
MW-6	K947395-006	ND	ND	ND	ND	ND
FB-1	K947395-007	ND	ND	ND	ND	ND
Method Blank	K941129-WB	ND	ND	ND	ND	ND

a Quantified as gasoline. The sample contained a single, discrete peak which eluted within the gasoline range.

Approved By: _____ Date: 12/22/94

00003

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWA
Project: ARCO Dublin/#6041
Sample Matrix: Water

Service Request: K947395S
Date Collected: 11/18/94
Date Received: 11/28/94
Date Extracted: NA
Date Analyzed: 11/29,30/94

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

Sample Name	Lab Code	Percent Recovery 4-BFB (PID - BTEX)	Percent Recovery 4-BFB (FID - GAS)
MW-1	K947395-001	84	101
MW-2	K947395-002	92	97
MW-3	K947395-003	92	101
MW-4	K947395-004	91	90
MW-5	K947395-005	91	94
MW-6	K947395-006	92	96
FB-1	K947395-007	93	95
MW-1	K947395-001D	85	107
MW-3	K947395-003MS	94	-
Batch QC	K947394-006MS	-	99
Laboratory Control Sample	K941129-WL	97	101
Method Blank	K941129-WB	91	97

CAS Acceptance Limits: 70-122 51-143

Approved By: _____ Date: 12/22/94

00004

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWA
Project: ARCO Dublin/#6041
Sample Matrix: Water

Service Request: K947395S
Date Collected: 11/18/94
Date Received: 11/28/94
Date Extracted: NA
Date Analyzed: 11/30/94

Duplicate Summary
BTEX and Total Petroleum Hydrocarbons as Gasoline
EPA Methods 5030/8020 and California DHS LUFT Method
Units: µg/L (ppb)

Sample Name: MW-1
Lab Code: K947395-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	CAS RPD Acceptance Limit
Benzene	0.5	1.5	1.5	1.5	<1	30
Toluene	0.5	ND	ND	ND	-	30
Ethylbenzene	0.5	1.4	1.3	1.4	7	30
Total Xylenes	0.1	ND	ND	ND	-	30
Gasoline	50	2500	2460	2480	2	30

Approved By: _____ Date: 12/22/94

00005

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWA
Project: ARCO Dublin/#6041
Sample Matrix: Water

Service Request: K947395S
Date Collected: 11/18/94
Date Received: 11/28/94
Date Extracted: NA
Date Analyzed: 11/30/94

Matrix Spike Summary
BTEX and Total Petroleum Hydrocarbons as Gasoline
EPA Methods 5030/8020 and California DHS LUFT Method
Units: µg/L (ppb)

Sample Name: MW-3
Lab Code: K947395-003

Analyte	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	0.5	100	3.5	87.7	84	56-129
Toluene	0.5	100	ND	81.0	81	61-126
Ethylbenzene	0.5	100	0.9	76.6	76	54-132

Approved By: _____ Date: 12/22/94

00006

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWA	**Service Request:**	K947395S
Project:	ARCO Dublin/#6041	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	11/30/94

Matrix Spike Summary
BTEX and Total Petroleum Hydrocarbons as Gasoline
EPA Methods 5030/8020 and California DHS LUFT Method
Units: µg/L (ppb)

Sample Name: Batch QC
Lab Code: K947394-006

Analyte	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Gasoline	50	2500	98	2670	103	52-133

Approved By: _____ Date: 12/22/94

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWA	**Service Request:**	K947395S
Project:	ARCO Dublin/#6041	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	11/30/94

Laboratory Control Sample Summary
BTEX and Total Petroleum Hydrocarbons as Gasoline
EPA Methods 5030/8020 and California DHS LUFT Method
Units: µg/L (ppb)

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	100	85.1	85	70-120
Toluene	100	84.9	85	73-120
Ethylbenzene	100	82.0	82	72-125
Gasoline	2500	2610	104	74-141

Approved By: Howard Bowe Date: 12/22/94

00008

LCS/102194

K947395S.XLS - BTXwLCS 12/22/94

APPENDIX B

CHAIN OF CUSTODY INFORMATION