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

ENVIRONMENTAL
PROTECTION

95 MAR -3 AM 11:54

Date March 1, 1995
Project 0805-120.02

To:

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

We are enclosing:

Copies	Description
1	Third quarter 1994 groundwater monitoring report, retail service station, 10600 MacArthur Boulevard, Oakland, CA

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

cc: Kevin Graves, RWQCB - SFBR
Richard Gilcrease, Drake Builders
Rosanna Garrison, Augeas Consultants
Michael Whelan, ARCO Products Company
David Larsen, EMCON
File

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

Date: March 1, 1995

Re: ARCO Station # 10600 MacArthur Boulevard • Oakland, 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
1921 Ringwood Avenue • San Jose, California 95131-1721 • (408) 453-7300 • Fax (408) 437-9526

March 1, 1995
Project 0805-120.02

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

Re: Third quarter 1994 groundwater monitoring program results, retail service station, 10600 MacArthur Boulevard, Oakland, California

Dear Mr. Whelan:

This letter presents the results of the third quarter 1994 groundwater monitoring program for the retail service station at 10600 MacArthur Boulevard, Oakland, California (Figure 1). A former truck manufacturing plant was located adjacent to the service station on the property currently owned by Drake Builders and now operated as Foothill Square Shopping Center. The quarterly monitoring program complies with Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

MONITORING PROGRAM FIELD PROCEDURES AND RESULTS

The third quarter 1994 groundwater monitoring event was performed by Integrated Wastestream Management, Inc. (IWM), on August 3, 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-8, RW-1, and WGR-3, (2) purging and subsequently sampling groundwater monitoring wells MW-1 through MW-8, RW-1, and WGR-3 for laboratory analysis, and (3) directing a state-certified laboratory to analyze the groundwater samples. Well MW-2 was inaccessible due to a parked vehicle and was not monitored during third quarter 1994. The results of IWM's field work were transmitted to EMCON in a report dated August 24, 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); benzene, toluene, ethylbenzene, and total xylenes (BTEX); and volatile organic compounds (VOCs). 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 VOCs by USEPA method 8240, and BTEX by USEPA method 8020, as described in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (USEPA, SW-846, November 1986, Third Edition). Groundwater samples collected from well MW-4 were also analyzed for total recoverable petroleum hydrocarbons (TRPH) by USEPA method 418.1. These methods are recommended for samples from petroleum-hydrocarbon-impacted sites in the *Tri-Regional Board Staff Recommendations 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. Tetrachloroethene (PCE) concentrations in groundwater are illustrated in Figure 3. Historical groundwater elevation data, including top-of-casing elevations, depth-to-water measurements, calculated groundwater elevations, floating-product thickness measurements, and groundwater flow direction and gradient data, are summarized in Table 2. Table 3 summarizes historical laboratory data for TPHG and BTEX analyses. Table 4 summarizes additional historical laboratory data for well MW-4 (TRPH, TPHD, and metals). Historical laboratory data for VOC analyses are summarized in Table 5. Table 6 summarizes historical floating product recovery data for wells MW-2 and MW-7. Copies of the third quarter 1994 analytical results and chain-of-custody documentation are included in Appendix B.

MONITORING PROGRAM EVALUATION

Groundwater elevation data collected on August 3, 1994, were used to illustrate groundwater contours for third quarter 1994 (Figure 2). Using groundwater elevation data from wells MW-4, MW-5, and MW-8, EMCON calculated the approximate direction of flow and hydraulic gradient to be southwest and 0.002 foot per foot, respectively. Figure 2 illustrates groundwater contours and TPHG and benzene analytical data for third quarter 1994.

Well MW-2 was inaccessible due to a parked vehicle and was not sampled during the third quarter of 1994. Groundwater samples collected from wells MW-1, MW-3 through MW-6, MW-8, RW-1, and WGR-3 did not contain detectable concentrations of TPHG or BTEX. Detection limits for TPHG and BTEX were less than 50 parts per billion (ppb)

and less than 0.5 ppb, respectively, with the exception of samples collected from wells MW-3, MW-4, MW-6, and RW-1, where detection limits were raised because of the presence of another VOC, possibly PCE, in the samples. Groundwater samples collected from well MW-7 contained 47,000 ppb TPHG and 1,000 ppb benzene. Groundwater samples collected from well MW-4 did not contain detectable concentrations of TRPH (<500 ppb). Similar analytical results were reported for these wells during previous monitoring events (Tables 3 and 4).

Groundwater samples collected from wells MW-7, MW-8, and WGR-3 did not contain detectable concentrations of VOCs. Groundwater samples collected from wells MW-1, MW-3 through MW-6, and RW-1 contained concentrations of PCE from 14 to 1,400 ppb (Figure 3). Similar analytical results were reported for all wells during previous monitoring events (Table 5).

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
- Perform startup of the SVE system

Please call if you have questions.

Sincerely,

EMCON

David Larsen
Project Coordinator

Mark Smolley, R.G. 4650
Senior Project Geologist

Attachments:
- 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 Analytical Data (TRPH, TPHD, and Metals)
- Table 5 - Historical Groundwater Analytical Data (Volatile Organic Compounds)
- Table 6 - Approximate Cumulative Floating Product Recovered
- Figure 1 - Site Location
- Figure 2 - Groundwater Data, Third Quarter 1994
- Figure 3 - Tetrachloroethene (PCE) Concentrations in Groundwater, Third Quarter 1994
- Appendix A - Field Data Report, Integrated Wastestream Management, August 24, 1994
- Appendix B - Analytical Results and Chain-of-Custody Documentation, Third Quarter 1994

cc: Barney Chan, ACHCSA
Kevin Graves, RWQCB-SFBR
Richard Gilcrease, Drake Builders
Rosanna Garrison, Augeas Consultants

Table 1
Groundwater Monitoring Data
Third Quarter 1994

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

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	08-03-94	55.92	32.54	23.38	ND	SW	0.002	08-03-94	<50	<0.5	<0.5	<0.5	<0.5
MW-2	08-03-94	55.10	Not surveyed: well was inaccessible due to a parked car					08-03-94	Not sampled: well was inaccessible due to a parked car				
MW-3	08-03-94	56.55	33.09	23.46	ND	SW	0.002	08-03-94	<250*	<0.5	<0.5	<0.5	<0.5
MW-4	08-03-94	55.98	32.53	23.45	ND	SW	0.002	08-03-94	<400*	<0.5	<0.5	<0.5	<0.5
MW-5	08-03-94	55.43	32.05	23.38	ND	SW	0.002	08-03-94	<50	<0.5	<0.5	<0.5	<0.5
MW-6	08-03-94	61.21	37.97	23.24	ND	SW	0.002	08-03-94	<660*	<1***	<1***	<1***	<1***
MW-7	08-03-94	58.22	22.66	35.56	ND	SW	0.002	08-03-94	47000	1000	1200	1500	10000
MW-8	08-03-94	53.65	30.33	23.32	ND	SW	0.002	08-03-94	<50	<0.5	<0.5	<0.5	<0.5
RW-1	08-03-94	56.32	32.90	23.42	ND	SW	0.002	08-03-94	<140*	<0.5	<0.5	<0.5	<0.5
WGR-3	08-03-94	NR	22.30	NR	ND	NR	NR	08-03-94	<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
TOG = Total oil and grease measured by EPA Method 5520 C&F
TRPH = Total recoverable petroleum hydrocarbons measured by EPA Method 418.1
ppb = Parts per billion or micrograms per liter (µg/l)
ND = None detected
SW = Southwest
* = Raised method reporting limit due to matrix interference. The sample contains a single non-fuel component eluting in the gasoline range and quantitated as gasoline (possibly PCE).
The chromatogram does not match the typical gasoline fingerprint.
*** = Raised method reporting limit due to high analyte concentration requiring sample dilution
NR = Not reported; data not available or not measurable

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Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

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	04-17-89	55.91	33.04	22.87	ND	NR	NR
MW-1	04-24-89	55.91	33.84	22.07	ND	NR	NR
MW-1	10-13-89	55.91	37.19	18.72	ND	NR	NR
MW-1	02-01-90	55.91	36.73	19.18	ND	NR	NR
MW-1	07-31-90	55.91	36.42	19.49	ND	NR	NR
MW-1	08-01-90	55.91	36.41	19.50	ND	NR	NR
MW-1	08-28-90	55.91	36.88	19.03	ND	NR	NR
MW-1	10-30-90	55.91	37.73	18.18	ND	NR	NR
MW-1	11-20-90	55.91	37.92	17.99	ND	NR	NR
MW-1	12-19-90	55.91	37.90	18.01	ND	NR	NR
MW-1	01-30-91	55.91	38.06	17.85	ND	NR	NR
MW-1	02-27-91	55.91	37.66	18.25	ND	NR	NR
MW-1	03-20-91	55.91	36.77	19.14	ND	NR	NR
MW-1	04-30-91	55.91	34.63	21.28	ND	NR	NR
MW-1	05-31-91	55.91	34.83	21.08	ND	NR	NR
MW-1	07-24-91	55.91	35.96	19.95	ND	NR	NR
MW-1	08-06-91	55.91	36.21	19.70	ND	NR	NR
MW-1	09-03-91	55.91	36.74	19.17	ND	NR	NR
MW-1	10-17-91	55.91	37.57	18.34	ND	NR	NR
MW-1	11-05-91	55.91	37.65	18.26	ND	NR	NR
MW-1	12-24-91	55.91	38.14	17.77	ND	NR	NR
MW-1	01-19-92	55.91	37.62	18.29	ND	NR	NR
MW-1	02-20-92	55.91	36.23	19.68	ND	NR	NR
MW-1	03-10-92	55.91	34.58	21.33	ND	NR	NR
MW-1	04-20-92	55.91	32.82	23.09	ND	NR	NR
MW-1	05-15-92	55.91	33.17	22.74	ND	NR	NR
MW-1	06-30-92	55.91	34.55	21.36	ND	NR	NR
MW-1	07-15-92	55.91	34.90	21.01	ND	NR	NR
MW-1	08-25-92	55.92	35.34	20.58	ND	NR	NR
MW-1	09-09-92	55.92	35.71	20.21	ND	NR	NR
MW-1	10-31-92	55.92	36.62	19.30	ND	NR	NR
MW-1	11-20-92	55.92	36.90	19.02	ND	NR	NR
MW-1	12-16-92	55.92	36.18	19.74	ND	NR	NR
MW-1	01-22-93	55.92	32.24	23.68	ND	NR	NR
MW-1	02-12-93	55.92	30.65	25.27	ND	NR	NR
MW-1	03-26-93	55.92	28.36	27.56	ND	NR	NR
MW-1	04-30-93	55.92	28.45	27.47	ND	NR	NR
MW-1	05-12-93	55.92	28.88	27.04	ND	NR	NR
MW-1	06-17-93	55.92	29.67	26.25	ND	NR	NR
MW-1	08-18-93	55.92	31.44	24.48	ND	NR	NR
MW-1	11-10-93	55.92	33.33	22.59	ND	NR	NR
MW-1	02-04-94	55.92	24.48	31.44	ND	NR	NR
MW-1	05-02-94	55.92	31.66	24.26	ND	NR	NR
MW-1	08-03-94	55.92	32.54	23.38	ND	SW	0.002

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

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	04-17-89	55.35	17.20	38.15	ND	NR	NR
MW-2	04-24-89	55.35	17.83	37.52	ND	NR	NR
MW-2	10-13-89	55.35	^20.15	^35.20	0.03	NR	NR
MW-2	02-01-90	55.35	NR	NR	NR	NR	NR
MW-2	07-31-90	55.35	18.90	36.45	ND	NR	NR
MW-2	08-01-90	55.35	^18.23	^37.03	1.04	NR	NR
MW-2	08-28-90	55.35	^21.25	^34.10	0.83	NR	NR
MW-2	10-30-90	55.35	^24.21	^31.14	1.04	NR	NR
MW-2	11-20-90	55.35	^25.08	^30.27	0.60	NR	NR
MW-2	12-19-90	55.35	^18.23	^37.12	ND	NR	NR
MW-2	01-30-91	55.35	^19.47	^35.88	0.03	NR	NR
MW-2	02-27-91	55.35	^18.84	^36.51	0.02	NR	NR
MW-2	03-20-91	55.35	^16.02	^39.33	0.01	NR	NR
MW-2	04-30-91	55.35	16.55	38.80	Sheen	NR	NR
MW-2	05-31-91	55.35	^18.41	^36.94	0.01	NR	NR
MW-2	07-24-91	55.35	19.81	35.54	Sheen	NR	NR
MW-2	08-06-91	55.35	^20.59	^34.76	0.14	NR	NR
MW-2	09-03-91	55.35	^23.23	^32.12	0.54	NR	NR
MW-2	10-17-91	55.35	^24.81	^30.54	0.20	NR	NR
MW-2	11-05-91	55.35	^18.88	^36.47	0.01	NR	NR
MW-2	12-24-91	55.35	^19.34	^36.01	0.09	NR	NR
MW-2	01-19-92	55.35	18.00	37.35	Sheen	NR	NR
MW-2	02-20-92	55.35	14.81	40.54	Skimmer	NR	NR
MW-2	03-10-92	55.35	14.95	40.40	Skimmer	NR	NR
MW-2	04-20-92	55.35	16.13	39.22	ND	NR	NR
MW-2	05-15-92	55.35	17.66	37.69	ND	NR	NR
MW-2	06-30-92	55.35	19.11	36.24	Sheen	NR	NR
MW-2	07-15-92	55.35	19.50	35.85	ND	NR	NR
MW-2	08-25-92	55.10	^21.35	^33.73	0.05	NR	NR
MW-2	09-09-92	55.10	^22.70	^32.40	0.05	NR	NR
MW-2	10-31-92	55.10	22.34	32.76	ND	NR	NR
MW-2	11-20-92	55.10	^19.85	^32.25	0.02^^	NR	NR
MW-2	12-16-92	55.10	NR	NR	NR	NR	NR
MW-2	01-22-93	55.10	13.10	42.00	ND	NR	NR
MW-2	02-12-93	55.10	14.71	40.39	0.05^^	NR	NR
MW-2	03-26-93	55.10 Not surveyed: well was inaccessible					
MW-2	04-30-93	55.10	15.48	39.62	ND	NR	NR
MW-2	05-12-93	55.10	^15.81	^39.29	0.01	NR	NR
MW-2	06-17-93	55.10	18.45	36.65	ND	NR	NR
MW-2	08-18-93	55.10	NR	NR	NR	NR	NR
MW-2	11-10-93	55.10	21.24	33.86	ND^^	NR	NR
MW-2	02-04-94	55.10	16.42	38.68	ND	NR	NR
MW-2	05-02-94	55.10	16.15	38.95	ND	NR	NR
MW-2	08-03-94	55.10 Not surveyed: well was inaccessible due to a parked car					

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

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	04-24-89	56.55	34.47	22.08	ND	NR	NR
MW-3	10-13-89	56.55	37.60	18.95	ND	NR	NR
MW-3	02-01-90	56.55	37.20	19.35	ND	NR	NR
MW-3	07-31-90	56.55	36.90	19.65	ND	NR	NR
MW-3	08-01-90	56.55	36.87	19.68	ND	NR	NR
MW-3	08-28-90	56.55	37.33	19.22	ND	NR	NR
MW-3	10-30-90	56.55	38.15	18.40	ND	NR	NR
MW-3	11-20-90	56.55	38.33	18.22	ND	NR	NR
MW-3	12-19-90	56.55	38.30	18.25	ND	NR	NR
MW-3	01-30-91	56.55	DRY	DRY	ND	NR	NR
MW-3	02-27-91	56.55	38.11	18.44	ND	NR	NR
MW-3	03-20-91	56.55	37.26	19.29	ND	NR	NR
MW-3	04-30-91	56.55	35.02	21.53	ND	NR	NR
MW-3	05-31-91	56.55	35.26	21.29	ND	NR	NR
MW-3	07-24-91	56.55	36.40	20.15	ND	NR	NR
MW-3	08-06-91	56.55	36.66	19.89	ND	NR	NR
MW-3	09-03-91	56.55	37.20	19.35	ND	NR	NR
MW-3	10-17-91	56.55	38.04	18.51	ND	NR	NR
MW-3	11-05-91	56.55	38.08	18.47	ND	NR	NR
MW-3	12-24-91	56.55	DRY	DRY	ND	NR	NR
MW-3	01-19-92	56.55	38.07	18.48	ND	NR	NR
MW-3	02-20-92	56.55	36.71	19.84	ND	NR	NR
MW-3	03-10-92	56.55	34.96	21.59	ND	NR	NR
MW-3	04-20-92	56.55	33.20	23.35	ND	NR	NR
MW-3	05-15-92	56.55	33.70	22.85	ND	NR	NR
MW-3	06-30-92	56.55	34.97	21.58	ND	NR	NR
MW-3	07-15-92	56.55	35.35	21.20	ND	NR	NR
MW-3	08-25-92	56.55	35.94	20.61	ND	NR	NR
MW-3	09-09-92	56.55	36.19	20.36	ND	NR	NR
MW-3	10-31-92	56.55	36.13	20.42	ND	NR	NR
MW-3	11-20-92	56.55	37.40	19.15	ND	NR	NR
MW-3	12-16-92	56.55	36.68	19.87	ND	NR	NR
MW-3	01-22-93	56.55	32.58	23.97	ND	NR	NR
MW-3	02-12-93	56.55	30.86	25.69	ND	NR	NR
MW-3	03-26-93	56.55	28.60	27.95	ND	NR	NR
MW-3	04-30-93	56.55	28.79	27.76	ND	NR	NR
MW-3	05-12-93	56.55	29.17	27.38	ND	NR	NR
MW-3	06-17-93	56.55	30.11	26.44	ND	NR	NR
MW-3	08-18-93	56.55	31.91	24.64	ND	NR	NR
MW-3	11-10-93	56.55	33.80	22.75	ND	NR	NR
MW-3	02-04-94	56.55	33.58	22.97	ND	NR	NR
MW-3	05-02-94	56.55	32.16	24.39	ND	NR	NR
MW-3	08-03-94	56.55	33.09	23.46	ND	SW	0.002

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

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	04-17-89	55.94	33.87	22.07	ND	NR	NR
MW-4	04-24-89	55.94	33.76	22.18	ND	NR	NR
MW-4	10-13-89	55.94	37.03	18.91	ND	NR	NR
MW-4	02-01-90	55.94	36.57	19.37	ND	NR	NR
MW-4	07-31-90	55.94	36.39	19.55	ND	NR	NR
MW-4	08-01-90	55.94	36.32	19.62	ND	NR	NR
MW-4	08-28-90	55.94	36.79	19.15	ND	NR	NR
MW-4	10-30-90	55.94	37.62	18.32	ND	NR	NR
MW-4	11-20-90	55.94	37.82	18.12	ND	NR	NR
MW-4	12-19-90	55.94	37.74	18.20	ND	NR	NR
MW-4	01-30-91	55.94	37.97	17.97	ND	NR	NR
MW-4	02-27-91	55.94	37.52	18.42	ND	NR	NR
MW-4	03-20-91	55.94	36.69	19.25	ND	NR	NR
MW-4	04-30-91	55.94	34.48	21.46	ND	NR	NR
MW-4	05-31-91	55.94	34.73	21.21	ND	NR	NR
MW-4	07-24-91	55.94	35.86	20.08	ND	NR	NR
MW-4	08-06-91	55.94	36.15	19.79	ND	NR	NR
MW-4	09-03-91	55.94	36.66	19.28	ND	NR	NR
MW-4	10-17-91	55.94	37.49	18.45	ND	NR	NR
MW-4	11-05-91	55.94	37.54	18.40	ND	NR	NR
MW-4	12-24-91	55.94	38.01	17.93	ND	NR	NR
MW-4	01-19-92	55.94	37.48	18.46	ND	NR	NR
MW-4	02-20-92	55.94	36.11	19.83	ND	NR	NR
MW-4	03-10-92	55.94	34.96	20.98	ND	NR	NR
MW-4	04-20-92	55.94	32.60	23.34	ND	NR	NR
MW-4	05-15-92	55.94	33.12	22.82	ND	NR	NR
MW-4	06-30-92	55.94	34.06	21.88	ND	NR	NR
MW-4	07-15-92	55.94	NR	NR	NR	NR	NR
MW-4	08-25-92	55.98	35.22	20.76	ND	NR	NR
MW-4	09-09-92	55.98	35.63	20.35	ND	NR	NR
MW-4	10-31-92	55.98	33.84	22.14	ND	NR	NR
MW-4	11-20-92	55.98	36.87	19.11	ND	NR	NR
MW-4	12-16-92	55.98	36.09	19.89	ND	NR	NR
MW-4	01-22-93	55.98	31.98	24.00	ND	NR	NR
MW-4	02-12-93	55.98	30.31	25.67	ND	NR	NR
MW-4	03-26-93	55.98	27.97	28.01	ND	NR	NR
MW-4	04-30-93	55.98	28.24	27.74	ND	NR	NR
MW-4	05-12-93	55.98	28.60	27.38	ND	NR	NR
MW-4	06-17-93	55.98	29.54	26.44	ND	NR	NR
MW-4	08-18-93	55.98	31.37	24.61	ND	NR	NR
MW-4	11-10-93	55.98	33.27	22.71	ND	NR	NR
MW-4	02-04-94	55.98	33.07	22.91	ND	NR	NR
MW-4	05-02-94	55.98	31.60	24.38	ND	NR	NR
MW-4	08-03-94	55.98	32.53	23.45	ND	SW	0.002

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

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-5	04-17-89	55.43	33.17	22.26	ND	NR	NR
MW-5	04-24-89	55.43	33.06	22.37	ND	NR	NR
MW-5	10-13-89	55.43	36.33	19.10	ND	NR	NR
MW-5	02-01-90	55.43	35.96	19.47	ND	NR	NR
MW-5	07-31-90	55.43	35.70	19.73	ND	NR	NR
MW-5	08-01-90	55.43	35.69	19.74	ND	NR	NR
MW-5	08-28-90	55.43	36.14	19.29	ND	NR	NR
MW-5	10-30-90	55.43	36.94	18.49	ND	NR	NR
MW-5	11-20-90	55.43	37.09	18.34	ND	NR	NR
MW-5	12-19-90	55.43	37.05	18.38	ND	NR	NR
MW-5	01-30-91	55.43	37.26	18.17	ND	NR	NR
MW-5	02-27-91	55.43	36.81	18.62	ND	NR	NR
MW-5	03-20-91	55.43	36.04	19.39	ND	NR	NR
MW-5	04-30-91	55.43	33.75	21.68	ND	NR	NR
MW-5	05-31-91	55.43	34.01	21.42	ND	NR	NR
MW-5	07-24-91	55.43	35.20	20.23	ND	NR	NR
MW-5	08-06-91	55.43	35.48	19.95	ND	NR	NR
MW-5	09-03-91	55.43	36.00	19.43	ND	NR	NR
MW-5	10-17-91	55.43	36.84	18.59	ND	NR	NR
MW-5	11-05-91	55.43	36.86	18.57	ND	NR	NR
MW-5	12-24-91	55.43	37.31	18.12	ND	NR	NR
MW-5	01-19-92	55.43	36.95	18.48	ND	NR	NR
MW-5	02-20-92	55.43	35.39	20.04	ND	NR	NR
MW-5	03-10-92	55.43	33.67	21.76	ND	NR	NR
MW-5	04-20-92	55.43	31.80	23.63	ND	NR	NR
MW-5	05-15-92	55.43	32.37	23.06	ND	NR	NR
MW-5	06-30-92	55.43	34.00	21.43	ND	NR	NR
MW-5	07-15-92	55.43	34.32	21.11	ND	NR	NR
MW-5	08-25-92	55.43	35.76	19.67	ND	NR	NR
MW-5	09-09-92	55.43	34.97	20.46	ND	NR	NR
MW-5	10-31-92	55.43	35.97	19.46	ND	NR	NR
MW-5	11-20-92	55.43	36.26	19.17	ND	NR	NR
MW-5	12-16-92	55.43	35.45	19.98	ND	NR	NR
MW-5	01-22-93	55.43	31.05	24.38	ND	NR	NR
MW-5	02-12-93	55.43	29.42	26.01	ND	NR	NR
MW-5	03-26-93	55.43	27.07	28.36	ND	NR	NR
MW-5	04-30-93	55.43	27.40	28.03	ND	NR	NR
MW-5	05-12-93	55.43	27.83	27.60	ND	NR	NR
MW-5	06-17-93	55.43	28.84	26.59	ND	NR	NR
MW-5	08-18-93	55.43	30.75	24.68	ND	NR	NR
MW-5	11-10-93	55.43	32.70	22.73	ND	NR	NR
MW-5	02-04-94	55.43	32.45	22.98	ND	NR	NR
MW-5	05-02-94	55.43	31.06	24.37	ND	NR	NR
MW-5	08-03-94	55.43	32.05	23.38	ND	SW	0.002

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

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-6	06-30-92	61.21	35.50	25.71	ND	NR	NR
MW-6	07-15-92	61.21	39.89	21.32	ND	NR	NR
MW-6	08-25-92	61.21	34.90	26.31	ND	NR	NR
MW-6	09-09-92	61.21	Not surveyed: well was paved over				
MW-6	10-31-92	61.21	NR	NR	NR	NR	NR
MW-6	11-20-92	61.21	Not surveyed: well was paved over				
MW-6	12-16-92	61.21	NR	NR	NR	NR	NR
MW-6	01-22-93	61.21	36.52	24.69	ND	NR	NR
MW-6	02-12-93	61.21	35.65	25.56	ND	NR	NR
MW-6	03-28-93	61.21	33.33	27.88	ND	NR	NR
MW-6	04-30-93	61.21	33.56	27.65	ND	NR	NR
MW-6	05-12-93	61.21	33.95	27.26	ND	NR	NR
MW-6	06-17-93	61.21	34.90	26.31	ND	NR	NR
MW-6	08-18-93	61.21	36.72	24.49	ND	NR	NR
MW-6	11-10-93	61.21	38.64	22.57	ND	NR	NR
MW-6	02-04-94	61.21	38.48	22.73	ND	NR	NR
MW-6	05-02-94	61.21	37.02	24.19	ND	NR	NR
MW-6	08-03-94	61.21	37.97	23.24	ND	SW	0.002
MW-7	06-30-92	58.22	23.70	34.52	ND	NR	NR
MW-7	07-15-92	58.22	23.10	35.12	ND	NR	NR
MW-7	08-25-92	58.22	34.23	23.99	ND	NR	NR
MW-7	09-09-92	58.22	^26.30	^31.92	1.31	NR	NR
MW-7	10-31-92	58.22	35.44	22.78	ND	NR	NR
MW-7	11-20-92	58.22	^23.47	^34.75	0.02	NR	NR
MW-7	12-16-92	58.22	^19.07	^39.15	0.04	NR	NR
MW-7	01-22-93	58.22	^16.56	^41.66	0.02	NR	NR
MW-7	02-12-93	58.22	^18.22	^40.00	0.04	NR	NR
MW-7	03-26-93	58.22	18.04	40.18	ND	NR	NR
MW-7	04-30-93	58.22	19.34	38.88	NR	NR	NR
MW-7	05-12-93	58.22	^19.80	^38.42	0.01	NR	NR
MW-7	06-17-93	58.22	^22.63	^35.59	0.01	NR	NR
MW-7	08-18-93	58.22	22.44	35.78	0.01	NR	NR
MW-7	11-10-93	58.22	24.51	33.71	ND^^	NR	NR
MW-7	02-04-94	58.22	20.78	37.44	ND	NR	NR
MW-7	05-02-94	58.22	20.51	37.71	ND	NR	NR
MW-7	08-03-94	58.22	22.66	35.56	ND	SW	0.002

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

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-8	08-25-92	53.65	NR	NR	NR	NR	NR
MW-8	09-09-92	53.65	33.20	20.45	ND	NR	NR
MW-8	10-31-92	53.65	37.12	16.53	ND	NR	NR
MW-8	11-24-92	53.65	34.45	19.20	ND	NR	NR
MW-8	12-16-92	53.65	NR	NR	NR	NR	NR
MW-8	01-22-93	53.65	28.59	25.06	ND	NR	NR
MW-8	02-12-93	53.65	27.57	26.08	ND	NR	NR
MW-8	03-26-93	53.65	25.16	28.49	ND	NR	NR
MW-8	04-30-93	53.65	25.50	28.15	ND	NR	NR
MW-8	05-12-93	53.65	25.95	27.70	ND	NR	NR
MW-8	06-17-93	53.65	NR	NR	NR	NR	NR
MW-8	08-18-93	53.65	28.97	24.68	ND	NR	NR
MW-8	11-10-93	53.65	30.96	22.69	ND	NR	NR
MW-8	02-04-94	53.65	30.73	22.92	ND	NR	NR
MW-8	05-02-94	53.65	29.26	24.39	ND	NR	NR
MW-8	08-03-94	53.65	30.33	23.32	ND	SW	0.002
RW-1	11-05-91	56.32	37.89	18.43	ND	NR	NR
RW-1	12-24-91	56.32	38.35	17.97	ND	NR	NR
RW-1	01-19-92	56.32	37.82	18.50	ND	NR	NR
RW-1	02-20-92	56.32	36.42	19.90	ND	NR	NR
RW-1	03-10-92	56.32	34.74	21.58	ND	NR	NR
RW-1	04-20-92	56.32	32.90	23.42	ND	NR	NR
RW-1	05-15-92	56.32	33.43	22.89	ND	NR	NR
RW-1	06-30-92	56.32	34.74	21.58	ND	NR	NR
RW-1	07-15-92	56.32	35.12	21.20	ND	NR	NR
RW-1	08-25-92	56.32	36.75	19.57	ND	NR	NR
RW-1	09-09-92	56.32	35.99	20.33	ND	NR	NR
RW-1	10-31-92	56.32	34.32	22.00	ND	NR	NR
RW-1	11-20-92	56.32	37.11	19.21	ND	NR	NR
RW-1	12-16-92	56.32	36.40	19.92	ND	NR	NR
RW-1	01-22-93	56.32	32.30	24.02	ND	NR	NR
RW-1	02-12-93	56.32	30.64	25.68	ND	NR	NR
RW-1	03-26-93	56.32	28.32	28.00	ND	NR	NR
RW-1	04-30-93	56.32	28.55	27.77	ND	NR	NR
RW-1	05-12-93	56.32	28.94	27.38	ND	NR	NR
RW-1	06-17-93	56.32	29.89	26.43	ND	NR	NR
RW-1	08-18-93	56.32	31.74	24.58	ND	NR	NR
RW-1	11-10-93	56.32	33.61	22.71	ND	NR	NR
RW-1	02-04-94	56.32	33.43	22.89	ND	NR	NR
RW-1	05-02-94	56.32	31.96	24.36	ND	NR	NR
RW-1	08-03-94	56.32	32.90	23.42	ND	SW	0.002

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

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
WGR-3	05-02-94	NR	20.06	NR	ND	NR	NR
WGR-3	08-03-94	NR	22.30	NR	ND	NR	NR

TOC = Top of casing (Groundwater elevation = TOC - depth to water)
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
SW = Southwest
^ = Depth to water (DTW) and groundwater elevation (GWE) were adjusted as follows: The thickness of the floating product (FPT) and the depth to water were recorded. The recorded thickness of floating product was then multiplied by 0.80 to obtain an approximate value for the displacement of water by the floating product. The approximate displacement value was then subtracted from the measured depth to water to obtain a calculated depth to water (potentiometric surface). GWE = TOC - [DTW - (FPT x 0.8)]
^^ = Floating product entered the well during purging
DRY = Dry well; groundwater was not detected

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ppb	ppb	ppb	ppb	ppb
MW-1	04-24-89	<50	<0.5	<0.5	<0.5	<0.5
MW-1	10-13-89	<20	<0.5	<0.5	<0.5	<0.5
MW-1	02-01-90	91#	<0.3	<0.3	<0.3	0.36
MW-1	07-31-90	<20	<0.5	<0.5	<0.5	<0.5
MW-1	10-30-90	<50	<0.5	<0.5	<0.5	<0.5
MW-1	01-30-91	<50	<0.5	<0.5	<0.5	<0.5
MW-1	04-30-91	<30	<0.3	<0.3	<0.3	<0.3
MW-1	08-06-91	<30	<0.3	<0.3	<0.3	<0.3
MW-1	11-05-91	<30	<0.3	<0.3	<0.3	<0.3
MW-1	03-10-92	<50	<0.5	<0.5	<0.5	<0.5
MW-1	06-30-92	<50	<0.5	<0.5	<0.5	<0.5
MW-1	09-09-92	<50	<0.5	<0.5	<0.5	<0.5
MW-1	11-20-92	<50	<0.5	<0.5	<0.5	<0.5
MW-1	02-12-93	<50	<0.5	<0.5	<0.5	<0.5
MW-1	05-12-93	<100*	<0.5	<0.5	<0.5	<0.5
MW-1	08-18-93	<51*	<0.5	<0.5	<0.5	<0.5
MW-1	11-10-93	<50	<0.5	<0.5	<0.5	<0.5
MW-1	02-04-94	<50	<0.5	<0.5	<0.5	<0.5
MW-1	05-02-94	<50	<0.5	<0.5	<0.5	<0.5
MW-1	08-03-94	<50	<0.5	<0.5	<0.5	<0.5
MW-2	04-24-89	165000	13000	21000	2100	12700
MW-2	10-13-89	Not sampled: well contained floating product				
MW-2	02-01-90	Not sampled: well contained floating product				
MW-2	07-31-90	240000	14000	24000	3000	17000
MW-2	10-30-90	Not sampled: well contained floating product				
MW-2	01-30-91	Not sampled: well contained floating product				
MW-2	04-30-91	Not sampled: well contained floating product				
MW-2	08-06-91	Not sampled: well contained floating product				
MW-2	11-05-91	Not sampled: well contained floating product				
MW-2	03-10-92	220000	8200	13000	4500	22000
MW-2	06-30-92	130000	10000	16000	4700	24000
MW-2	09-09-92	Not sampled: well contained floating product				
MW-2	11-20-92	Not sampled: well contained floating product				
MW-2	02-12-93	Not sampled: well contained floating product				
MW-2	05-12-93	Not sampled: well contained floating product				
MW-2	08-18-93	Not sampled:				
MW-2	11-10-93	Not sampled: floating product entered well during purging				
MW-2	02-04-94	2100	110	5.6	26	110
MW-2	05-02-94	3400	130	21	73	180
MW-2	08-03-94	Not sampled: well was inaccessible due to a parked car				

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ppb	ppb	ppb	ppb	ppb
MW-3	04-24-89	560#	0.54	0.75	<0.5	<0.5
MW-3	10-12-89	450#	<0.5	<0.5	<0.5	<0.5
MW-3	02-01-90	360#	<0.3	<0.3	<0.3	0.85
MW-3	08-01-90	440#	<0.5	<0.5	<0.5	<0.5
MW-3	10-30-90	340#	<0.5	<0.5	<0.5	<0.5
MW-3	01-30-91	Not sampled: dry well				
MW-3	04-30-91	Not sampled: well was inaccessible due to construction				
MW-3	08-06-91	430#	<0.3	<0.3	<0.3	<0.3
MW-3	11-05-91	290#	<1.5	<1.5	<1.5	<1.5
MW-3	03-10-92	<360*	<0.5	<0.5	<0.5	<0.5
MW-3	06-30-92	<530*	<0.5	<0.5	<0.5	<0.5
MW-3	09-09-92	<290*	<0.5	<0.5	<0.5	<0.5
MW-3	11-20-92	<270*	<0.5	<0.5	<2.4**	<1.8**
MW-3	02-12-93	<500*	<0.5	<0.5	<0.5	<0.5
MW-3	05-12-93	<670*	<0.5	<0.5	<0.5	<0.5
MW-3	08-18-93	<590*	<0.5	<0.5	<0.5	<0.5
MW-3	11-10-93	<400*	<0.5	<0.5	<0.5	<0.9**
MW-3	02-04-94	<190*	<0.5	<0.5	<0.5	<0.5
MW-3	05-02-94	<480*	<0.5	<0.5	<0.5	<0.9**
MW-3	08-03-94	<250*	<0.5	<0.5	<0.5	<0.5
MW-4	04-24-89	2500#	270	1.4	<0.5	85
MW-4	10-13-89	760#	0.86	<0.5	1.2	<0.5
MW-4	02-01-90	680#	<0.3	<0.3	<0.3	1.6
MW-4	07-31-90	470#	<0.5	<0.5	<0.5	<0.5
MW-4	10-30-90	430#	<0.5	<0.5	<0.5	<0.5
MW-4	01-30-91	<50	<0.5	<0.5	1.2	<0.5
MW-4	04-30-91	600#	<0.3	0.3	<0.3	0.43
MW-4	08-06-91	520#	<0.3	<0.3	<0.3	<0.3
MW-4	11-05-91	900#	<3.0***	<3.0***	<3.0***	<3.0***
MW-4	03-10-92	<730*	<0.5	<0.5	<0.5	<0.5
MW-4	06-30-92	<670*	<0.5	<0.5	<2.3**	500
MW-4	09-09-92	<470*	<0.5	<0.5	<0.5	<0.5
MW-4	11-20-92	<680*	<0.5	<0.5	<6.3**	<3.2**
MW-4	02-12-93	<860*	<0.5	<0.5	<0.5	<0.5
MW-4	05-12-93	<670*	<0.5	<0.5	<1.4**	<1.3**
MW-4	08-18-93	<700*	<0.5	<0.5	<0.5	<0.5
MW-4	11-10-93	<460*	<0.5	<0.5	<0.5	<1.3**
MW-4	02-04-94	<480*	<0.5	<0.5	<0.5	1.4
MW-4	05-02-94	<490*	<0.5	<0.5	<0.5	<0.9**
MW-4	08-03-94	<400*	<0.5	<0.5	<0.5	<0.5

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

Well Designation	Water Sample Field Date	TPHG ppb	Benzene ppb	Toluene ppb	Ethyl-benzene ppb	Total Xylenes ppb
MW-5	04-24-89	130#	0.67	<0.5	<0.5	<0.5
MW-5	10-13-89	75#	<0.5	<0.5	<0.5	<0.5
MW-5	02-01-90	81#	0.94	0.88	<0.3	1.8
MW-5	07-31-90	110#	<0.5	<0.5	<0.5	<0.5
MW-5	10-30-90	<50	<0.5	<0.5	<0.5	<0.5
MW-5	01-30-91	<50	<0.5	<0.5	<0.5	<0.5
MW-5	04-30-91	120#	<0.3	<0.3	<0.3	<0.3
MW-5	08-06-91	<30	<0.3	<0.3	<0.3	<0.3
MW-5	11-05-91	77#	1	3.6	0.6	2.6
MW-5	03-10-92	<110*	<0.5	<0.5	<0.5	<0.6**
MW-5	06-30-92	<50	<0.5	<0.5	<0.5	<0.5
MW-5	09-09-92	<50	<0.5	<0.5	<0.5	<0.5
MW-5	11-24-92	<50	<0.5	<0.5	<0.5	<0.5
MW-5	02-12-93	<150*	<0.5	<0.5	<0.5	<0.5
MW-5	05-12-93	<50	<0.5	<0.5	<0.5	<0.5
MW-5	08-18-93	<50	<0.5	<0.5	<0.5	<0.5
MW-5	11-10-93	<50	<0.5	<0.5	<0.5	<1.4**
MW-5	02-04-94	<50	<0.5	<0.5	<0.5	<0.5
MW-5	05-02-94	<50	<0.5	<0.5	<0.5	<0.5
MW-5	08-03-94	<50	<0.5	<0.5	<0.5	<0.5
MW-6	06-30-92	<850*	<0.5	<0.5	<0.5	<0.5
MW-6	09-09-92	Not sampled: well was paved over				
MW-6	11-20-92	Not sampled: well was paved over				
MW-6	02-12-93	<1900*	<2.5***	<2.5***	<2.5***	<2.5***
MW-6	05-12-93	<1600*	<2.5***	<2.5***	<2.5***	<2.5***
MW-6	08-18-93	<1500*	<2.5***	<2.5***	<2.5***	<2.5***
MW-6	11-10-93	<1000*	<2.5***	<2.5***	<2.5***	<2.5***
MW-6	02-04-94	<830*	<2.5***	<2.5***	<2.5***	3.1
MW-6	05-02-94	<860*	<1***	<1***	<1***	1.3
MW-6	08-03-94	<660*	<1***	<1***	<1***	<1***

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ppb	ppb	ppb	ppb	ppb
MW-7	06-30-92	71000	5100	6600	2300	14000
MW-7	09-09-92	Not sampled: well contained floating product				
MW-7	11-20-92	Not sampled: well contained floating product				
MW-7	02-12-93	Not sampled: well contained floating product				
MW-7	05-12-93	Not sampled: well contained floating product				
MW-7	08-18-93	Not sampled: well contained floating product				
MW-7	11-10-93	Not sampled: floating product entered the well during purging				
MW-7	02-04-94	40000	900	980	1100	9700
MW-7	05-02-94	38000	640	600	930	7200
MW-7	08-03-94	47000	1000	1200	1500	10000
MW-8	09-09-92	<50	3.4	<0.5	<0.5	0.7
MW-8	11-24-92	<50	<0.5	<0.5	<0.5	<0.5
MW-8	02-12-93	<50	<0.5	<0.5	<0.5	<0.5
MW-8	05-12-93	<50	<0.5	<0.5	<0.5	<0.5
MW-8	08-18-93	<50	<0.5	<0.5	<0.5	<0.5
MW-8	11-10-93	<50	<0.5	<0.5	<0.5	1.1
MW-8	02-04-94	<50	<0.5	<0.5	<0.5	<0.5
MW-8	05-02-94	<50	<0.5	<0.5	<0.5	<0.5
MW-8	08-03-94	<50	<0.5	<0.5	<0.5	<0.5
RW-1	11-05-91	750#	4.8	3.7	<3.0	<3.0
RW-1	03-10-92	<140*	<0.5	<0.5	<0.5	<0.6**
RW-1	06-30-92	<400*	<0.5	<0.5	<0.5	<0.5
RW-1	09-09-92	<520*	<0.5	<0.5	<0.5	<0.5
RW-1	11-24-92	<650*	<0.5	<0.5	<8.6**	<7.2**
RW-1	02-12-93	<260*	<0.5	<0.5	<0.5	<0.5
RW-1	05-12-93	<240*	<0.5	<0.5	<0.5	<0.5
RW-1	08-18-93	<230*	<0.5	<0.5	<0.5	<0.5
RW-1	11-10-93	<380*	<0.5	<0.5	<0.5	<0.8**
RW-1	02-04-94	<540*	<0.5	<0.5	<0.5	<1.5**
RW-1	05-02-94	<50	<0.5	<0.5	<0.5	<0.5
RW-1	08-03-94	<140*	<0.5	<0.5	<0.5	<0.5

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ppb	ppb	ppb	ppb	ppb
WGR-3	05-02-94	<50	<0.5	<0.5	<0.5	<0.5
WGR-3	08-03-94	<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)
# = Based on new results, the chromatogram peaks previously interpreted to be TPHG and BTEX have been reinterpreted to be a single peak hydrocarbon (possibly PCE)
* = Raised method reporting limit due to matrix interference. The sample contains a single non-fuel component eluting in the gasoline range and quantitated as gasoline (possibly PCE). The chromatogram does not match the typical gasoline fingerprint.
** = Raised method reporting limit due to matrix interference.
*** = Raised method reporting limit due to high analyte concentration requiring sample dilution

Table 4
Historical Groundwater Analytical Data
(TRPH, TPHD, and Metals)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

Well Designation	Water Sample Field Date	TOG or TRPH	TPHD	Cadmium by EPA 6010	Chromium by EPA 6010	Lead by EPA 7421	Nickel by EPA 6010	Zinc by EPA 6010
		ppb	ppb	ppb	ppb	ppb	ppb	ppb
MW-4	04-24-89	NA	NA	NA	NA	NA	NA	NA
MW-4	10-13-89	NA	NA	NA	NA	NA	NA	NA
MW-4	02-01-90	NA	NA	NA	NA	NA	NA	NA
MW-4	07-31-90	<500	240	NA	NA	NA	NA	NA
MW-4	10-30-90	<500	<100	NA	NA	NA	NA	NA
MW-4	01-30-91	<500	<100	NA	NA	NA	NA	NA
MW-4	04-30-91	NA	NA	NA	NA	NA	NA	NA
MW-4	08-06-91	NA	NA	<10	65	6.7	140	96
MW-4	11-05-91	NA	NA	NA	NA	NA	NA	NA
MW-4	03-10-92	<2500	NA	NA	NA	NA	NA	NA
MW-4	06-30-92	500	NA	NA	NA	NA	NA	NA
MW-4	09-09-92	3600	NA	NA	NA	NA	NA	NA
MW-4	11-20-92	800	NA	NA	NA	NA	NA	NA
MW-4	02-12-93	25000	NA	NA	NA	NA	NA	NA
MW-4	05-12-93	120000	NA	NA	NA	NA	NA	NA
MW-4	08-18-93	<500	NA	NA	NA	NA	NA	NA
MW-4	11-10-93	<500	NA	NA	NA	NA	NA	NA
MW-4	02-04-94	<500	NA	NA	NA	NA	NA	NA
MW-4	05-02-94	5900	NA	NA	NA	NA	NA	NA
MW-4	08-03-94	<500	NA	NA	NA	NA	NA	NA

TOG = Total oil and grease by standard methods 5520 C&F
TRPH = Total recoverable petroleum hydrocarbons by EPA Method 418.1
TPHD = Total petroleum hydrocarbons as diesel by EPA Method 3510/California DHS LUFT Method
ppb = Parts per billion or micrograms per liter (µg/l)
NA = Not analyzed

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE	TCE	1,2-DCE	cis-1,2-DCE	Freon 12	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
MW-1	09-03-91	4.5	ND	ND	ND		ND	ND	ND	ND
MW-1	11-06-91	<2.0	<2.0	<2.0	<2.0		ND	ND	ND	ND
MW-1	03-10-92	8.2	ND	ND	ND		ND	ND	ND	ND
MW-1	06-30-92	15	ND	ND	ND		ND	ND	ND	ND
MW-1	09-09-92	6	ND	ND	ND		ND	ND	ND	ND
MW-1	11-20-92	2	ND	ND	ND		ND	ND	ND	ND
MW-1	02-12-93	92	ND	ND	ND		ND	ND	ND	ND
MW-1	05-12-93	280	ND	ND	ND		ND	ND	ND	ND
MW-1	08-18-93	120	ND	ND	ND		ND	ND	ND	ND
MW-1	11-10-93	46	ND	ND	ND		ND	ND	ND	ND
MW-1	02-04-94	22	<1	<1	<1		<1	<1	<1	<5
MW-1	05-02-94	35	<1	<1	<1		<1	<1	<1	<5
MW-1	08-03-94	14	<1	<1	<1		<1	<1	<1	<5

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

Well Desig-nation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE	TCE	1,2-DCE	cis-1,2-DCE	Freon 12	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
MW-2	09-03-91	Not sampled: well contained floating product								
MW-2	11-06-91	Not sampled: well contained floating product								
MW-2	03-10-92	0.9	ND	5.4	ND		ND	ND	ND	ND
MW-2	06-30-92	<2000	<2000	<2000	<2000		9300	18000	4200	27000
MW-2	09-09-92	Not sampled: well contained floating product								
MW-2	11-20-92	Not sampled: well contained floating product								
MW-2	02-12-93	Not sampled: well contained floating product								
MW-2	05-12-93	Not sampled: well contained floating product								
MW-2	08-18-93	Not sampled:								
MW-2	11-10-93	Not sampled: floating product entered the well during purging								
MW-2	02-04-94	<1	<1	<1	<1		170	9	36	160
MW-2	05-02-94	<1	<1	<1	<1		140	21	79	190
MW-2	08-03-94	Not sampled: well was inaccessible due to a parked car								

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE	TCE	1,2-DCE	cis-1,2-DCE	Freon 12	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
MW-3	09-03-91	1600	ND	ND	ND		ND	ND	ND	ND
MW-3	11-06-91	400	ND	ND	ND		ND	ND	ND	ND
MW-3	03-10-92	980	5.6	ND	1	3.4	ND	ND	ND	ND
MW-3	06-30-92	1500	ND	ND	ND		ND	ND	ND	ND
MW-3	09-09-92	800	ND	ND	ND		ND	ND	ND	ND
MW-3	11-20-92	690	ND	ND	ND		ND	ND	ND	ND
MW-3	02-12-93	1200	ND	ND	ND		ND	ND	ND	ND
MW-3	05-12-93	1600	ND	ND	ND		ND	ND	ND	ND
MW-3	08-18-93	1300	ND	ND	ND		ND	ND	ND	ND
MW-3	11-10-93	1300	ND	ND	ND		ND	ND	ND	ND
MW-3	02-04-94	91	<5	<5	<5		<5	<5	<5	<25
MW-3	05-02-94	1600	<20	<20	<20		<20	<20	<20	<100
MW-3	08-03-94	680	<20	<20	<20		<20	<20	<20	<100

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE	TCE	1,2-DCE	cis-1,2-DCE	Freon 12	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
MW-4	07-31-90	1600	7.5	0.7	ND		ND	ND	ND	ND
MW-4	10-30-90	3600	8.1	0.7	ND		ND	ND	ND	ND
MW-4	01-30-91	4900	12	ND	ND		ND	ND	ND	ND
MW-4	04-30-91	2200	ND	ND	ND		ND	ND	ND	ND
MW-4	08-06-91	1700	ND	ND	ND		ND	ND	ND	ND
MW-4	09-03-91	2000	ND	ND	ND		ND	ND	ND	ND
MW-4	11-06-91	1000	6.3	ND	ND		ND	ND	ND	ND
MW-4	03-10-92	2300	13	ND	4		ND	ND	ND	ND
MW-4	06-30-92	1800	ND	ND	ND		ND	ND	ND	ND
MW-4	09-09-92	1300	ND	ND	ND		ND	ND	ND	ND
MW-4	11-20-92	1700	ND	ND	ND		ND	ND	ND	ND
MW-4	02-12-93	1800	ND	ND	ND		ND	ND	ND	ND
MW-4	05-12-93	1500	ND	ND	ND		ND	ND	ND	ND
MW-4	08-18-93	1800	ND	ND	ND		ND	ND	ND	ND
MW-4	11-10-93	1800	ND	ND	ND		ND	ND	ND	ND
MW-4	02-04-94	1900	<20	<20	<20		<20	<20	<20	<100
MW-4	05-02-94	1700	<20	<20	<20		<20	<20	<20	<100
MW-4	08-03-94	1200	<20	<20	<20		<20	<20	<20	<100

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE	TCE	1,2-DCE	cis-1,2-DCE	Freon 12	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
MW-5	08-06-91	7.3	ND	ND	ND		ND	ND	ND	ND
MW-5	09-03-91	25	ND	ND	ND		ND	ND	ND	ND
MW-5	11-06-91	12	ND	ND	ND		ND	ND	ND	ND
MW-5	03-10-92	300	1.3	ND	ND		ND	ND	ND	ND
MW-5	06-30-92	30	ND	ND	ND		ND	ND	ND	ND
MW-5	09-09-92	120	ND	ND	ND		ND	ND	ND	ND
MW-5	11-24-92	93	ND	ND	ND		ND	ND	ND	ND
MW-5	02-12-93	210	ND	ND	ND		ND	ND	ND	ND
MW-5	05-12-93	50	ND	ND	ND		ND	ND	ND	ND
MW-5	08-18-93	80	ND	ND	ND		ND	ND	ND	ND
MW-5	11-10-93	42	ND	ND	ND		ND	ND	ND	ND
MW-5	02-04-94	39	<1	<1	<1		<1	<1	<1	<5
MW-5	05-02-94	35	<1	<1	<1		<1	<1	<1	<5
MW-5	08-03-94	25	<1	<1	<1		<1	<1	<1	<5

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE	TCE	1,2-DCE	cis-1,2-DCE	Freon 12	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
MW-6	06-30-92	2400	ND	ND	ND		ND	ND	ND	ND
MW-6	09-09-92	Not sampled: well was paved over								
MW-6	11-20-92	Not sampled: well was paved over								
MW-6	02-12-93	4200	ND	ND	ND		ND	ND	ND	ND
MW-6	05-12-93	3500	ND	ND	ND		ND	ND	ND	ND
MW-6	08-18-93	3000	ND	ND	ND		ND	ND	ND	ND
MW-6	11-10-93	3900	ND	ND	ND		ND	ND	ND	ND
MW-6	02-04-94	2900	<50	<50	<50		<50	<50	<50	<250
MW-6	05-02-94	2000	<50	<50	<50		<50	<50	<50	<250
MW-6	08-03-94	1400	<50	<50	<50		<50	<50	<50	<250
MW-7	06-30-92	<1000	<1000	<1000	<1000		5100	6800	2300	16000
MW-7	09-09-92	Not sampled: well contained floating product								
MW-7	11-20-92	Not sampled: well contained floating product								
MW-7	02-12-93	Not sampled: well contained floating product								
MW-7	05-12-93	Not sampled: well contained floating product								
MW-7	08-18-93	Not sampled: well contained floating product								
MW-7	11-10-93	Not sampled: floating product entered the well during purging								
MW-7	02-04-94	<50	<50	<50	<50		940	950	1100	9100
MW-7	05-02-94	<50	<50	<50	<50		440	400	660	5200
MW-7	08-03-94	<50	<50	<50	<50		640	770	960	6200

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

Well Designation	Water Sample Field Date	Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240					BTEX by EPA Method 624/8240			
		PCE	TCE	1,2-DCE	cis-1,2-DCE	Freon 12	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
MW-8	09-09-92	37	ND	ND	ND		4	ND	ND	ND
MW-8	11-24-92	2	ND	ND	ND		ND	ND	ND	ND
MW-8	02-12-93	<1	<1	<1	<1		ND	ND	ND	ND
MW-8	05-12-93	<1	<1	<1	<1		ND	ND	ND	ND
MW-8	08-18-93	<1	<1	<1	<1		ND	ND	ND	ND
MW-8	11-10-93	<1	<1	<1	<1		ND	ND	ND	ND
MW-8	02-04-94	<1	<1	<1	<1		<1	<1	<1	<5
MW-8	05-02-94	<1	<1	<1	<1		<1	<1	<1	<5
MW-8	08-03-94	<1	<1	<1	<1		<1	<1	<1	<5
RW-1	11-06-91	980	ND	ND	ND		ND	ND	ND	ND
RW-1	03-10-92	400	1.7	ND	ND		ND	ND	ND	ND
RW-1	06-30-92	1100	ND	ND	ND		ND	ND	ND	ND
RW-1	09-09-92	1500	ND	ND	ND		ND	ND	ND	ND
RW-1	11-24-92	1500	ND	ND	ND		ND	ND	ND	ND
RW-1	02-12-93	620	ND	ND	ND		ND	ND	ND	ND
RW-1	05-12-93	500	ND	ND	ND		ND	ND	ND	ND
RW-1	08-18-93	470	ND	ND	ND		ND	ND	ND	ND
RW-1	11-10-93	1500	ND	ND	ND		ND	ND	ND	ND
RW-1	02-04-94	2200	<20	<20	<20		<20	<20	<20	<100
RW-1	05-02-94	45	<1	<1	<1		<1	<1	<1	<5
RW-1	08-03-94	350	4	<1	<1		<1	<1	<1	<5

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and *10700* MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

Well Designation	Water Sample Field Date	**Halogenated Volatile Organic Compounds by EPA Method 601/8010 or 624/8240**					**BTEX by EPA Method 624/8240**			
		PCE	TCE	1,2-DCE	cis-1,2-DCE	Freon 12	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb	ppb
WGR-3	05-02-94	<1	<1	<1	<1		<1	<1	<1	<5
WGR-3	08-03-94	<1	<1	<1	<1		<1	<1	<1	<5

PCE = Tetrachloroethene
TCE = Trichloroethene
1,2-DCE = 1,2-Dichloroethene
cis-*1,2-DCE* = cis-*1,2-Dichloroethene*
ppb = Parts per billion or micrograms per liter (µg/l)
ND = Not detected at or above the method detection limit

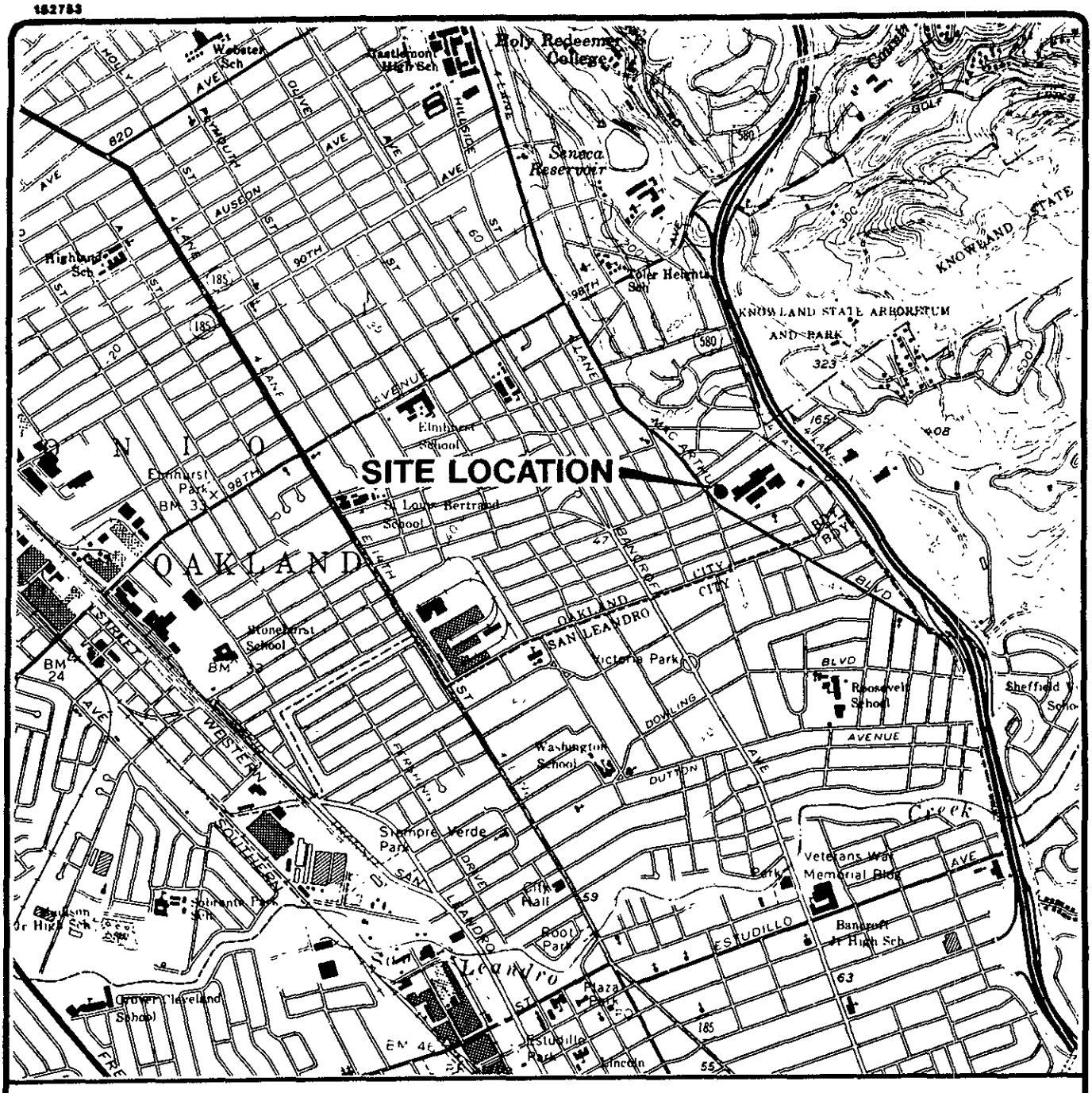
Table 6
Approximate Cumulative Floating Product Recovered

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 01-17-95
Project Number: 0805-120.02

Well Designation	Date	Floating Product Recovered gallons
MW-2 and MW-7	1991	18.15
MW-2 and MW-7	1992	0.39
MW-2 and MW-7	1993	0.00
MW-2 and MW-7	1994	0.00
	1991 to 1994 Total:	18.54

182783



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

- N -

Scale : 0 2000 4000 Feet

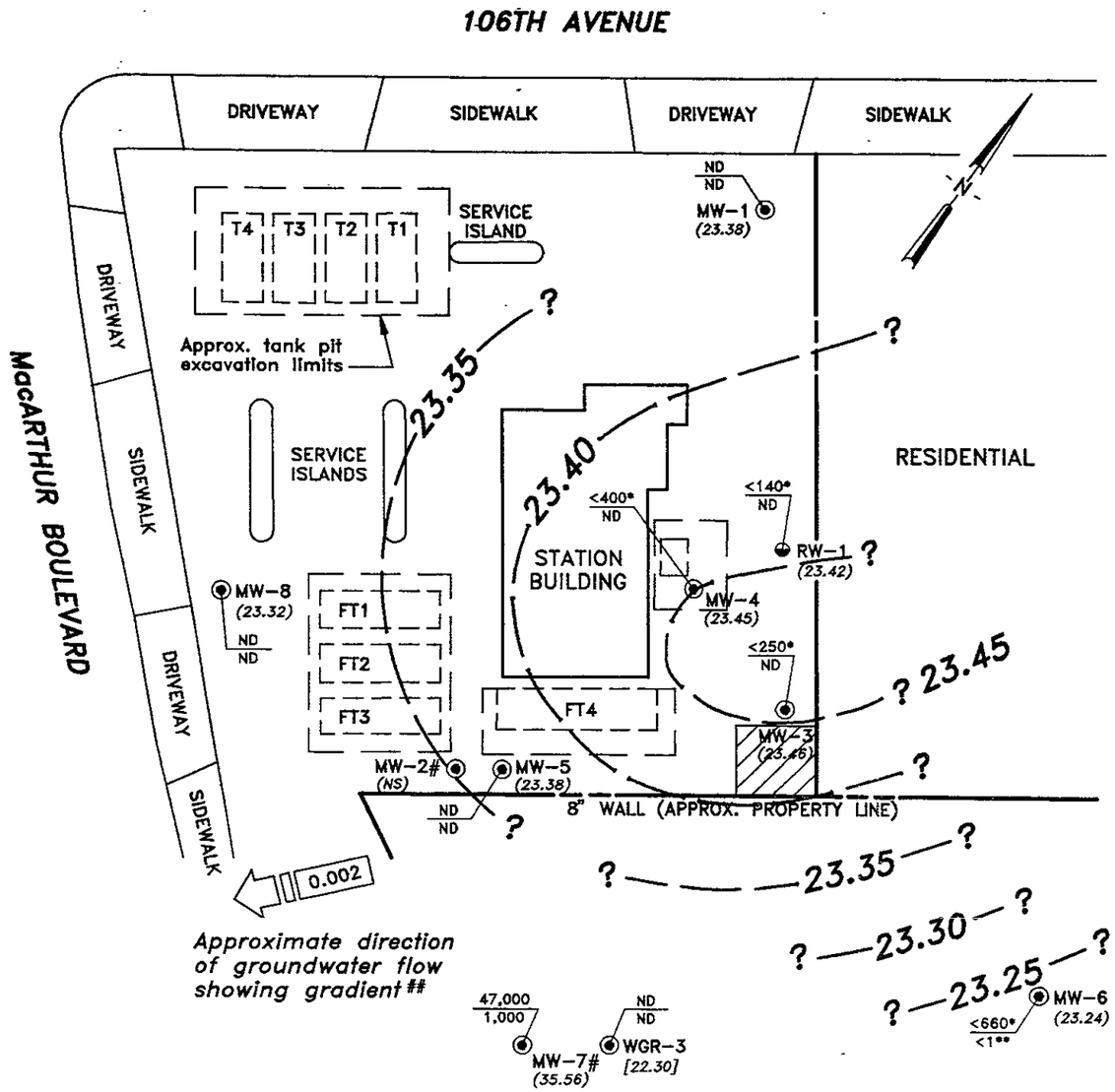
EMCON Associates

10600 AND 10700 MACARTHUR BLVD.
QUARTERLY GROUNDWATER MONITORING
OAKLAND, CALIFORINA

SITE LOCATION

FIGURE
1

PROJECT NO.
805-120.02



EXPLANATION

- ◉ Groundwater monitoring well
- ◒ Recovery well
- (23.38) Groundwater elevation (Ft.–MSL); measured 8/3/94
- [22.30] Depth to water measured on 8/3/94 (top of casing elevation not available)
- ? — 23.30 — Groundwater elevation contour (Ft.–MSL)
- 250 / ND — TPHG concentration in groundwater (ppb); sampled 8/3/94; Benzene concentration in groundwater (ppb); sampled 8/3/94
- NS — Not sampled; well was inaccessible due to a parked car
- # — Well screened in shallow water–bearing zone (not used in contouring)
- ## — Approximate groundwater flow direction and gradient calculated using the following wells: MW–4, MW–5, and MW–8
- * — Raised method reporting limit due to matrix interference. Sample contains a single non–fuel component eluting in the gasoline range and quantitated as gasoline (possibly PCE). The chromatogram does not match the typical gasoline fingerprint.
- ** — Raised method reporting limit due to high analyte concentration requiring sample dilution.

EMCON Associates

SCALE: 0 30 60 FEET

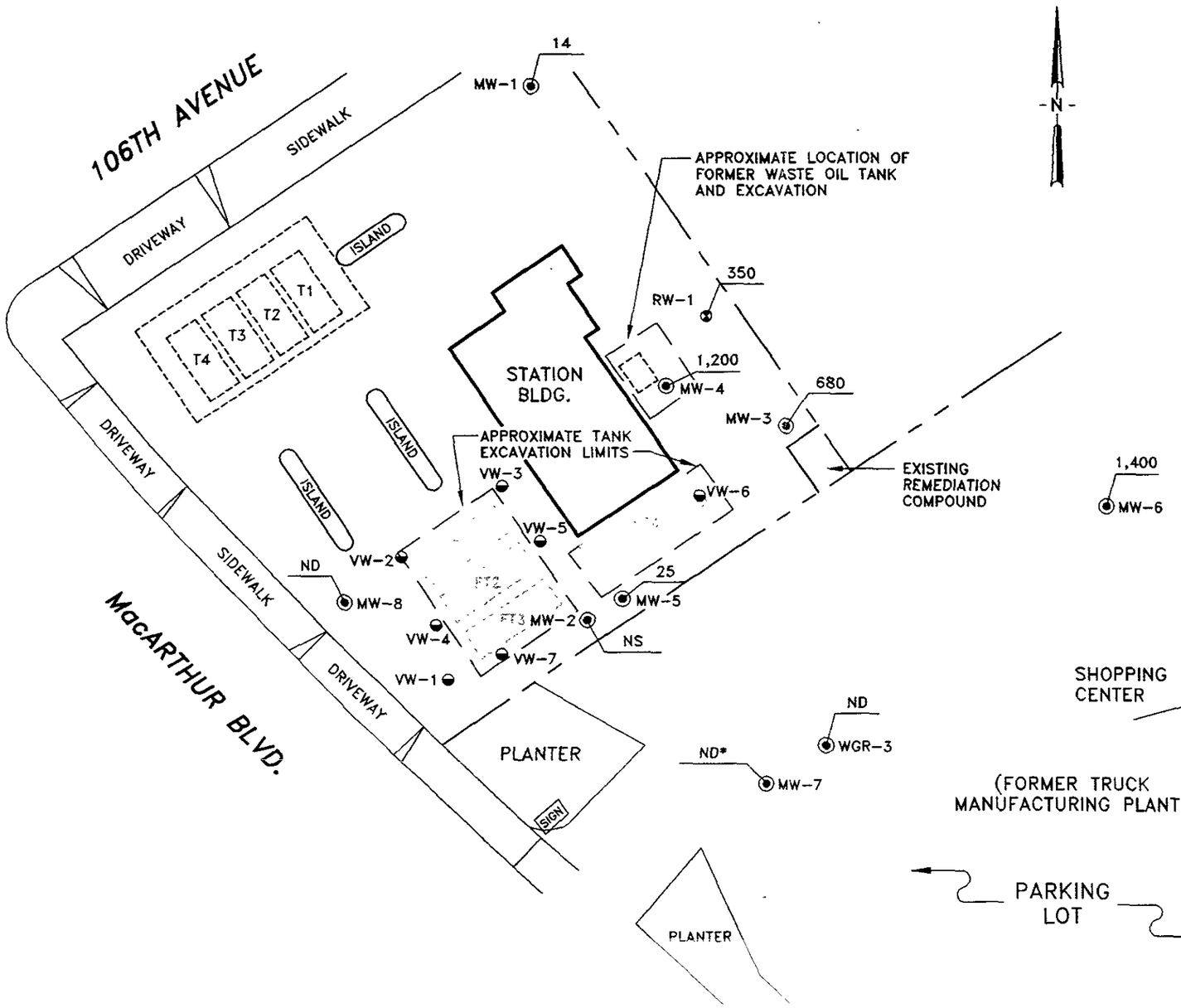
10600 AND 10700 MACARTHUR BLVD.
QUARTERLY GROUNDWATER MONITORING
OAKLAND, CALIFORNIA

GROUNDWATER DATA
THIRD QUARTER 1994

FIGURE NO. 2

PROJECT NO. 805–120.02

G\805-120\G00 REV 0 02/24/95 14:40:41 KAJ



EXPLANATION

- ◉ Groundwater monitoring well
- ◉ Recovery well
- ◒ Vapor extraction well
- 680 PCE concentration (ppb); sampled 8/3/94
- ND Not detected at or below method reporting limits (refer to CARs)
- NS Not sampled; well was inaccessible due to a parked car
- Existing underground storage tank
- Former underground storage tank

* Well screened in shallow water-bearing zone.

Base map modified from RESNA, 1993

EMCON Associates

SCALE: 0 30 60 FEET

10600 AND 10700 MACARTHUR BLVD.
QUARTERLY GROUNDWATER MONITORING
OAKLAND, CALIFORNIA

TETRACHLOROETHENE (PCE) CONCENTRATIONS IN GROUNDWATER
THIRD QUARTER 1994

FIGURE NO
3
PROJECT NO
805-120.02

G:\805-120\PCE REV 0 01/17/95 14:23:33 klt DJ

APPENDIX A

FIELD DATA REPORT, INTEGRATED WASTESTREAM MANAGEMENT, AUGUST 24, 1994

I NTEGRATED
W ASTESTREAM
M ANAGEMENT, INC.

August 24, 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. A-276 in Oakland, California. Integrated Wastestream Management measured the depth to water and collected samples from wells at this site on August 3, 1994.

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

Please call us if you have any questions.

Sincerely,
Integrated Wastestream Management

Tom DeLon
Project Manager

Walter H. Howe
Registered Geologist

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

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

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

A0276Q3.XLS

Summary of Ground Water Sample Analyses for ARCO Facility A-276, Oakland, California

WELL NUMBER	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	RW-1	WGR-3
DATE SAMPLED	8/3/94	8/3/94	8/3/94	8/3/94	8/3/94	8/3/94	8/3/94	8/3/94	8/3/94	8/3/94
DEPTH TO WATER	32.54	*	33.09	32.53	32.05	37.97	22.66	30.33	32.90	22.30
SHEEN	NONE	*	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE
PRODUCT THICKNESS	NA	*	NA	NA	NA	NA	NA	NA	NA	NA
TPHg	ND	*	250	400	ND	660	47,000	ND	140	ND
BTEX										
BENZENE	ND	*	ND	ND	ND	<1	1,000	ND	ND	ND
TOLUENE	ND	*	ND	ND	ND	<1	1,200	ND	ND	ND
ETHLYBENZENE	ND	*	ND	ND	ND	<1	1,500	ND	ND	ND
XYLENES	ND	*	ND	ND	ND	<1	10,000	ND	ND	ND
EPA 481-1										
PETROLEUM HYDROCARBONS	NA	*	NA	ND	NA	NA	NA	NA	NA	NA
EPA 8240										
BENZENE	ND	*	<20	<20	ND	<50	640	ND	ND	ND
TOLUENE	ND	*	<20	<20	ND	<50	770	ND	ND	ND
ETHYLBENZENE	ND	*	<20	<20	ND	<50	960	ND	ND	ND
TOTAL XYLENES	ND	*	<100	<100	ND	<250	6,200	ND	ND	ND
PCE	14	*	680	1,200	25	1,400	<50	ND	ND	ND
TCE	ND	*	<20	<20	ND	<50	<50	ND	4	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

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

FIELD REPORT

Depth To Water / Floating Product Survey

Site Arrival Time: 700
Site Departure Time: 1430
Weather Conditions: Sunny clear

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

Project No.: ______ **Location:** 10600 McArthur blvd. OAK **Date:** August 3, 1994

Client / Station#: Arco 276 **Field Technician:** Vince/Cisco **Day of Week:** Wednesday

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
3	MW-1	OK	Yes	OK	OK	OK	39.03	32.54+	32.54	N/A	N/A	N	2"	Hole in Hex
9	MW-2	~	—	N/A	~	~	N/A	N/A	N/A	N/A	N/A	N	Abandoned CAR over well	
6	MW-3	OK	Yes	OK	OK	OK	39.00	33.09	33.09	N/A	N/A	N	2"	9/16
7	MW-4	OK	Yes	OK	OK	OK	48.78	32.53+	32.53+	N/A	N/A	N	2"	9/16
5	MW-5	OK	Yes	OK	OK	OK	47.54	32.05	32.05	N/A	N/A	N	4"	Hole
8	MW-6	OK	Yes	OK	OK	OK	53.64	37.97	37.97	N/A	N/A	N	2"	15/16
10	MW-7	OK	Yes	OK	OK	OK	37.40	22.66+	22.66+	N/A	N/A	N	2"	15/16
1	MW-8	OK	Yes	OK	None	None	49.00	30.33+	30.33+	N/A	N/A	N	4"	ARCO [illegible]
4	RW-1	OK	Yes	OK	None	None	49.26	32.90	32.90	N/A	N/A	N	6"	ARCO [illegible]
2	WGR-3	OK	Yes	OK	OK	OK	27.50	22.30	22.30	N/A	N/A	N	4"	8" lid

PAGE 2 OF 4. DATE: 8-3 94 CLIENT/STATION #: Arco 276 ADDRESS: 10600 MacArthur Blvd. OAK.

WELL ID: MW-1 TD 39.03. DTW 32.54 x Gal. 0.17 (Linear Ft.) x Casing 3 (Volume) = Calculated 3.30 (Purge)

DATE PURGED: 8-3-94 START (2400 HR): 1000 END (2400 HR) 1009
DATE SAMPLED: 8-3-94 TIME (2400 HR): 1012 DTW: 33.1

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1003	1	7.26	1.08	72.1	clear
1006	2	7.24	1.11	71.5	clear
1009	3	7.23	1.12	70.1	clear

Total purge: 3
PURGING EQUIP.: Centrifugal Pump [Bailer Disp.] SAMPLING EQUIP: [Bailer Disp.]
REMARKS:

WELL ID: MW-8 TD 49.0 - DTW 30.33 x Gal. 0.66 (Linear Ft.) x Casing 3 (Volume) = Calculated 36.96 (Purge)

DATE PURGED: 8-3-94 START (2400 HR): 1019 END (2400 HR) 1036
DATE SAMPLED: 8-3-94 TIME (2400 HR): 1040 DTW: 32.6

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1022	2	7.29	0.39	70.8	clear
1027	15	7.37	0.41	70.2	clear
1031	26	7.22	0.40	69.5	clear
1036	36	7.21	0.38	69.3	clear

Total purge: 36
PURGING EQUIP.: [Centrifugal Pump] Bailer Disp. SAMPLING EQUIP: [Bailer Disp.]
REMARKS:

WELL ID: MGR-3 TD 27.50. DTW 22.30 x Gal. 0.66 (Linear Ft.) x Casing 3 (Volume) = Calculated 10.29 (Purge)

DATE PURGED: 8-3-94 START (2400 HR): 1051 END (2400 HR) 1056
DATE SAMPLED: 8-3-94 TIME (2400 HR): 1059 DTW: 25.1

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1052	1	7.32	0.31	71.8	clear
1053	5	7.29	0.29	71.1	clear
1054	8	7.39	0.30	70.8	clear
1056	10	7.40	0.29	70.4	clear

Total purge: 10
PURGING EQUIP.: [Centrifugal Pump] Bailer Disp. SAMPLING EQUIP: [Bailer Disp.]
REMARKS:

WELL ID: RW-1 TD 49.26. DTW 32.90 x Gal. 1.5 (Linear Ft.) x Casing 2 (Volume) = Calculated 49.08 (Purge)

DATE PURGED: 8-3-94 START (2400 HR): 1129 END (2400 HR) 1155
DATE SAMPLED: 8-3-94 TIME (2400 HR): 1159 DTW: 33.9

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1129	14	7.26	0.69	71.9	clear
1137	28	7.12	0.63	70.9	clear
1144	38	6.97	0.59	69.9	clear
1155	49	6.96	0.58	69.6	clear

Total purge: 49
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:

 DATE: 8-3-94 CLIENT/STATION #: Arco 276 ADDRESS: 10600 MacArthur Blvd. Oak

WELL ID: MW-5 TD 47.54 - DTW 32.05 X 0.66 Gal. Linear Ft. X 3 Casing Volume = 30.67 Calculated Purge

DATE PURGED: 8-3-94 START (2400 HR): 1250 END (2400 HR) 1312

DATE SAMPLED: 8-3-94 TIME (2400 HR): 1329 DTW: 35

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1251	1	7.24	0.27	71.5	clear
1256	12	6.73	0.30	70.5	clear
1305	21	6.75	0.29	70.1	clear
1312	30	6.76	0.29	69.7	clear

Total purge: 30

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

REMARKS:

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

DATE PURGED: START (2400 HR): END (2400 HR)

DATE SAMPLED: TIME (2400 HR): DTW:

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

Total purge:

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

REMARKS:

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

DATE PURGED: START (2400 HR): END (2400 HR)

DATE SAMPLED: TIME (2400 HR): DTW:

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

Total purge:

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

REMARKS:

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: [signature]

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 1 OF 1 DATE: 8-3-94 CLIENT/STATION #: Arco 276 ADDRESS: 10600 MacArthur blvd. Oak.

WELL ID: MW-6 TD 53.64 DTW 37.97 X 0.17 (Gal. / Linear Ft.) X 3 (Casing Volume) = 7.99 (Calculated Purge)

DATE PURGED: 8-3-94 START (2400 HR): 1030 END (2400 HR) 1055
DATE SAMPLED: 8-3-94 TIME (2400 HR): 1100 DTW: 43.6

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1033	1	7.26	0.85	70.8	cloudy
1042	4	7.27	0.83	68.4	cloudy
1055	8	7.28	0.80	67.7	cloudy
Total purge:	8				

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

WELL ID: MW-7 TD 37.40 DTW 22.66 X 0.17 (Gal. / Linear Ft.) X 3 (Casing Volume) = 7.51 (Calculated Purge)

DATE PURGED: 8-3-94 START (2400 HR): 1105 END (2400 HR) 1108
DATE SAMPLED: 8-3-94 TIME (2400 HR): 1111 DTW: 24.9

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1106	1	7.10	0.39	72.5	clear
1106	4	7.16	0.38	71.3	clear
1108	8	7.18	0.38	70.8	clear
Total purge:	8				

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

WELL ID: MW-3 TD 39.0 - DTW 33.09 X 0.17 (Gal. / Linear Ft.) X 3 (Casing Volume) = 3.01 (Calculated Purge)

DATE PURGED: 8-3-94 START (2400 HR): 1130 END (2400 HR) 1136
DATE SAMPLED: 8-3-94 TIME (2400 HR): 1140 DTW: 33.5

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1132	1	7.82	0.55	74.4	cloudy
1134	2	7.80	0.54	69.7	cloudy
1136	3	7.79	0.53	69.5	cloudy
Total purge:	3				

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

WELL ID: MW-4 TD 48.78 - DTW 32.53 X 0.17 (Gal. / Linear Ft.) X 3 (Casing Volume) = 8.28 (Calculated Purge)

DATE PURGED: 8-3-94 START (2400 HR): 1150 END (2400 HR) 1200
DATE SAMPLED: 8-3-94 TIME (2400 HR): 1205 DTW: 43.8

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1152	1	7.39	0.53	71.2	cloudy
1200	5	7.38	0.52	70.4	cloudy
Total purge:	5				

PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Well bailed dry at 5 gallons.

PRINT NAME: Francisco Abungan SIGNATURE: Francisco Abungan

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, THIRD QUARTER 1994

Columbia Analytical Services INC.

August 17, 1994

Service Request No. S940868

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

Re: **ARCO Facility No. 276**

Dear Ms. Austin/Mr. DeLon:

Attached are the results of the water samples submitted to our lab on August 5, 1994. For your reference, these analyses have been assigned our service request number S940868.

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

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:**	S940868
Project:	ARCO Facility No. 276	**Date Collected:**	8/3/94
Sample Matrix:	Water	**Date Received:**	8/5/94
		Date Extracted:	8/11/94
		Date Analyzed:	8/12/94

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

Sample Name	Lab Code	MRL	Result
MW-4 (43.8)	S940868-004	0.5	ND
Method Blank	S940811-WB	0.5	ND

Approved By: _____ Date: August 17, 1994

1AMRL/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	IWM	**Service Request:**	S940868
Project:	ARCO Facility No. 276	**Date Collected:**	8/3/94
Sample Matrix:	Water	**Date Received:**	8/5/94
		Date Extracted:	NA
		Date Analyzed:	8/10/94

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 (33.1)	S940868-002	ND	ND	ND	ND	ND
MW-3 (33.5)	S940868-003	<250 *	ND	ND	ND	ND
MW-4 (43.8)	S940868-004	<400 *	ND	ND	ND	ND
MW-5 (35)	S940868-005	ND	ND	ND	ND	ND
MW-6 (43.6)	S940868-006	<660 *	<1 **	<1 **	<1 **	<1 **
MW-7 (24.9)	S940868-007	47,000	1,000	1,200	1,500	10,000
MW-8 (32.6)	S940868-008	ND	ND	ND	ND	ND
RW-1 (33.9)	S940868-009	<140 *	ND	ND	ND	ND
WGR-3 (25.1)	S940868-010	ND	ND	ND	ND	ND
Method Blank	S940810-WB	ND	ND	ND	ND	ND

* Raised MRL due to matrix interference. Sample contains a single non-fuel component eluting in the gasoline range, quantitated as gasoline. The chromatogram does not match the typical gasoline fingerprint.

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

Approved By: Carol J Klein Date: August 17, 1994

5ABTXGAS/061694

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

Client: IWM
Project: ARCO Facility No. 276
Sample Matrix: Water

Service Request: S940868
Date Collected: 8/3/94
Date Received: 8/5/94
Date Extracted: NA

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

	Sample Name:	MW-1 (33.1)	MW-3 (33.5) *	MW-4 (43.8) *
	Lab Code:	S940868-002	S940868-003	S940868-004
	Date Analyzed:	8/9/94	8/9/94	8/9/94
Analyte	**MRL**			
Chloromethane	10	ND	<200	<200
Vinyl Chloride	10	ND	<200	<200
Bromomethane	10	ND	<200	<200
Chloroethane	10	ND	<200	<200
Trichlorofluoromethane (CFC 11)	1	ND	<20	<20
Trichlorotrifluoroethane (CFC 113)	10	ND	<200	<200
1,1-Dichloroethene	1	ND	<20	<20
Acetone	20	ND	<400	<400
Carbon Disulfide	1	ND	<20	<20
Methylene Chloride	10	ND	<200	<200
trans-1,2-Dichloroethene	1	ND	<20	<20
cis-1,2-Dichloroethene	1	ND	<20	<20
2-Butanone (MEK)	10	ND	<200	<200
1,1-Dichloroethane	1	ND	<20	<20
Chloroform	1	ND	<20	<20
1,1,1-Trichloroethane (TCA)	1	ND	<20	<20
Carbon Tetrachloride	1	ND	<20	<20
Benzene	1	ND	<20	<20
1,2-Dichloroethane	1	ND	<20	<20
Vinyl Acetate	10	ND	<200	<200
Trichloroethene (TCE)	1	ND	<20	<20
1,2-Dichloropropane	1	ND	<20	<20
Bromodichloromethane	1	ND	<20	<20
2-Chloroethyl Vinyl Ether	10	ND	<200	<200
trans-1,3-Dichloropropene	1	ND	<20	<20
4-Methyl-2-pentanone (MIBK)	10	ND	<200	<200
2-Hexanone	10	ND	<200	<200
Toluene	1	ND	<20	<20
cis-1,3-Dichloropropene	1	ND	<20	<20
1,1,2-Trichloroethane	1	ND	<20	<20
Tetrachloroethene (PCE)	1	14	680	1,200
Dibromochloromethane	1	ND	<20	<20
Chlorobenzene	1	ND	<20	<20
Ethylbenzene	1	ND	<20	<20
Styrene	1	ND	<20	<20
Total Xylenes	5	ND	<100	<100
Bromoform	1	ND	<20	<20
1,1,2,2-Tetrachloroethane	1	ND	<20	<20
1,3-Dichlorobenzene	1	ND	<20	<20
1,4-Dichlorobenzene	1	ND	<20	<20
1,2-Dichlorobenzene	1	ND	<20	<20

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

Approved By: Kevin A Murphy Date: August 17, 1994

3S44/060194

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

Client: IWM
Project: ARCO Facility No. 276
Sample Matrix: Water

Service Request: S940868
Date Collected: 8/3/94
Date Received: 8/5/94
Date Extracted: NA

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

	Sample Name:	MW-5 (35)	MW-6 (43.6) *	MW-7 (24.9) *
	Lab Code:	S940868-005	S940868-006	S940868-007
	Date Analyzed:	8/9/94	8/10/94	8/9/94
Analyte	**MRL**			
Chloromethane	10	ND	<500	<500
Vinyl Chloride	10	ND	<500	<500
Bromomethane	10	ND	<500	<500
Chloroethane	10	ND	<500	<500
Trichlorofluoromethane (CFC 11)	1	ND	<50	<50
Trichlorotrifluoroethane (CFC 113)	10	ND	<500	<500
1,1-Dichloroethene	1	ND	<50	<50
Acetone	20	ND	<1,000	<1,000
Carbon Disulfide	1	ND	<50	<50
Methylene Chloride	10	ND	<500	<500
trans-1,2-Dichloroethene	1	ND	<50	<50
cis-1,2-Dichloroethene	1	ND	<50	<50
2-Butanone (MEK)	10	ND	<500	<500
1,1-Dichloroethane	1	ND	<50	<50
Chloroform	1	ND	<50	<50
1,1,1-Trichloroethane (TCA)	1	ND	<50	<50
Carbon Tetrachloride	1	ND	<50	<50
Benzene	1	ND	<50	640
1,2-Dichloroethane	1	ND	<50	<50
Vinyl Acetate	10	ND	<500	<500
Trichloroethene (TCE)	1	ND	<50	<50
1,2-Dichloropropane	1	ND	<50	<50
Bromodichloromethane	1	ND	<50	<50
2-Chloroethyl Vinyl Ether	10	ND	<500	<500
trans-1,3-Dichloropropene	1	ND	<50	<50
4-Methyl-2-pentanone (MIBK)	10	ND	<500	<500
2-Hexanone	10	ND	<500	<500
Toluene	1	ND	<50	770
cis-1,3-Dichloropropene	1	ND	<50	<50
1,1,2-Trichloroethane	1	ND	<50	<50
Tetrachloroethene (PCE)	1	25	1,400	<50
Dibromochloromethane	1	ND	<50	<50
Chlorobenzene	1	ND	<50	<50
Ethylbenzene	1	ND	<50	960
Styrene	1	ND	<50	<50
Total Xylenes	5	ND	<250	6,200
Bromoform	1	ND	<50	<50
1,1,2,2-Tetrachloroethane	1	ND	<50	<50
1,3-Dichlorobenzene	1	ND	<50	<50
1,4-Dichlorobenzene	1	ND	<50	<50
1,2-Dichlorobenzene	1	ND	<50	<50

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

Approved By: Kevin A Murphy Date: August 17, 1994

3S44/060194

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

Analytical Report

Client: IWM
Project: ARCO Facility No. 276
Sample Matrix: Water

Service Request: S940868
Date Collected: 8/3/94
Date Received: 8/5/94
Date Extracted: NA

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

	Sample Name:	MW-8 (32.6)	RW-1 (33.9)	WGR-3 (25.1)
	Lab Code:	S940868-008	S940868-009	S940868-010
	Date Analyzed:	8/9/94	8/9/94	8/9/94
Analyte	**MRL**			
Chloromethane	10	ND	ND	ND
Vinyl Chloride	10	ND	ND	ND
Bromomethane	10	ND	ND	ND
Chloroethane	10	ND	ND	ND
Trichlorofluoromethane (CFC 11)	1	ND	ND	ND
Trichlorotrifluoroethane (CFC 113)	10	ND	ND	ND
1,1-Dichloroethene	1	ND	ND	ND
Acetone	20	ND	ND	ND
Carbon Disulfide	1	ND	ND	ND
Methylene Chloride	10	ND	ND	ND
trans-1,2-Dichloroethene	1	ND	ND	ND
cis-1,2-Dichloroethene	1	ND	ND	ND
2-Butanone (MEK)	10	ND	ND	ND
1,1-Dichloroethane	1	ND	ND	ND
Chloroform	1	ND	ND	ND
1,1,1-Trichloroethane (TCA)	1	ND	ND	ND
Carbon Tetrachloride	1	ND	ND	ND
Benzene	1	ND	ND	ND
1,2-Dichloroethane	1	ND	ND	ND
Vinyl Acetate	10	ND	ND	ND
Trichloroethene (TCE)	1	ND	4	ND
1,2-Dichloropropane	1	ND	ND	ND
Bromodichloromethane	1	ND	ND	ND
2-Chloroethyl Vinyl Ether	10	ND	ND	ND
trans-1,3-Dichloropropene	1	ND	ND	ND
4-Methyl-2-pentanone (MIBK)	10	ND	ND	ND
2-Hexanone	10	ND	ND	ND
Toluene	1	ND	ND	ND
cis-1,3-Dichloropropene	1	ND	ND	ND
1,1,2-Trichloroethane	1	ND	ND	ND
Tetrachloroethene (PCE)	1	ND	350	ND
Dibromochloromethane	1	ND	ND	ND
Chlorobenzene	1	ND	ND	ND
Ethylbenzene	1	ND	ND	ND
Styrene	1	ND	ND	ND
Total Xylenes	5	ND	ND	ND
Bromoform	1	ND	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND	ND
1,3-Dichlorobenzene	1	ND	ND	ND
1,4-Dichlorobenzene	1	ND	ND	ND
1,2-Dichlorobenzene	1	ND	ND	ND

Approved By: Kevin A Murphy Date: August 17, 1994

3S44/060194

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

Client: IWM
Project: ARCO Facility No. 276
Sample Matrix: Water

Service Request: S940868
Date Collected: 8/3/94
Date Received: 8/5/94
Date Extracted: NA

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

	Sample Name:	**Method Blank**	**Method Blank**
	Lab Code:	S940809-WB	S940810-WB
	Date Analyzed:	8/9/94	8/10/94
Analyte	**MRL**		
Chloromethane	10	ND	ND
Vinyl Chloride	10	ND	ND
Bromomethane	10	ND	ND
Chloroethane	10	ND	ND
Trichlorofluoromethane (CFC 11)	1	ND	ND
Trichlorotrifluoroethane (CFC 113)	10	ND	ND
1,1-Dichloroethene	1	ND	ND
Acetone	20	ND	ND
Carbon Disulfide	1	ND	ND
Methylene Chloride	10	ND	ND
trans-1,2-Dichloroethene	1	ND	ND
cis-1,2-Dichloroethene	1	ND	ND
2-Butanone (MEK)	10	ND	ND
1,1-Dichloroethane	1	ND	ND
Chloroform	1	ND	ND
1,1,1-Trichloroethane (TCA)	1	ND	ND
Carbon Tetrachloride	1	ND	ND
Benzene	1	ND	ND
1,2-Dichloroethane	1	ND	ND
Vinyl Acetate	10	ND	ND
Trichloroethene (TCE)	1	ND	ND
1,2-Dichloropropane	1	ND	ND
Bromodichloromethane	1	ND	ND
2-Chloroethyl Vinyl Ether	10	ND	ND
trans-1,3-Dichloropropene	1	ND	ND
4-Methyl-2-pentanone (MIBK)	10	ND	ND
2-Hexanone	10	ND	ND
Toluene	1	ND	ND
cis-1,3-Dichloropropene	1	ND	ND
1,1,2-Trichloroethane	1	ND	ND
Tetrachloroethene (PCE)	1	ND	ND
Dibromochloromethane	1	ND	ND
Chlorobenzene	1	ND	ND
Ethylbenzene	1	ND	ND
Styrene	1	ND	ND
Total Xylenes	5	ND	ND
Bromoform	1	ND	ND
1,1,2,2-Tetrachloroethane	1	ND	ND
1,3-Dichlorobenzene	1	ND	ND
1,4-Dichlorobenzene	1	ND	ND
1,2-Dichlorobenzene	1	ND	ND

Approved By: Keon A Murphy Date: Aug 17, 1994

3S44/060194

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APPENDIX A

LABORATORY QC RESULTS

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

Client: IWM
Project: ARCO Facility No. 276

Service Request: S940868
Date Analyzed: 8/12/94

Initial Calibration Verification (ICV) Summary
Total Recoverable Petroleum Hydrocarbons
EPA Method 418.1
Units: ppm

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Hydorcarbon Mixture	40	43.1	108	90-110

Approved By: _____ Date: August 17, 1994

ICV25AL/060194

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Service Request:**	S940868
Project:	ARCO Facility No. 276	**Date Collected:**	8/3/94
Sample Matrix:	Water	**Date Received:**	8/5/94
		Date Extracted:	8/11/94
		Date Analyzed:	8/12/94

Matrix Spike/Duplicate Matrix Spike Summary
Total Recoverable Petroleum Hydrocarbons
EPA Method 418.1
Units: mg/L (ppm)

Sample Name: Batch QC
Lab Code: S940871-006

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Hydrocarbon Mixture	8.0	8.0	0.7	6.69	7.28	75	92	57-127	8

Approved By: Kevin A Murphy Date: August 17, 1994

DMS1S/060194

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 276
Sample Matrix: Water

Service Request: S940868
Date Collected: 8/3/94
Date Received: 8/5/94
Date Extracted: NA
Date Analyzed: 8/10/94

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 (33.1)	S940868-002	101
MW-3 (33.5)	S940868-003	100
MW-4 (43.8)	S940868-004	102
MW-5 (35)	S940868-005	100
MW-6 (43.6)	S940868-006	100
MW-7 (24.9)	S940868-007	103
MW-8 (32.6)	S940868-008	102
RW-1 (33.9)	S940868-009	97
WGR-3 (25.1)	S940868-010	101
MW-1 (33.1) MS	S940868-002MS	100
MW-1 (33.1) DMS	S940868-002DMS	98
Method Blank	S940810-WB	96

CAS Acceptance Limits: 69-116

Approved By: Kevin A Murphy Date: August 17, 1994

SUR1/062994

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

Client: IWM
Project: ARCO Facility No. 276

Service Request: S940868
Date Analyzed: 8/10/94

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	27.5	110	85-115
Toluene	25	26.2	105	85-115
Ethylbenzene	25	26.6	106	85-115
Xylenes, Total	75	77.4	103	85-115
Gasoline	250	242	97	90-110

Approved By: _____ Date: August 17, 1994

ICV25AL/060194

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Service Request:**	S940868
Project:	ARCO Facility No. 276	**Date Collected:**	8/3/94
Sample Matrix:	Water	**Date Received:**	8/5/94
		Date Extracted:	NA
		Date Analyzed:	8/10/94

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

Sample Name: MW-1 (33.1)
Lab Code: S940868-002

Analyte	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference
Benzene	25	25	ND	27.4	26.8	110	107	75-135	2
Toluene	25	25	ND	25.9	25.5	104	102	73-136	2
Ethylbenzene	25	25	ND	26.1	25.7	104	103	69-142	2

Approved By: Karen A Murphy Date: August 17, 1994

DMS1S/060194

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

Client: IWM
Project: ARCO Facility No. 276
Sample Matrix: Water

Service Request: S940868
Date Collected: 8/3/94
Date Received: 8/5/94
Date Extracted: NA
Date Analyzed: 8/9,10/94

Surrogate Recovery Summary
Volatile Organic Compounds
EPA Method 8240

Sample Name	Lab Code	Percent Recovery 1,2-Dichloroethane-D_4	Toluene-D_8	4-Bromofluorobenzene
MW-1 (33.1)	S940868-002	101	102	98
MW-3 (33.5)	S940868-003	105	96	100
MW-4 (43.8)	S940868-004	102	97	98
MW-5 (35)	S940868-005	101	98	99
MW-6 (43.6)	S940868-006	99	101	97
MW-7 (24.9)	S940868-007	103	98	103
MW-8 (32.6)	S940868-008	100	96	98
RW-1 (33.9)	S940868-009	101	98	99
WGR-3 (25.1)	S940868-010	102	103	100
MW-3 (33.5) MS	S940868-003MS	104	101	97
MW-3 (33.5) DMS	S940868-003DMS	102	98	99
Method Blank	S940809-WB	103	96	96
Method Blank	S940810-WB	100	94	97
CAS Acceptance Limits:		76-114	88-110	86-115

Approved By: _____ Date: August 17, 1994

SUR3/060194

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

Client: IWM
Project: ARCO Facility No. 276

Service Request: S940868
Date Analyzed: 7/14/94

Initial Calibration Verification (ICV) Summary
Volatile Organic Compounds
EPA Method 8240
Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Chloromethane	50	49.5	99	70-130
Vinyl Chloride	50	57.6	115	70-130
Bromomethane	50	59.2	118	70-130
Chloroethane	50	52.6	105	70-130
Acetone	50	52.7	105	70-130
1,1-Dichloroethene	50	48.9	98	70-130
Carbon Disulfide	50	48.8	98	70-130
Methylene Chloride	50	49.9	100	70-130
trans-1,2-Dichloroethene	50	48.3	97	70-130
cis-1,2-Dichloroethene	50	48.2	96	70-130
1,1-Dichloroethane	50	48.8	98	70-130
Vinyl Acetate	50	47.8	96	70-130
2-Butanone (MEK)	50	59.2	118	70-130
Chloroform	50	50.0	100	70-130
1,1,1-Trichloroethane (TCA)	50	47.9	96	70-130
Carbon Tetrachloride	50	42.7	85	70-130
Benzene	50	46.1	92	70-130
1,2-Dichloroethane	50	50.1	100	70-130
Trichloroethene (TCE)	50	47.0	94	70-130
1,2-Dichloropropane	50	49.4	99	70-130
Bromodichloromethane	50	48.9	98	70-130
2-Chloroethyl Vinyl Ether	50	43.4	87	70-130
2-Hexanone	50	63.3	127	70-130
trans-1,3-Dichloropropene	50	50.1	100	70-130
Toluene	50	46.7	93	70-130
cis-1,3-Dichloropropene	50	47.8	96	70-130
1,1,2-Trichloroethane	50	52.7	105	70-130
Tetrachloroethene (PCE)	50	49.3	99	70-130
Dibromochloromethane	50	53.0	106	70-130
Chlorobenzene	50	49.3	99	70-130
Ethylbenzene	50	48.2	96	70-130
o- Xylene	50	49.8	100	70-130
Styrene	50	49.8	100	70-130
Bromoform	50	50.6	101	70-130
1,1,2,2-Tetrachloroethane	50	55.0	110	70-130

Approved By: Kevin A Murphy Date: August 17, 1994

ICV4I/060194

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Service Request:**	S940868
Project:	ARCO Facility No. 276	**Date Collected:**	8/3/94
Sample Matrix:	Water	**Date Received:**	8/5/94
		Date Extracted:	NA
		Date Analyzed:	8/9/94

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

Sample Name: MW-3 (33.5)
Lab Code: S940868-003

Analyte	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference
1,1-Dichloroethene	1,000	1,000	ND	812	745	81	74	61-145	9
Trichloroethene	1,000	1,000	ND	884	988	88	99	71-120	11
Chlorobenzene	1,000	1,000	ND	924	952	92	95	75-130	3
Toluene	1,000	1,000	ND	966	948	97	95	76-125	2
Benzene	1,000	1,000	ND	888	900	89	90	76-127	1

Approved By: Kevin A Murphy Date: August 17, 1994

DMS1S/060194

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

APPENDIX B

CHAIN OF CUSTODY

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

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. IWM-94-5CC

Chain of Custody

ARCO Facility no. A276	City (Facility) OAKland	Project manager (Consultant) TOM DeLong / J. Young	Laboratory name Columbia
ARCO engineer MW	Telephone no. (ARCO) 415/571 2434	Telephone no. (Consultant) 408/942 8955	Fax no. (Consultant) 408/942 1499	Contract number 07077
Consultant name IWM. / RESNA	Address (Consultant) 950 Ames av. Mtn CA. 95035		Method of shipment CAS COURIER

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		✓		✓	✓	8-3-94	800		✓	✓				✓						
MW-1	2	4		✓		✓	✓		1012		✓	✓				✓						
MW-3	3	4		✓		✓	✓		1140		✓	✓				✓						
MW-4	4	6		✓		✓	✓		1205		✓	✓		✓		✓						
MW-5	5	4		✓		✓	✓		1329		✓	✓				✓						
MW-6	6	4		✓		✓	✓		1100		✓	✓				✓						
MW-7	7	4		✓		✓	✓		1111		✓	✓				✓						
MW-8	8	4		✓		✓	✓		1040		✓	✓				✓						
RW-1	9	4		✓		✓	✓		1159		✓	✓				✓						
WGR-3	10	4		✓		✓	✓		1059		✓	✓				✓						

Special detection Limit/reporting

Special QA/QC

Remarks: Add on FB-1

Lab number 5940868

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 8/5/94	Time 1425	Received by
Relinquished by	Date 8/	Time	Received by
Relinquished by	Date	Time	Received by laboratory — Date 8/5/94 — Time 1425

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

ARPC-3292 (2-91)