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

Date July 18, 1995
Project 0805-120.04

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	First quarter 1995 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
Michael Whelan, ARCO Products Company
Beth Doris, ARCO Legal Department
David Larsen, EMCON
File

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

Date: June 30, 1995

Re: ARCO Station # 10600 MacArthur Boulevard • Oakland, CA
First Quarter 1995 Groundwater Monitoring Report

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

Submitted by:

Michael R. Whelan
Environmental Engineer

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

June 30, 1995
Project 0805-120.04

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

Re: First quarter 1995 groundwater monitoring program results and remediation system performance evaluation report, SVE system at retail service station, 10600 MacArthur Boulevard, Oakland, California

Dear Mr. Whelan:

This letter presents the results of the first quarter 1995 groundwater monitoring program for the retail service station at 10600 MacArthur Boulevard, Oakland, California (Figure 1). Operation and performance data for the site's soil-vapor extraction (SVE) system are also presented. 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.

BACKGROUND

Site History and Previous Assessments. There are four underground storage tanks (USTs), designated T1 through T4, in the western portion of the site. These tanks were replacements for four former USTs (FT1 through FT4) that were removed in February 1990. The four former USTs were located in the southern portion of the site. A former waste-oil tank adjacent to the northeastern wall of the station building was removed in 1988. Because of the presence of tetrachloroethene (perchloroethlyene [PCE]) in on- and off-site monitoring wells, four soil samples collected beneath the waste-oil tank were analyzed for volatile organic compounds (VOCs) including PCE, even though ARCO Products Company (ARCO) never used PCE. Analytical results indicated no detectable PCE in the soil samples collected. The locations of the former tanks, existing tanks, on- and off-site groundwater monitoring wells, and on-site vapor extraction wells are shown in Figure 2.

Adjacent to and immediately southeast of the station is a portion of the former Truck Manufacturing Plant (now a parking lot for Foothill Square Shopping Center). Aerial photographs suggest the possible presence of fuel tanks, fuel dispensers, and storage drums on

several portions of the former Truck Manufacturing Plant. Since groundwater monitoring began in 1989, PCE has been detected in groundwater in both on- and off-site monitoring wells. The highest concentrations of PCE have typically been detected in well MW-6, in the deeper water-bearing zone upgradient from the site, on the former Truck Manufacturing Plant site.

Since 1988, ARCO has conducted several site assessment investigations both on- and off-site to delineate the lateral and vertical extent of gasoline-impacted soils and groundwater at the sites. A total of six on- and off-site groundwater monitoring wells (MW-1, MW-3 through MW-6, and MW-8) and one recovery well (RW-1) screened in the deeper water-bearing zone were installed to evaluate the groundwater flow direction of the deeper water-bearing zone, and to determine the lateral and vertical extent of petroleum-hydrocarbon-impacted soils and groundwater at the sites. Wells MW-2 and MW-7 were installed on- and off-site to evaluate groundwater quality in the shallow water-bearing zone. Wells MW-1 through MW-8, WGR-3, and RW-1 are monitored quarterly.

On- and Off-Site Soil-Vapor Extraction Systems. ARCO installed 26, 3/4-inch galvanized steel probes off site in the former Truck Manufacturing Plant site to remediate vadose-zone soils impacted by gasoline above the shallow water-bearing zone. The probes and well WGR-3 were connected via subsurface piping to a remediation compound on the ARCO site. This SVE well configuration was operated by EVAX Technologies (EVAX) from September 6, 1990, to March 21, 1991. The EVAX treatment system consisted of a propane-fired internal combustion (IC) engine. Pacific Environmental Group (PEG) replaced the IC engine with a 500 standard cubic foot per minute (scfm) gas-fired Anguil catalytic oxidizer (Cat-ox) and operated the off-site SVE system from June 12, 1991, to August 25, 1992.

(onsite) A second phase of SVE construction was completed at the ARCO site in July 1992. A total of seven on-site SVE wells (VW-1 through VW-7) were installed and used, along with on-site well MW-2, to remediate hydrocarbon-impacted vadose-zone and capillary-fringe soils in the shallow water-bearing zone on site. Hydrocarbon vapor extracted from these wells is directed via subsurface remediation piping using a 1.5-horsepower (hp) regenerative blower to the existing Cat-ox previously installed by PEG in the on-site remediation compound. The on-site SVE system was operated by PEG from August 25 to October 5, 1992. RESNA Industries, Inc. (RESNA, formerly Applied Geosystems), operated the SVE system from October 6, 1992, to May 1994. Operation of the SVE system is regulated under Bay Area Air Quality Management District (BAAQMD) Permit to Operate No. 5998. In December 1993, the SVE system was shut down because of low hydrocarbon concentrations in extracted vapor from the wells. The system was pulsed during first quarter 1994. After the site was transferred from RESNA to EMCON in October 1994, EMCON restarted the system in December 1994.

MONITORING PROGRAM FIELD PROCEDURES

EMCON performed the first quarter 1995 groundwater monitoring event on March 10, 1995. Field work this quarter included (1) measuring depths to groundwater and subjectively analyzing groundwater for the presence of floating product in wells MW-1 through MW-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. Floating product entered well MW-7 during purging; therefore, this well was not sampled during the first quarter 1995. Copies of all field data sheets from the first quarter 1995 groundwater monitoring event are included in Appendix A.

ANALYTICAL PROCEDURES

Groundwater samples collected during first quarter 1995 monitoring were analyzed for total petroleum hydrocarbons as gasoline (TPHG); benzene, toluene, ethylbenzene, and total xylenes (BTEX); and 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* (EPA 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 in the *Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites* (August 10, 1990) for analysis of samples from petroleum-hydrocarbon-impacted sites.

MONITORING PROGRAM RESULTS

Results of the first quarter 1995 groundwater monitoring event are summarized in Table 1 and illustrated in Figure 2. Concentrations of PCE 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, total petroleum hydrocarbons as diesel [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 first quarter 1995 analytical results and chain-of-custody documentation are included in Appendix B.

Groundwater elevation data collected on March 10, 1995, were used in calculating groundwater elevations for first quarter 1995. Consistent with previous quarters, EMCON used groundwater elevation data from wells MW-1, MW-3, and MW-8 to determine the local groundwater flow direction and gradient. Based on these data, EMCON estimated that groundwater beneath the site flows north-northeast. The small variance in groundwater elevations across the site results in a relatively flat hydraulic gradient of approximately 0.003 foot per foot, which may be superimposed upon by regional groundwater flow patterns. Figure 2 illustrates groundwater elevations and TPHG and benzene analytical data for first quarter 1995.

Groundwater samples collected from the deeper water-bearing zone wells, MW-1, MW-3 through MW-6, MW-8, RW-1, and off-site well WGR-3, did not contain detectable concentrations of TPHG or benzene. Method reporting limits for TPHG and benzene were less than 50 micrograms per liter (µg/L) and less than 0.5 µg/L, respectively. In wells MW-1, MW-3 through MW-6, and RW-1, detection limits were raised because of the presence of PCE in the samples. Groundwater samples collected from well MW-2, screened in the shallow water-bearing zone, contained 2,800 µg/L TPHG and 88 µg/L benzene. Floating product entered well MW-7 (screened in the shallow water-bearing zone) during purging; therefore, the well was not sampled. Groundwater samples collected from well MW-4 did not contain detectable concentrations of TRPH (less than 500 µg/L).

Groundwater samples collected from wells MW-8 and WGR-3 did not contain detectable concentrations of VOCs (Table 5). Groundwater samples collected from wells MW-1, MW-3 through MW-6, and RW-1, screened in the deeper water-bearing zone, contained concentrations of PCE from 170 to 2,600 µg/L (Figure 3). Groundwater from well MW-2, screened in the shallow water-bearing zone, contained a benzene concentration of 12 µg/L, but did not contain detectable concentrations of PCE.

A total of 18.54 gallons of floating product has been recovered from wells MW-2 and MW-7 since 1991 (Table 6). No floating product has been recovered since 1992.

REMEDIAL PERFORMANCE EVALUATION

SVE System

Description. The on- and off-site SVE systems are briefly described in the "Background" section of this report.

Operation. EMCON restarted the on-site SVE system on December 22, 1994. System operation and performance data since restart of the system in December 1994 are detailed in Tables 7 and 8. Extraction well data (i.e., which well was on-line) are summarized in Table 9. Please refer to *Fourth Quarter 1994 Groundwater Monitoring Results and Remediation System Performance Evaluation Report* (EMCON, March 1995) for operation and performance data for the on- and off-site SVE systems between September 1990 and May 1994.

The SVE system operated for a total of 89 days (2,136 hours) during the 89-day reporting period (100 percent operational) from January 12 to April 11, 1995. During first quarter 1995, several different combinations of wells were brought on-line, to maximize the SVE system's hydrocarbon removal rates. Table 9 summarizes the status of the wells that have been used for soil venting since December 22, 1994.

Monitoring. Consistent with site-specific BAAQMD air permit requirements, the operating temperature of the Cat-ox unit is measured and recorded continuously during system operation. Once a month, air samples are collected at sample ports influent to the Cat-ox (before fresh-air dilution); after fresh-air dilution; and effluent from the unit (identified as "well-field influent," "system influent," and "system effluent" in Table 7). Air samples are submitted to a state-certified laboratory for chemical analysis. The samples are analyzed for total volatile hydrocarbons as gasoline (TVHG) and BTEX by USEPA methods 8015 and 8020, respectively. Analytical results and chain-of-custody records for air samples collected during this reporting period are enclosed in Appendix C.

In addition to the parameters described above, the SVE system is monitored once a month for (1) TVHG concentrations in extracted vapor from each well using an Eagle Monitoring Systems EM-700 partially-heated flame-ionization detector (FID) (Table 9); (2) applied vacuum on vapor extraction wells; and (3) average extracted air flow rate from the vapor extraction wells. As required by the site-specific BAAQMD permit, extracted vapor is also monitored with an FID once every two weeks at sample ports located influent to the Cat-ox (before fresh air dilution); after fresh-air dilution; and effluent from the unit (identified as "well-field influent [I-1]," "system influent [I-2]," and "system effluent [E-1]," in Table 8 and in field data sheets, Appendix D). Copies of all original

operation and maintenance field data sheets generated during first quarter 1995 are provided in Appendix D.

Air Sample Results. Copies of analytical results and chain-of-custody documentation for all air samples collected during the first quarter 1995 are enclosed in Appendix C.

Destruction Efficiency and Emission Rates. The destruction efficiency of the Cat-ox unit was 100 percent for the sampling events on January 17 and February 16, 1995 (Tables 7 and 8). The system destruction efficiency for the March 14, 1995, sampling event was not calculated because the TVHG concentrations in the air samples collected influent to and effluent from the unit were below laboratory detection limits. Since nondetectable levels of benzene were reported in air samples collected effluent from the Cat-ox unit, there was no emission of benzene to the atmosphere. Hence, the unit was in compliance with the BAAQMD air permit requirement of a benzene emission rate less than 0.11 pound per day.

Hydrocarbon Removal Rates. Based on the information provided by EVAX, PEG, and RESNA, approximately 7,666 pounds (1,236 gallons) of petroleum hydrocarbons were removed by the on- and off-site SVE systems from September 1990 to December 22, 1994.

Table 7 summarizes hydrocarbon removal rates, pounds of hydrocarbons removed this period, and cumulative pounds of hydrocarbons removed since startup. The calculations and assumptions for estimating hydrocarbon removal rates for the SVE system are shown in Table 7.

Approximately 23.1 pounds (or 3.7 gallons) of hydrocarbons were recovered by SVE system operation during this 89-day period. A total of approximately 7,699 pounds (or 1,242 gallons) of hydrocarbons has been recovered from the site since system startup in September 1990.

LIMITATIONS

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

SITE STATUS UPDATE

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

First Quarter 1995 Activities

- Attended a March 28, 1995, pre-enforcement hearing at the ACHCSA's office.
- Prepared quarterly groundwater monitoring and SVE system performance evaluation report for fourth quarter 1994.
- Performed quarterly groundwater monitoring for first quarter 1995.
- Pulsed the off-site SVE system.
- Received approval from ACHCSA in it's letter dated February 15, 1995, to supplement the existing off-site SVE system on Foothill Square Shopping Center property.

Work Anticipated for Second Quarter 1995

- Submit quarterly groundwater monitoring report for fourth quarter 1994.
- Prepare and submit quarterly groundwater monitoring and SVE system performance evaluation report for first quarter 1995.
- Perform quarterly groundwater monitoring for second quarter 1995.
- Submit a response to ACHCSA on discussion held during the March 28, 1995, pre-enforcement hearing, and to previously submitted letters and reports by Augeas Corporation.
- Continue with on- and off-site SVE remediation.

Please call if you have questions.

Sincerely,

EMCON

David Larsen
Project Coordinator

Valli Voruganti
Project Engineer

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

REGISTERED GEOLOGIST
LYNN A. GALLAGHER
RG6090
STATE OF CALIFORNIA

Attachments:

Table 1 -	Groundwater Monitoring Data, First Quarter 1995
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
Table 7 -	Soil-Vapor Extraction System Operation and Performance Data
Table 8 -	Field Vapor Monitoring Results and Destruction Efficiency
Table 9 -	Soil-Vapor Extraction Well Data
Figure 1 -	Site Location
Figure 2 -	Groundwater Data, First Quarter 1995
Figure 3 -	Tetrachloroethene (PCE) Concentrations in Groundwater, First Quarter 1995
Appendix A -	Field Data Sheets, First Quarter 1995 Groundwater Monitoring Event
Appendix B -	Analytical Results and Chain-of-Custody Documentation, Groundwater Monitoring, First Quarter 1995
Appendix C -	Analytical Results and Chain-of-Custody Documentation for SVE System Air Samples, First Quarter 1995
Appendix D -	Operation and Maintenance Field Data Sheets for On-Site SVE System, First Quarter 1995

cc: Barney Chan, ACHCSA
Kevin Graves, RWQCB-SFBR
Richard Gilcrease, Drake Builders
Beth Doris, ARCO Legal Department
John Young, EMCON

Table 1
Groundwater Monitoring Data
First Quarter 1995

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

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		µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	03-10-95	55.92	26.26	29.66	ND	NNE	0.003	03-10-95	<57*	<0.5	<0.5	<0.5	<0.5
MW-2	03-10-95	55.10	13.98	41.12	ND	NNE	0.003	03-11-95	2800	88	12	16	200
MW-3	03-10-95	56.55	26.74	29.81	ND	NNE	0.003	03-11-95	<440*	<0.5	<0.5	<0.5	0.7
MW-4	03-10-95	55.98	26.22	29.76	ND	NNE	0.003	03-11-95	<780*	<1.0**	<1.0**	<1.0**	1
MW-5	03-10-95	55.43	25.62	29.81	ND	NNE	0.003	03-10-95	<110*	<0.5	<0.5	<0.5	<0.5
MW-6	03-10-95	61.21	31.54	29.67	ND	NNE	0.003	03-11-95	<390*	<0.5	<0.5	<0.5	<0.5
MW-7	03-10-95	58.22	17.69	40.53	ND^^	NNE	0.003	03-11-95	Not sampled: floating product entered the well during purging				
MW-8	03-10-95	53.65	23.60	30.05	ND	NNE	0.003	03-10-95	<50	<0.5	<0.5	<0.5	<0.5
RW-1	03-10-95	56.32	26.48	29.84	Sheen	NNE	0.003	03-10-95	<180*	<0.5	<0.5	<0.5	<0.5
WGR-3	03-10-95	NR	15.20	NR	ND	NR	NR	03-11-95	<50	<0.5	<0.5	<0.5	<0.5

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
TPHG: total petroleum hydrocarbons as gasoline
µg/L =micrograms per liter
ND: none detected
NNE: north-northeast
*: 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), and the chromatogram does not match the typical gasoline fingerprint
**: raised method reporting limit due to matrix interference requiring sample dilution
^^: floating product entered the well during purging
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: 06-30-95
Project Number: 0805-120.04

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
MW-1	12-06-94	55.92	31.89	24.03	ND	W	0.001
MW-1	03-10-95	55.92	26.26	29.66	ND	NNE	0.003

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-2	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 vehicle					
MW-2	12-06-94	55.10	14.74	40.36	Sheen	W	0.001
MW-2	03-10-95	55.10	13.98	41.12	ND	NNE	0.003

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

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
MW-3	12-06-94	56.55	32.46	24.09	ND	W	0.001
MW-3	03-10-95	56.55	26.74	29.81	ND	NNE	0.003

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Desig-nation	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
MW-4	12-06-94	55.98	31.91	24.07	ND	W	0.001
MW-4	03-10-95	55.98	26.22	29.76	ND	NNE	0.003

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

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
MW-5	12-06-94	55.43	31.44	23.99	ND	W	0.001
MW-5	03-10-95	55.43	25.62	29.81	ND	NNE	0.003

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Desig-nation	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-6	12-06-94	61.21	37.33	23.88	ND	W	0.001
MW-6	03-10-95	61.21	31.54	29.67	ND	NNE	0.003

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

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-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
MW-7	12-06-94	58.22	18.37	## 39.86	0.02	W	0.001
MW-7	03-10-95	58.22	17.69	40.53	ND^^	NNE	0.003

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

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-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
MW-8	12-06-94	53.65	29.66	23.99	ND	W	0.001
MW-8	03-10-95	53.65	23.60	30.05	ND	NNE	0.003

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Desig-nation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
RW-1	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
RW-1	12-06-94	56.32	32.24	24.08	ND	W	0.001
RW-1	03-10-95	56.32	26.48	29.84	Sheen	NNE	0.003

Table 2
Historical Groundwater Elevation Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

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
WGR-3	12-06-94	NR	17.52	NR	ND	NR	NR
WGR-3	03-10-95	NR	15.20	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
W: west
NNE: north-northeast
^: 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
##. corrected elevation (Z'), such that: $Z' = Z + (h * 0.73)$ where: Z = measured elevation, h = floating product thickness, 0.73 = density ratio of oil to water

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Desig-nation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		µg/L	µg/L	µg/L	µg/L	µg/L
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-1	12-06-94	<50	<0.5	<0.5	<0.5	<0.5
MW-1	03-10-95	<57*	<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: 06-30-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		µg/L	µg/L	µg/L	µg/L	µg/L
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 vehicle				
MW-2	12-07-94	26000	570	43	220	1100
MW-2	03-11-95	2800	88	12	16	200

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		µg/L	µg/L	µg/L	µg/L	µg/L
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-3	12-06-94	<380*	<0.5	<0.5	<0.5	<0.5
MW-3	03-11-95	<440*	<0.5	<0.5	<0.5	0.7

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
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
MW-4	12-06-94	<970*	<2.5**	<2.5**	<2.5**	<2.5**
MW-4	03-11-95	<780*	<1.0**	<1.0**	<1.0**	1

Table 3
Historical Groundwater Analytical Data
(TPHG and BTEX)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
MW-5	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-5	12-06-94	<550*	<0.5	0.6	1.1	2
MW-5	03-10-95	<110*	<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***
MW-6	12-07-94	<720*	<1**	<1**	<1**	<1**
MW-6	03-11-95	<390*	<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: 06-30-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
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-7	12-07-94	260000	<200***	380	2200	11000
MW-7	03-11-95	Not sampled: floating product entered the well during purging				
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
MW-8	12-07-94	<50	<0.5	<0.5	<0.5	<0.5
MW-8	03-10-95	<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
RW-1	12-07-94	<79*	<0.5	<0.5	<0.5	<0.5
RW-1	03-10-95	<180*	<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: 06-30-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
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
WGR-3	12-07-94	<50	<0.5	<0.5	<0.5	0.6
WGR-3	03-11-95	<50	<0.5	<0.5	<0.5	<0.5

TPHG: total petroleum hydrocarbons as gasoline
µg/L: micrograms per liter
#: 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), and the chromatogram does not match the typical gasoline fingerprint
**: raised method reporting limit due to matrix interference requiring sample dilution
***: 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: 06-30-95
Project Number: 0805-120.04

Well Designation	Water Sample Field Date	TOG or TRPH µg/L	TPHD µg/L	Cadmium by EPA 6010 µg/L	Chromium by EPA 6010 µg/L	Lead by EPA 7421 µg/L	Nickel by EPA 6010 µg/L	Zinc by EPA 6010 µg/L
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
MW-4	12-06-94	1800	NA	NA	NA	NA	NA	NA
MW-4	03-11-95	<500	NA	NA	NA	NA	NA	NA

TOG: total oil and grease by standard methods 5520 C&F
TRPH: total recoverable petroleum hydrocarbons by USEPA Method 418.1
TPHD: total petroleum hydrocarbons as diesel by USEPA Method 3510/California DHS LUFT Method
µg/L: micrograms per liter
NA: not analyzed

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

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
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
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	<5
MW-1	12-06-94	17	<1		<1		<1	<1	<1	<5
MW-1	03-10-95	170	<1		<1		<1	<1	<1	<5

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

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
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
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								
MW-2	12-06-94	<5	<5		<5		620	28	220	1200
MW-2	03-11-95	<1	<1		<1		110	12	15	240

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

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
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
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	<100
MW-3	12-06-94	1100	<25		<25		<25	<25	<25	<125
MW-3	03-11-95	1700	<10		<10		<10	<10	<10	<50

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

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 µg/L	TCE µg/L	1,2-DCE µg/L	cis-1,2-DCE µg/L	Freon 12 µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
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	<100
MW-4	12-06-94	2200	<20		<20		<20	<20	<20	<100
MW-4	03-11-95	2600	<20		<20		<20	<20	<20	<100

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

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
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
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	<5
MW-5	12-06-94	1800	<20		<20		<20	<20	<20	<100
MW-5	03-10-95	270	<5		<5		<5	<5	<5	<25

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

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 µg/L	TCE µg/L	1,2-DCE µg/L	cis-1,2-DCE µg/L	Freon 12 µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
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	<250
MW-6	12-06-94	2000	<50		<50		<50	<50	<50	<250
MW-6	03-11-95	1300	<20		<20		<20	<20	<20	<100

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

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
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
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		640	770	960	6200
MW-7	12-06-94	<50	<50		<50		230	180	750	4800
MW-7	03-11-95	Not sampled: floating product entered the well during purging								

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

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 µg/L	TCE µg/L	1,2-DCE µg/L	cis-1,2-DCE µg/L	Freon 12 µg/L	Benzene µg/L	Toluene µg/L	Ethyl-benzene µg/L	Total Xylenes µg/L
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	<5
MW-8	12-06-94	2	<1		<1		<1	<1	<1	<5
MW-8	03-10-95	<1	<1		<1		<1	<1	<1	<5

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

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
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
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	<5
RW-1	12-06-94	340	<5		<5		<5	<5	<5	<25
RW-1	03-10-95	260	<5		<5		<5	<5	<5	<25

Table 5
Historical Groundwater Analytical Data
(Volatile Organic Compounds)

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

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
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
WGR-3	05-02-94	<1	<1	<1	<1		<1	<1	<1	<5
WGR-3	08-03-94	<1	<1		<1		<1	<1	<1	<5
WGR-3	12-06-94	4	<1		<1		<1	<1	<1	<5
WGR-3	03-11-95	<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
µg/L: micrograms per liter
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: 06-30-95
Project Number: 0805-120.04

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
MW-2 and MW-7	1995	0.00
	1991 to 1995 Total:	18.54

Table 7
Soil-Vapor Extraction System
Operation and Performance Data

Location: 10600 and 10700 MacArthur Boulevard
Oakland, California

Vapor Treatment Unit: Anguil Energy Systems
Remedi-Cat, 500cfm
Catalytic Oxidizer

Consultant: EMCON
1921 Ringwood Avenue
San Jose, California

Start-Up Date: 09-06-90
Reporting Period From: 09-06-90
To: 04-11-95

Date Begin:		09-06-90	12-22-94	01-12-95	02-14-95	03-13-95
Date End:		12-22-94	01-12-95	02-14-95	03-13-95	04-11-95
Mode of Oxidation:		Catalytic (14)	Catalytic	Catalytic	Catalytic	Catalytic
Days of Operation:		NA (15)	11.7	33.0	27.0	29.0
Days of Downtime:		NA	9.3	0.0	0.0	0.0
Vapor Monitoring Concentrations						
On-site Well Field, as gasoline:	mg/m3 (1) (2)	NA	116	<60	<60	4.4
	ppmv (3) (4)	NA	32	<17	<17	1.2
Off-site Well Field, as gasoline:	mg/m3	NA	closed	closed	<60	4.9
	ppmv	NA	closed	closed	<17	1.4
System Influent, as gasoline:	mg/m3	NA	116	<60	<60	<3.6
	ppmv	NA	32	<17	<17	<1.0
System Effluent, as gasoline:	mg/m3	NA	<60	<60	<60	4.6
	ppmv	NA	<17	<17	<17	1.3
On-site Well Field, as benzene:	mg/m3 (5)	NA	<0.5	<0.5	<0.5	<0.16
	ppmv (6)	NA	<0.1	<0.2	<0.2	<0.05
Off-site Well Field, as benzene:	mg/m3	NA	closed	closed	<0.5	<0.16
	ppmv	NA	closed	closed	<0.2	<0.05
System Influent, as benzene:	mg/m3	NA	<0.5	<0.5	<0.5	<0.16
	ppmv	NA	<0.1	<0.2	<0.2	<0.05
System Effluent, as benzene:	mg/m3	NA	<0.5	<0.5	<0.5	<0.16
	ppmv	NA	<0.1	<0.2	<0.2	<0.05
On-site Well Field Flow Rate, scfm (7):		NA	82.6	57.3	72.4	71.1
Off-site Well Field Flow Rate, scfm:		NA	closed	closed	10.9	11.0
System Influent Flow Rate, scfm:		NA	82.6	57.3	83.3	82.1
Total Process Flow Rate, scfm:		NA	500	500	500	500
Destruction Efficiency, percent (8):		NA	95.7	100.0	100.0	NA
Emission Rates (pounds per day) (9)						
Gasoline:		NA	<0.45	<0.31	<0.45	0.03
Benzene:		NA	<0.00	<0.00	<0.00	<0.00
Operating Hours This Period:		NA	280.5	792.0	648.0	696.0
Operating Hours To Date:		NA	280.5	1072.5	1720.5	2416.5
Pounds/ Hour Removal Rate, as gasoline (10):		NA	0.036	0.013	0.019	0.001
Pounds Removed This Period, as gasoline (11):		NA	10.0	10.2	12.1	0.8
Pounds Removed To Date, as gasoline (12):		7666	7676	7686	7698	7699
Gallons Removed This Period, as gasoline (13):		NA	1.6	1.6	2.0	0.1
Gallons Removed To Date, as gasoline:		1236	1238	1240	1242	1242

Table 7
Soil-Vapor Extraction System
Operation and Performance Data

Location: 10600 and 10700 MacArthur Boulevard Oakland, California	Vapor Treatment Unit: Anguil Energy Systems Remedi-Cat, 500cfm Catalytic Oxidizer
Consultant: EMCON 1921 Ringwood Avenue San Jose, California	Start-Up Date: 09-06-90 Reporting Period From: 09-06-90 To: 04-11-95

CURRENT REPORTING PERIOD:	01-12-95	to	04-11-95
DAYS / HOURS IN PERIOD:	89.0	2136.0	
DAYS / HOURS OF OPERATION:	89.0	2136.0	
DAYS / HOURS OF DOWN TIME:	0.0	0.0	
PERCENT OPERATIONAL:		100.0	%
PERIOD POUNDS REMOVED:	23.1		
PERIOD GALLONS REMOVED:	3.7		
AVERAGE SYSTEM INFLUENT FLOW RATE (scfm):		73.3	

1. mg/m3: milligrams per cubic meter
2. concentration (as gasoline in mg/m3) = [concentration (as gasoline in ppmv) x 87 lb/lb-mole / 24.05 (lb/m3/lb-mole of air)/mg]
3. ppmv: parts per million by volume
4. concentration (as gasoline in ppmv) = [concentration (as gasoline in mg/m3) x 24.05 (lb/m3/lb-mole of air)/mg] / 87 lb/lb-mole
5. concentration (as benzene in mg/m3) = [concentration (as benzene in ppmv) x 78 lb/lb-mole / 24.05 (lb/m3/lb-mole of air)/mg]
6. concentration (as benzene in ppmv) = [concentration (as benzene in mg/m3) x 24.05 (lb/m3/lb-mole of air)/mg] / 78 lb/lb-mole
7. scfm: flow in standard cubic feet per minute at one atmosphere and 70 degrees Farenheit
8. destruction efficiency, percent = ([system influent concentration (as gasoline in mg/m3) - system effluent concentration (as gasoline in mg/m3)] / system influent concentration (as gasoline in mg/m3)) x 100 percent
9. emission rates (pounds per day) = system effluent concentration (as gasoline or benzene in mg/m3) x system influent flow rate (scfm) x 0.02832 m3/ft3 x 1440 minutes/day x 1 pound/454,000 mg
10. pounds/ hour removal rate (as gasoline) = system influent concentration (as gasoline in mg/m3) x system influent flow rate (scfm) x 0.02832 m3/ft3 x 60 minutes/hour x 1 pound/454,000 mg
11. pounds removed this period (as gasoline) = pounds/ hour removal rate x hours of operation
12. Pounds removed data for the period from September 6, 1990 through December 22, 1994, were reported by EVAX, PEG, and RESNA. Please refer to *Fourth Quarter 1994 Groundwater Monitoring Results and Remediation System Performance Evaluation Report, EMCON March 1995,* for additioanl data for system operation before December 1994.
13. gallons removed this period (as gasoline) = pounds removed this period (as gasoline) x 0.1613 gallons/pound of gasoline
14. The existing catalytic oxidation unit was used as the off-gas abatement device for the site, with the exception of the period from September 6, 1990 to March 21, 1991, when EVAX used an internal combustion engine as the abatement device.
15. NA: not analyzed, not available, or not applicable

Table 8
Soil-Vapor Extraction System
Field Vapor Monitoring Results and Destruction Efficiencies

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Field Date	Field Vapor Monitoring Results (1)				Destruction Efficiency (2)
	On-Site Well Field (I-1)	Off-Site Well Field (Off Site)	Total System Influent (I-2)	System Effluent (E-1)	
	ppmv (3)	ppmv	ppmv	ppmv	percent
12/22/94	24.6	closed	24.6	2.1	91.5
01/05/95	20.9	closed	20.9	1.3	93.8
01/31/95	0.2	closed	0.2	0.0	100.0
02/09/95	0.2	closed	0.2	0.0	100.0
03/03/95	0.2	0.2	0.3	0.5	-66.7 (4)
03/27/95	0.9	0.0	0.5	0.0	100.0
04/14/95	1.2	0.1	1.0	0.1	90.0

1 Concentrations are reported in ppmv as measured by a flame-ionization detector (FID).
2. destruction efficiency (percent) = [(I-2 - E-1) / I-2] * 100
3. ppmv: parts per million by volume
4. The system was in compliance with permit conditions despite the negative destruction efficiency because laboratory analytical results for system influent and effluent air samples collected between February 14 and March 13, 1995, indicate nondetectable levels of TVHG (gasoline) and benzene (i.e., no emissions).

Table 9
Soil-Vapor Extraction Well Data

10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Date	Well Identification											
	VW-1			VW-2			VW-3			VW-4		
	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O
12-22-94	open	<15 LAB	13.1	open	68 LAB	13.0	open	28 LAB	12.0	open	<15 LAB	13.1
01-17-95	closed	NA	NA	open	NA	NA	open	NA	NA	closed	NA	NA
02-16-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA
03-27-95	open	NA	NA	open	NA	NA	open	NA	NA	open	NA	NA

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

Table 9
Soil-Vapor Extraction Well Data

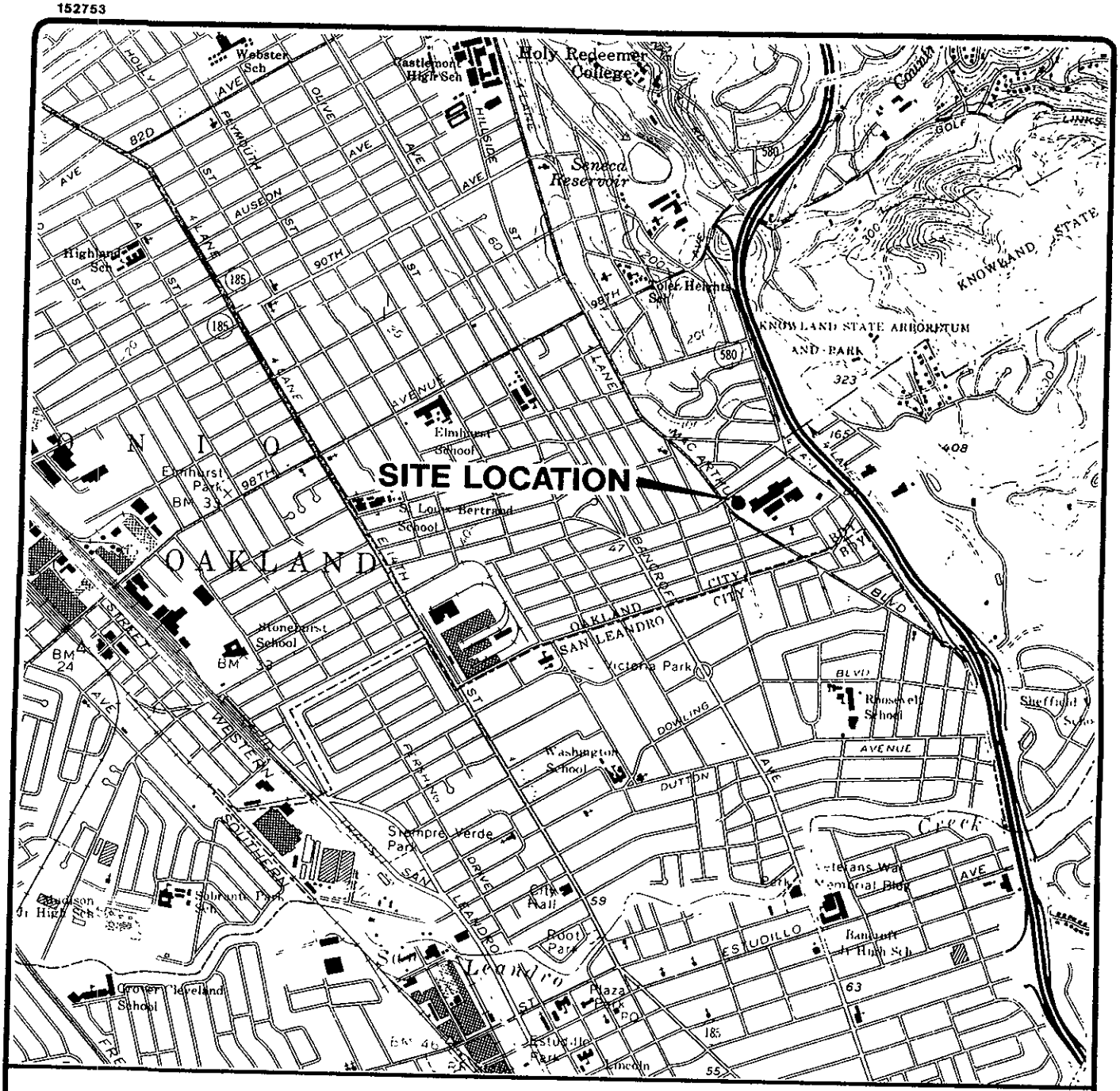
10600 and 10700 MacArthur Boulevard
Oakland, California

Date: 06-30-95
Project Number: 0805-120.04

Date	Well Identification											
	VW-5			VW-7			MW-2					
	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O	Valve Position	TVHG ppmv	Vacuum Response in-H2O
12-22-94	open	<15 LAB	13.0	open	<15 LAB	13.1	open	<15 LAB	7.0			
01-17-95	closed	NA	NA	closed	NA	NA	open	NA	NA			
02-16-95	open	NA	NA	open	NA	NA	open	NA	NA			
03-27-95	open	NA	NA	open	NA	NA	open	NA	NA			

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

152753



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

N

Scale : 0 2000 4000 Feet

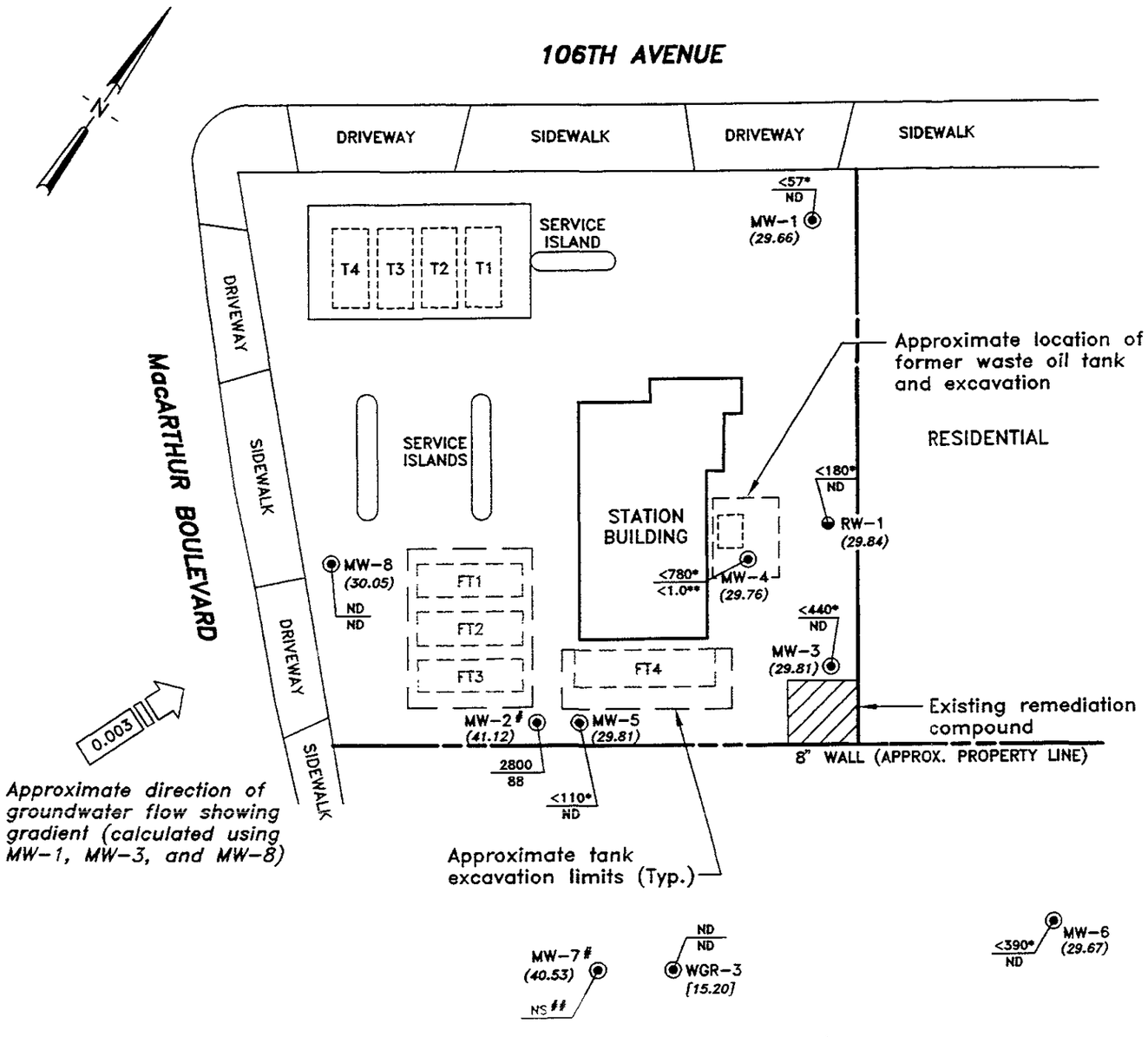
EMCON

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

SITE LOCATION

FIGURE
1

PROJECT NO.
805-120.04



EXPLANATION

- ◉ Groundwater monitoring well
- ◒ Recovery well
- ▭ Existing underground storage tank
- ▭ Former underground storage tank
- *(29.66)* Groundwater elevation (Ft.–MSL); measured 3/10/95
- *[15.20]* Depth to water measured on 3/10/95 (top of casing elevation not available)
- <180* / ND — TPHG concentration in groundwater (µg/L); sampled 3/10 – 3/11/95; Benzene concentration in groundwater (µg/L); sampled 3/10 – 3/11/95
- * Raised method reporting limit due to matrix interference
- ** Raised method reporting limit due to matrix interference requiring sample dilution
- # Well screened in shallow water–bearing zone; not used in contouring
- ## Floating product entered the well during purging
- NS Not sampled

EMCON

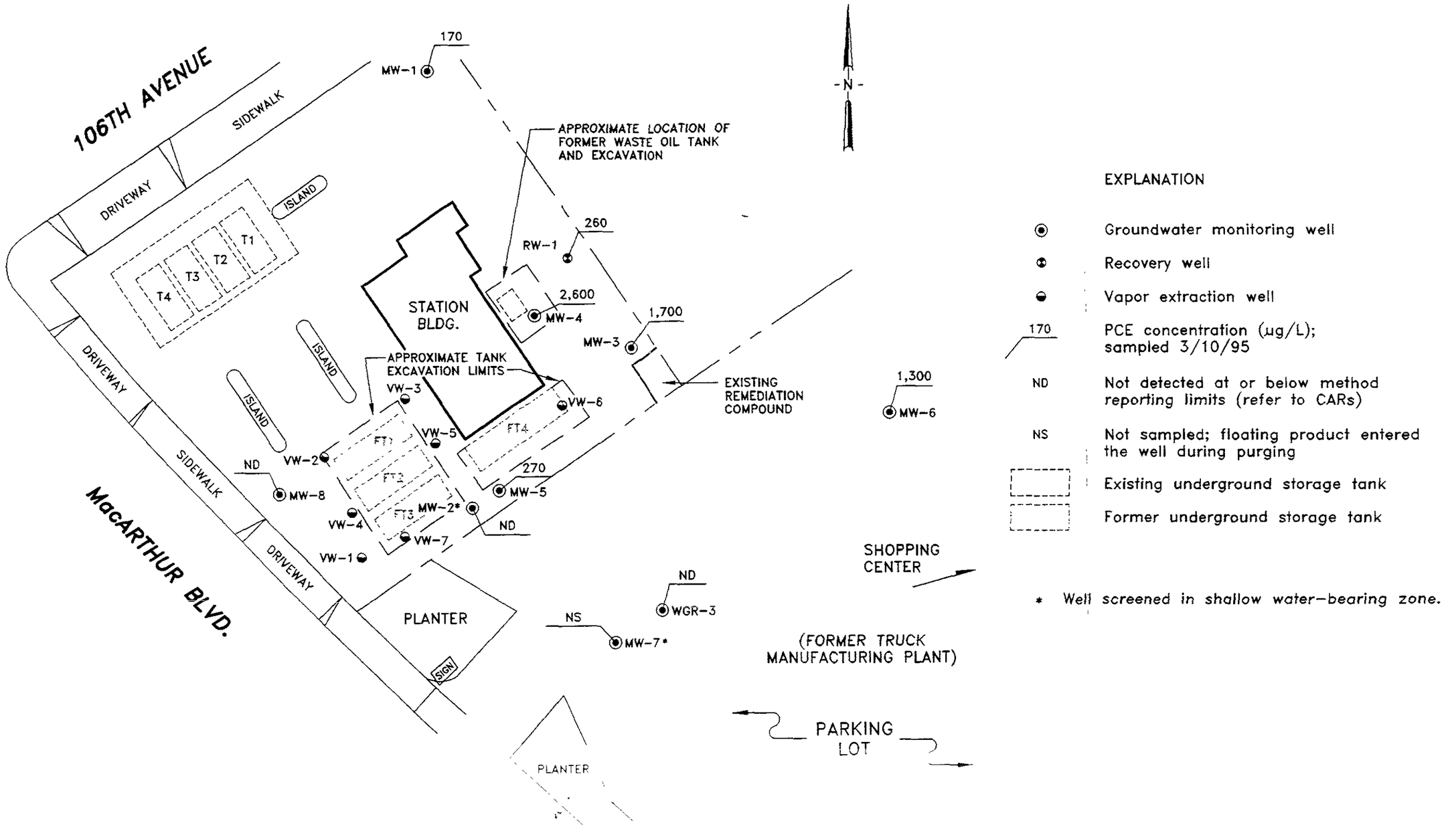
SCALE: 0 30 60 FEET

0600 AND 10700 MACARTHUR BLVD.
QUARTERLY GROUNDWATER MONITORING
OAKLAND, CALIFORNIA

GROUNDWATER DATA
FIRST QUARTER 1995

FIGURE NO. 2

PROJECT NO. 805–120.04



EXPLANATION

- ⊙ Groundwater monitoring well
- ⊙ Recovery well
- ◒ Vapor extraction well
- 170 PCE concentration (µg/L); sampled 3/10/95
- ND Not detected at or below method reporting limits (refer to CARs)
- NS Not sampled; floating product entered the well during purging
- Existing underground storage tank
- Former underground storage tank

* Well screened in shallow water-bearing zone.

Base map modified from RESNA, 1993

emcon

SCALE: 0 30 60 FEET

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

TETRACHLOROETHENE (PCE) CONCENTRATIONS IN GROUNDWATER
FIRST QUARTER 1995

FIGURE 3

PROJECT NO. 805-120.04

APPENDIX A

FIELD DATA SHEETS, FIRST QUARTER 1995 GROUNDWATER MONITORING EVENT

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 1775-202.01 STATION ADDRESS : 10600 MacArthur Blvd. DATE : 3-10 95

ARCO STATION # : 276 FIELD TECHNICIAN : WILLIAMS / GAMBELIN DAY : FRIDAY

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
1	VW-1	NA	VAULT	NA	NONE	GAGE	13.36	13.36	NA	NA	NA	
2	VW-2		VAULT		NONE	GAGE	DRY	DRY	NA	NA	NA	
3	VW-3		VAULT		NONE	GAGE	10.48	10.48	NA	NA	NA	
4	VW-4		VAULT		NONE	GAGE	12.29	12.29	NA	NA	NA	
5	VW-5		VAULT		NONE	GAGE	10.53	10.53	NA	NA	NA	
6	VW-6		VAULT		NONE	GAGE	DRY	DRY	NA	NA	NA	
7	VW-7		VAULT		NONE	GAGE	13.47	13.47	NA	NA	NA	Full of water
8	MW-5	ok	Hex	ok	3499	ok	25.62	25.62	ND	ND	46.7	
9	MW-8	NA	VAULT	NA	NONE	SLIP	23.60	23.60	ND	ND	47.5	
10	MW-1	OK	Hex	OK	3499	ok	26.26	26.26	ND	ND	38.8	
11	RW-1	NA	VAULT	NA	NONE	SLIP	26.48	26.48	sheen	sheen	48.6	CAP CRACKED, water in box
12	MW-3	ok	9/16	OK	ARCO	ok	26.74	26.74	ND	ND	35.5	Box full of water
13	MW-4	ok	9/16	OK	ARCO	OK	26.22	26.22	ND	ND	48.0	
14	MW-6	OK	15/16	OK	ARCO	OK	31.54	31.54	ND	ND	54.1	

SURVEY POINTS ARE TOP OF WELL CASINGS

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 1775-202.01 STATION ADDRESS : 10600 MacArthur Blvd. DATE : 3-10-95

ARCO STATION # : 276 FIELD TECHNICIAN : Williams/Gambelin DAY : Friday

DTW Order	WELL ID	Well Box Seal	Well Lid Secure	Gasket	Lock	Locking Well Cap	FIRST DEPTH TO WATER (feet)	SECOND DEPTH TO WATER (feet)	DEPTH TO FLOATING PRODUCT (feet)	FLOATING PRODUCT THICKNESS (feet)	WELL TOTAL DEPTH (feet)	COMMENTS
15	WGR-3	OK	yes	NA	Arco	yes	15.20	15.20	ND	ND	24.8	Negative pressure in well
16	MW-2	~~OK~~	Vault	NA	NONE	NA	13.98	13.98	ND	ND	25.4	
17	MW-7	OK	yes	yes	yes	yes	17.69	17.~~9~~69	ND*	NA	37.0	water in box above TOC
												* Product was not detected in water level, but as well was purged, product came in.

SURVEY POINTS ARE TOP OF WELL CASINGS

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202-01 SAMPLE ID: MW-1

PURGED BY: J WILLIAMS CLIENT NAME: ARCO 276

SAMPLED BY: J WILLIAMS LOCATION: OAKLAND, CA

TYPE: Ground Water ✓ Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ✓ 3 ___ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR .49 VOLUME IN CASING (gal.): 2.04

DEPTH TO WATER (feet): 26.26 CALCULATED PURGE (gal.): 6.14

DEPTH OF WELL (feet): 38.8 ACTUAL PURGE VOL. (gal.): 6.0

DATE PURGED: 03-10-95 Start (2400 Hr) 1525 End (2400 Hr) 1531

DATE SAMPLED: 03-10-95 Start (2400 Hr) ___ End (2400 Hr) 1535

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1524	2	6.42	269	64.9	BROWN	MOD
1529	4	6.41	272	66.3	BROWN	HEAVY
1531	6	6.47	266	66.7	BROWN	HEAVY

D. O. (ppm): ___ ODOR: ND

COLOR (visual): NR (COBALT 0 - 500)

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

Field QC samples collected at this well: FB-1

Parameters field filtered at this well: NA

PURGING EQUIPMENT

- ___ 2" Bladder Pump
- ___ Centrifugal Pump
- ___ Submersible Pump
- ___ Well Wizard™
- ___ Bailer (Teflon®)
- ✓ Bailer (PVC)
- ___ Bailer (Stainless Steel)
- ___ Dedicated

Other: ___

SAMPLING EQUIPMENT

- ___ 2" Bladder Pump
- ___ DDL Sampler
- ___ Dipper
- ___ Well Wizard™
- ✓ Bailer (Teflon®)
- ___ Bailer (Stainless Steel)
- ___ Submersible Pump
- ___ Dedicated

Other: ___

WELL INTEGRITY: OK LOCK #: ARCO

REMARKS: ___

Meter Calibration: Date: 3-10-95 Time: ___ Meter Serial #: 9010 Temperature °F: ___

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

Location of previous calibration: MW-5

Signature: [signature] Reviewed By: JB Page 1 of 10

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: MW-2

PURGED BY: J. WILLIAMS CLIENT NAME: ARCO 276

SAMPLED BY: J. WILLIAMS LOCATION: OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	8.15
DEPTH TO WATER (feet):	12.92	CALCULATED PURGE (gal.):	24.4
DEPTH OF WELL (feet):	25.4	ACTUAL PURGE VOL. (gal.):	25.0

DATE PURGED: 3-11-95 Start (2400 Hr) 1455 End (2400 Hr) 1510

DATE SAMPLED: 3-11-95 Start (2400 Hr) 1515 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1500	0.0	6.58	331	64.2	CLEAR	LIGHT
1505	16.0	6.50	356	66.0	CLEAR	LIGHT
1510	25.0	6.46	347	64.9	CLEAR	LIGHT

D. O. (ppm): NR ODOR: Moderate

COLOR: NR (COBALT 0 - 500)

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

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Lid impossible to open took 15 minutes alone. LOCK #: NA

REMARKS: ___

Meter Calibration: Date: 3-11-95 Time: ___ Meter Serial #: 9010 Temperature °F: ___

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

Location of previous calibration: MW-3

Signature: [signature] for JW. Reviewed By: JB Page 2 of 10

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: MW-3

PURGED BY: J. WILLIAMS CLIENT NAME: ARCO 276

SAMPLED BY: J. WILLIAMS LOCATION: OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 X 3 ___ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 1.9

DEPTH TO WATER (feet): 26.62 CALCULATED PURGE (gal.): 5.82

DEPTH OF WELL (feet): 38.5 ACTUAL PURGE VOL. (gal.): 6.0

DATE PURGED: 3-11-95 Start (2400 Hr) 1248 End (2400 Hr) 1254

DATE SAMPLED: 3-11-95 Start (2400 Hr) 1256 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1250	2.0	6.59	1730	67.6	BROWN	HEAVY
1252	4.0	6.61	1719	67.3	BROWN	HEAVY
1254	6.0	6.60	1689	67.3	BROWN	HEAVY

D. O. (ppm): NR ODOR: None COLOR: NR (COBALT 0 - 500) TURBIDITY: NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Fine LOCK #: ARCO

REMARKS: ___

Meter Calibration: Date: 3-11-95 Time: 1235 Meter Serial #: 9010 Temperature °F: 71.3

(EC 1000 1000 / 1000) (DI ___) (pH 7 700 / 700) (pH 10 998 / 1000) (pH 4 400 / ___)

Location of previous calibration: ___

Signature: J Butler for T.N. Reviewed By: JB Page 3 of 10

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: MW-4
PURGED BY: JWILLIAMS CLIENT NAME: ARCO 276
SAMPLED BY: JWILLIAMS LOCATION: OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 X 3 ___ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 3.6
DEPTH TO WATER (feet): 26.04 CALCULATED PURGE (gal.): 10.7
DEPTH OF WELL (feet): 48.0 ACTUAL PURGE VOL. (gal.): 11.0

DATE PURGED: 3-11-95 Start (2400 Hr) 1305 End (2400 Hr) 1315
DATE SAMPLED: 3-11-95 Start (2400 Hr) 1320 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1307	3.5	6.87	2150	67.1	BROWN	MOD
1310	7.0	6.77	2,151	67.1	BROWN	MOD
1315	11.0	6.76	2,150	67.0	BROWN	MOD

D. O. (ppm): NR ODOR: NONE COLOR: NR (COBALT 0 - 500) TURBIDITY: NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: (EPA 418.1)

Parameters field filtered at this well: NR

PURGING EQUIPMENT

- ___ 2" Bladder Pump
- ___ Centrifugal Pump
- ___ Submersible Pump
- ___ Well Wizard™
- ___ Bailer (Teflon®)
- X Bailer (PVC)
- ___ Bailer (Stainless Steel)
- ___ Dedicated
- Other: ___

SAMPLING EQUIPMENT

- ___ 2" Bladder Pump
- ___ DDL Sampler
- ___ Dipper
- ___ Well Wizard™
- X Bailer (Teflon®)
- ___ Bailer (Stainless Steel)
- ___ Submersible Pump
- ___ Dedicated
- Other: ___

WELL INTEGRITY: Good LOCK #: ARCO

REMARKS: ___

Meter Calibration: Date: 3/11/95 Time: ___ Meter Serial #: 9010 Temperature °F: ___

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

Location of previous calibration: MW-3

Signature: JButers for J.W Reviewed By: JB Page 4 of 10

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: MW-5

PURGED BY: J. WILLIAMS CLIENT NAME: ARCO 276

SAMPLED BY: J. WILLIAMS LOCATION: OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	13.77
DEPTH TO WATER (feet):	25.62	CALCULATED PURGE (gal.):	41.32
DEPTH OF WELL (feet):	46.7	ACTUAL PURGE VOL. (gal.):	42.0

DATE PURGED: 3-10-95 Start (2400 Hr) 1335 End (2400 Hr) 1350

DATE SAMPLED: 3-10-95 Start (2400 Hr) — End (2400 Hr) 1355

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1341	14	6.34	712	68.0	CLEAR	CLEAR
1346	28	6.35	734	68.5	↓	↓
1350	42	6.36	752	68.0		

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

COLOR (COBALT 0 - 500): NR

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

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
X Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good LOCK #: —

REMARKS: ___

Meter Calibration: Date: 3-10-95 Time: ___ Meter Serial #: 9010 Temperature °F: 69.4

(EC 1000 1000 / 1000) (DI ___) (pH 7 702 / 700) (pH 10 1004 / 1000) (pH 4 4.03 / —)

Location of previous calibration: NA

Signature: [signature] for JW Reviewed By: [signature] Page 5 of 10

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WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: MW-6
PURGED BY: J. WILLIAMS CLIENT NAME: ARCO 276
SAMPLED BY: J. WILLIAMS LOCATION: OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 X 3 ___ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 3.7
DEPTH TO WATER (feet): 31.44 CALCULATED PURGE (gal.): 11.10
DEPTH OF WELL (feet): 54.1 ACTUAL PURGE VOL. (gal.): 11.5

DATE PURGED: 3-11-95 Start (2400 Hr) 1345 End (2400 Hr) 1358
DATE SAMPLED: 3-11-95 Start (2400 Hr) 1400 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1350	3.5	6.84	1910	68.6	Brown	Heavy
1354	8.0	6.92	1796	67.2	Brown	Heavy
1358	11.5	6.92	1834	66.8	Brown	Heavy

D. O. (ppm): NR ODOR: None COLOR: NR (COBALT 0 - 500) TURBIDITY: NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT

___ 2" Bladder Pump
___ Centrifugal Pump
___ Submersible Pump
___ Well Wizard™
___ Bailer (Teflon®)
X Bailer (PVC)
___ Bailer (Stainless Steel)
___ Dedicated
Other: ___

SAMPLING EQUIPMENT

___ 2" Bladder Pump
___ DDL Sampler
___ Dipper
___ Well Wizard™
X Bailer (Teflon®)
___ Bailer (Stainless Steel)
___ Submersible Pump
___ Dedicated
Other: ___

WELL INTEGRITY: Fine LOCK #: ARCO

REMARKS: ___

Meter Calibration: Date: 3-11-95 Time: ___ Meter Serial #: 9010 Temperature °F: ___

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

Location of previous calibration: MW-3

Signature: J. Burton for JN. Reviewed By: JB Page 6 of 10

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: MW-7

PURGED BY: J. WILLIAMS CLIENT NAME: ARCO 276

SAMPLED BY: J. WILLIAMS LOCATION: OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 X 3 ___ 4 ___ 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 3.3

DEPTH TO WATER (feet): 16.67 CALCULATED PURGE (gal.): 9.96

DEPTH OF WELL (feet): ~~37.65~~ ACTUAL PURGE VOL. (gal.): 10.0

DATE PURGED: 3-11-95 Start (2400 Hr) 1435 End (2400 Hr) NA

DATE SAMPLED: 3-11-95 Start (2400 Hr) NA End (2400 Hr) NA

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1435	3.5					
	~~7.0~~	Product in well	no sample taken			
	10.0					

D. O. (ppm): NR ODOR: ___ NR (COBALT 0 - 500) NR (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: Good (water in box) seal was dirty so cleaned it. LOCK #: ARCO

REMARKS: Product came in as first casing volume was being bailed. No sample was taken from this well.

Meter Calibration: Date: 3-11-95 Time: ___ Meter Serial #: 9010 Temperature °F: ___

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

Location of previous calibration: MW-3

Signature: J Butler for JW Reviewed By: JB Page 7 of 10

16.67 37.0

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: MW-8

PURGED BY: JWILLIAMS CLIENT NAME: ARCO 276

SAMPLED BY: JWILLIAMS LOCATION: OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL):	NR	VOLUME IN CASING (gal.):	15.61
DEPTH TO WATER (feet):	23.60	CALCULATED PURGE (gal.):	46.84
DEPTH OF WELL (feet):	42.5	ACTUAL PURGE VOL. (gal.):	47.0

DATE PURGED: 3-10-95 Start (2400 Hr) 1427 End (2400 Hr) 1438

DATE SAMPLED: 3-10-95 Start (2400 Hr) ___ End (2400 Hr) 1445

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1427	15.5	6.50	521	68.0	CLEAR	CLEAR
1432	31	6.48	514	69.1	CLEAR	TRACE
1438	47	6.52	520	69.1	CLEAR	TRACE

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

COLOR (visual): NR (COBALT 0 - 500)

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

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
X Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: ARCO

REMARKS: ___

Meter Calibration: Date: 3-10-95 Time: ___ Meter Serial #: 9010 Temperature °F: ___

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

Location of previous calibration: MW-5

Signature: JBurton for J.W. Reviewed By: JB Page 8 of 10

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WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: WGR-3
PURGED BY: J. WILLIAMS CLIENT NAME: ARCO 276
SAMPLED BY: J. WILLIAMS LOCATION: OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 X 4.5 ___ 6 ___ Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 8.3
DEPTH TO WATER (feet): 14.02 CALCULATED PURGE (gal.): 25.0
DEPTH OF WELL (feet): 26.8 ACTUAL PURGE VOL. (gal.): 18.0

DATE PURGED: 3-11-95 Start (2400 Hr) 1408 End (2400 Hr) 1420
DATE SAMPLED: 3-11-95 Start (2400 Hr) 1430 End (2400 Hr) -

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1414	8.5	6.51	276	66.3	GREY	MOD
1418	17.0	6.38	266	66.9	GREY	MOD
	~~25.0~~	well dried at 18.0 gallons				
1430	Recharge	6.42	263	66.8	GREY	MOD

D. O. (ppm): NR ODOR: Moderate

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

Field QC samples collected at this well: NR
Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	X Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
___ Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: well under negative pressure (vacuum) LOCK #: ARCO

REMARKS: odor & sheen on purge water. Samples taken well dried at 18.0 gallons. Allowed 10 minutes for recharge and took sample.

Meter Calibration: Date: 3-11-95 Time: ___ Meter Serial #: 9010 Temperature °F: ___

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

Location of previous calibration: MW-3

Signature: J. Butler for J.W. Reviewed By: JB Page 9 of 10

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-202.01 SAMPLE ID: RW-1

PURGED BY: J. WILLIAMS CLIENT NAME: ARCO 276

SAMPLED BY: J. WILLIAMS LOCATION: OAKLAND, CA

TYPE: Ground Water X Surface Water ___ Treatment Effluent ___ Other ___

CASING DIAMETER (inches): 2 ___ 3 ___ 4 ___ 4.5 ___ 6 X Other ___

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 32.51

DEPTH TO WATER (feet): 26.48 CALCULATED PURGE (gal.): 97.54

DEPTH OF WELL (feet): 48.6 ACTUAL PURGE VOL. (gal.): 98.0

DATE PURGED: 3-10-95 Start (2400 Hr) 1506 End (2400 Hr) 1535

DATE SAMPLED: 3-10-95 Start (2400 Hr) 1540 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1516	33	6.99	662	61.8	CLEAR	TRACE
1525	66	6.92	888	63.9	CLEAR	CLEAR
1535	98	6.94	927	64.5	CLEAR	CLEAR

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

COLOR (COBALT 0 - 500): NR

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

Field QC samples collected at this well: NR

Parameters field filtered at this well: NR

PURGING EQUIPMENT		SAMPLING EQUIPMENT	
___ 2" Bladder Pump	___ Bailer (Teflon®)	___ 2" Bladder Pump	X Bailer (Teflon®)
___ Centrifugal Pump	___ Bailer (PVC)	___ DDL Sampler	___ Bailer (Stainless Steel)
X Submersible Pump	___ Bailer (Stainless Steel)	___ Dipper	___ Submersible Pump
___ Well Wizard™	___ Dedicated	___ Well Wizard™	___ Dedicated
Other: ___		Other: ___	

WELL INTEGRITY: OK LOCK #: NA

REMARKS: ___

Meter Calibration: Date: 3-10-95 Time: ___ Meter Serial #: 9010 Temperature °F: ___

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

Location of previous calibration: ___

Signature: [signature] for J.W. Reviewed By: [signature] Page 10 of 10

APPENDIX B

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

ARCO 276

Columbia Analytical Services, Inc.

March 27, 1995 Service Request No. S950300

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

Re: **ARCO Facility No. 276 / ~~1775-202.01~~** 20805-120.004

Dear Mr. Young:

Attached are the results of the water sample(s) submitted to our lab on March 13, 1995. For your reference, these analyses have been assigned our service request number S950300.

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.

Steven L. Green
Project Chemist

Annelise J. Bazar
Regional QA Coordinator

SLG/ajb

001

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
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
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
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
tr	Trace level is the concentration of an analyte that is less than the PQL, but greater than or equal to the MDL

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S950300
Project:	ARCO Facility No. 276 / EMCON Project No. 1775-202.01	**Date Collected:**	3/10,11/95
Sample Matrix:	Water	**Date Received:**	3/14/95
		Date Extracted:	NA
		Date Analyzed:	3/21,22/95

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

Analyte:	**TPH as Gasoline**	**Benzene**	**Toluene**	**Ethyl-benzene**	**Xylenes, Total**
Units:	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
Method Reporting Limit:	50	0.5	0.5	0.5	0.5
Sample Name	**Lab Code**				
MW-1 (38)	S950300-001	<57 *	ND	ND	ND	ND
MW-2 (24)	S950300-002	2,800	88	12	16	200
MW-3 (37)	S950300-003	<440 *	ND	ND	ND	0.7
MW-4 (47)	S950300-004	<780 *	<1 **	<1 **	<1 **	1.0
MW-5 (46)	S950300-005	<110 *	ND	ND	ND	ND
MW-6 (53)	S950300-006	<390 *	ND	ND	ND	ND
MW-8 (47)	S950300-007	ND	ND	ND	ND	ND
RW-1 (48)	S950300-008	<180 *	ND	ND	ND	ND
WGR-3 (26)	S950300-009	ND	ND	ND	ND	ND
FB-1	S950300-010	ND	ND	ND	ND	ND
Method Blank	S950321-WB	ND	ND	ND	ND	ND
Method Blank	S950322-WB	ND	ND	ND	ND	ND

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

** Raised MRL due to matrix interference requiring sample dilution.

Approved By: Steven Green Date: 3/27/95

5ABTXGAS/061694

003

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Facility No. 276 / EMCON Project No. 1775-202.01
Sample Matrix: Water

Service Request: S950300
Date Collected: 3/10,11/95
Date Received: 3/14/95
Date Extracted: NA

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

	Sample Name:	MW-1 (38)	MW-2 (24)	MW-3 (37) *
	Lab Code:	S950300-001	S950300-002	S950300-003
	Date Analyzed:	3/20/95	3/22/95	3/21/95
Analyte	**MRL**			
Chloromethane	10	ND	ND	<100
Vinyl Chloride	10	ND	ND	<100
Bromomethane	10	ND	ND	<100
Chloroethane	10	ND	ND	<100
Trichlorofluoromethane (CFC 11)	1	ND	ND	<10
Trichlorotrifluoroethane (CFC 113)	10	ND	ND	<100
1,1-Dichloroethene	1	ND	ND	<10
Acetone	20	ND	ND	<200
Carbon Disulfide	1	ND	ND	<10
Methylene Chloride	10	ND	ND	<100
trans-1,2-Dichloroethene	1	ND	ND	<10
cis-1,2-Dichloroethene	1	ND	ND	<10
2-Butanone (MEK)	10	ND	ND	<100
1,1-Dichloroethane	1	ND	ND	<10
Chloroform	1	ND	ND	<10
1,1,1-Trichloroethane (TCA)	1	ND	ND	<10
Carbon Tetrachloride	1	ND	ND	<10
Benzene	1	ND	110	<10
1,2-Dichloroethane	1	ND	ND	<10
Vinyl Acetate	10	ND	ND	<100
Trichloroethene (TCE)	1	ND	ND	<10
1,2-Dichloropropane	1	ND	ND	<10
Bromodichloromethane	1	ND	ND	<10
2-Chloroethyl Vinyl Ether	10	ND	ND	<100
trans-1,3-Dichloropropene	1	ND	ND	<10
4-Methyl-2-pentanone (MIBK)	10	ND	ND	<100
2-Hexanone	10	ND	ND	<100
Toluene	1	ND	12	<10
cis-1,3-Dichloropropene	1	ND	ND	<10
1,1,2-Trichloroethane	1	ND	ND	<10
Tetrachloroethene (PCE)	1	170	ND	1,700
Dibromochloromethane	1	ND	ND	<10
Chlorobenzene	1	ND	ND	<10
Ethylbenzene	1	ND	15	<10
Styrene	1	ND	ND	<10
Total Xylenes	5	ND	240	<50
Bromoform	1	ND	ND	<10
1,1,2,2-Tetrachloroethane	1	ND	ND	<10
1,3-Dichlorobenzene	1	ND	ND	<10
1,4-Dichlorobenzene	1	ND	ND	<10
1,2-Dichlorobenzene	1	ND	ND	<10

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

Approved By: S. Kevin Hsieh Date: 3/27/95

3S44/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Facility No. 276 / EMCON Project No. 1775-202.01
Sample Matrix: Water

Service Request: S950300
Date Collected: 3/10,11/95
Date Received: 3/14/95
Date Extracted: NA

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

		Sample Name:	MW-4 (47) *	MW-5 (46) *	MW-6 (53) *
		Lab Code:	S950300-004	S950300-005	S950300-006
		Date Analyzed:	3/21/95	3/22/95	3/22/95
Analyte	**MRL**				
Chloromethane	10		<200	<50	<200
Vinyl Chloride	10		<200	<50	<200
Bromomethane	10		<200	<50	<200
Chloroethane	10		<200	<50	<200
Trichlorofluoromethane (CFC 11)	1		<20	<5	<20
Trichlorotrifluoroethane (CFC 113)	10		<200	<50	<200
1,1-Dichloroethene	1		<20	<5	<20
Acetone	20		<400	<100	<400
Carbon Disulfide	1		<20	<5	<20
Methylene Chloride	10		<200	<50	<200
trans-1,2-Dichloroethene	1		<20	<5	<20
cis-1,2-Dichloroethene	1		<20	<5	<20
2-Butanone (MEK)	10		<200	<50	<200
1,1-Dichloroethane	1		<20	<5	<20
Chloroform	1		<20	<5	<20
1,1,1-Trichloroethane (TCA)	1		<20	<5	<20
Carbon Tetrachloride	1		<20	<5	<20
Benzene	1		<20	<5	<20
1,2-Dichloroethane	1		<20	<5	<20
Vinyl Acetate	10		<200	<50	<200
Trichloroethene (TCE)	1		<20	<5	<20
1,2-Dichloropropane	1		<20	<5	<20
Bromodichloromethane	1		<20	<5	<20
2-Chloroethyl Vinyl Ether	10		<200	<50	<200
trans-1,3-Dichloropropene	1		<20	<5	<20
4-Methyl-2-pentanone (MIBK)	10		<200	<50	<200
2-Hexanone	10		<200	<50	<200
Toluene	1		<20	<5	<20
cis-1,3-Dichloropropene	1		<20	<5	<20
1,1,2-Trichloroethane	1		<20	<5	<20
Tetrachloroethene (PCE)	1		2,600	270	1,300
Dibromochloromethane	1		<20	<5	<20
Chlorobenzene	1		<20	<5	<20
Ethylbenzene	1		<20	<5	<20
Styrene	1		<20	<5	<20
Total Xylenes	5		<100	<25	<100
Bromoform	1		<20	<5	<20
1,1,2,2-Tetrachloroethane	1		<20	<5	<20
1,3-Dichlorobenzene	1		<20	<5	<20
1,4-Dichlorobenzene	1		<20	<5	<20
1,2-Dichlorobenzene	1		<20	<5	<20

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

Approved By: Steven Green Date: 3/27/95

3S44/060194

005

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Facility No. 276 / EMCON Project No. 1775-202.01
Sample Matrix: Water

Service Request: S950300
Date Collected: 3/10,11/95
Date Received: 3/14/95
Date Extracted: NA

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

	Sample Name:	MW-8 (47)	RW-1 (48) *	WGR-3 (26)
	Lab Code:	S950300-007	S950300-008	S950300-009
	Date Analyzed:	3/21/95	3/21/95	3/21/95
Analyte	**MRL**			
Chloromethane	10	ND	<50	ND
Vinyl Chloride	10	ND	<50	ND
Bromomethane	10	ND	<50	ND
Chloroethane	10	ND	<50	ND
Trichlorofluoromethane (CFC 11)	1	ND	<5	ND
Trichlorotrifluoroethane (CFC 113)	10	ND	<50	ND
1,1-Dichloroethene	1	ND	<5	ND
Acetone	20	ND	<100	ND
Carbon Disulfide	1	ND	<5	ND
Methylene Chloride	10	ND	<50	ND
trans-1,2-Dichloroethene	1	ND	<5	ND
cis-1,2-Dichloroethene	1	ND	<5	ND
2-Butanone (MEK)	10	ND	<50	ND
1,1-Dichloroethane	1	ND	<5	ND
Chloroform	1	ND	<5	ND
1,1,1-Trichloroethane (TCA)	1	ND	<5	ND
Carbon Tetrachloride	1	ND	<5	ND
Benzene	1	ND	<5	ND
1,2-Dichloroethane	1	ND	<5	ND
Vinyl Acetate	10	ND	<50	ND
Trichloroethene (TCE)	1	ND	<5	ND
1,2-Dichloropropane	1	ND	<5	ND
Bromodichloromethane	1	ND	<5	ND
2-Chloroethyl Vinyl Ether	10	ND	<50	ND
trans-1,3-Dichloropropene	1	ND	<5	ND
4-Methyl-2-pentanone (MIBK)	10	ND	<50	ND
2-Hexanone	10	ND	<50	ND
Toluene	1	ND	<5	ND
cis-1,3-Dichloropropene	1	ND	<5	ND
1,1,2-Trichloroethane	1	ND	<5	ND
Tetrachloroethene (PCE)	1	ND	260	ND
Dibromochloromethane	1	ND	<5	ND
Chlorobenzene	1	ND	<5	ND
Ethylbenzene	1	ND	<5	ND
Styrene	1	ND	<5	ND
Total Xylenes	5	ND	<25	ND
Bromoform	1	ND	<5	ND
1,1,2,2-Tetrachloroethane	1	ND	<5	ND
1,3-Dichlorobenzene	1	ND	<5	ND
1,4-Dichlorobenzene	1	ND	<5	ND
1,2-Dichlorobenzene	1	ND	<5	ND

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

Approved By: _____ Date: 3/27/95

3S44/060194

006

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Facility No. 276 / EMCON Project No. 1775-202.01
Sample Matrix: Water

Service Request: S950300
Date Collected: 3/10,11/95
Date Received: 3/14/95
Date Extracted: NA

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

	Sample Name:	FB-1	Method Blank	Method Blank
	Lab Code:	S950300-010	S950320-WB	S950321-WB
	Date Analyzed:	3/21/95	3/20/95	3/21/95
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	ND	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	ND	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: _____ Date: 3/27/95

3S44/060194

007

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON
Project: ARCO Facility No. 276 / EMCON Project No. 1775-202.01
Sample Matrix: Water

Service Request: S950300
Date Collected: 3/10,11/95
Date Received: 3/14/95
Date Extracted: NA

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

	Sample Name:	**Method Blank**
	Lab Code:	S950322-WB
	Date Analyzed:	3/22/95

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

Approved By: _____ Date: 3/27/95

3S44/060194

008

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

RECEIVED APR 4 1995

Client: EMCON Associates
Project: ARCO Products Company / # 1775-202.01
Sample Matrix: Water

Service Request: L951678
Date Collected: 3/11/95
Date Received: 3/15/95
Date Extracted: 3/15/95
Date Analyzed: 3/15/95

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

Sample Name	Lab Code	MRL	Result
MW-4 (47)	L951678-001	0.5	ND
Method Blank	L951678-MB	0.5	ND

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

Approved By: Eydie Schwartz Date: 3/17/95

009

1AMRL/060194
L951678.XLS - 418w 4/3/95

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

APPENDIX A

LABORATORY QC RESULTS

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S950300
Project:	ARCO Facility No. 276 / EMCON Project No. 1775-202.01	**Date Collected:**	3/10,11/95
Sample Matrix:	Water	**Date Received:**	3/14/95
		Date Extracted:	NA
		Date Analyzed:	3/21,22/95

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 (38)	S950300-001	102
MW-2 (24)	S950300-002	103
MW-3 (37)	S950300-003	102
MW-4 (47)	S950300-004	102
MW-5 (46)	S950300-005	97
MW-6 (53)	S950300-006	102
MW-8 (47)	S950300-007	95
RW-1 (48)	S950300-008	102
WGR-3 (26)	S950300-009	99
FB-1	S950300-010	97
MW-1 (38) MS	S950300-001MS	101
MW-1 (38) DMS	S950300-001DMS	103
Method Blank	S950321-WB	97
Method Blank	S950322-WB	98

CAS Acceptance Limits: 69-116

Approved By: _____ Date: 3/27/95

011

SUR1/062994

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Facility No. 276 / EMCON Project No. 1775-202.01

Service Request: S950300
Date Analyzed: 3/21/95

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

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	25.2	101	85-115
Toluene	25	24.2	97	85-115
Ethylbenzene	25	24.5	98	85-115
Xylenes, Total	75	72.3	96	85-115
Gasoline	250	244	98	90-110

Approved By: Steve Green Date: 3/27/95

012

ICV25AL/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S950300
Project:	ARCO Facility No. 276 / EMCON Project No. 1775-202.01	**Date Collected:**	3/10,11/95
Sample Matrix:	Water	**Date Received:**	3/14/95
		Date Extracted:	NA
		Date Analyzed:	3/21/95

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

Sample Name: MW-1 (38)
Lab Code: S950300-001

Analyte	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference
Benzene	25	25	ND	24.9	25.7	100	103	75-135	3
Toluene	25	25	ND	24.0	24.8	96	99	73-136	3
Ethylbenzene	25	25	ND	24.1	24.9	96	100	69-142	3

Approved By: Steven Shen Date: 3/27/95

DMS1S/060194

013

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Facility No. 276 / EMCON Project No. 1775-202.01
Sample Matrix: Water

Service Request: S950300
Date Collected: 3/10,11/95
Date Received: 3/14/95
Date Extracted: NA
Date Analyzed:

Surrogate Recovery Summary
Volatile Organic Compounds
EPA Method 8240

		Percent Recovery		
Sample Name	**Lab Code**	1,2-Dichloroethane-D_4	Toluene-D_8	4-Bromofluorobenzene
MW-1 (38)	S950300-001	92	107	97
MW-2 (24)	S950300-002	93	106	100
MW-3 (37)	S950300-003	93	106	98
MW-4 (47)	S950300-004	92	106	98
MW-5 (46)	S950300-005	95	104	94
MW-6 (53)	S950300-006	96	97	95
MW-8 (47)	S950300-007	95	105	98
RW-1 (48)	S950300-008	95	105	97
WGR-3 (26)	S950300-009	95	105	99
FB-1	S950300-010	94	106	98
MW-2 (24) MS	S950300-002MS	92	104	100
MW-2 (24) DMS	S950300-002DMS	92	107	97
Method Blank	S950320-WB	94	98	98
Method Blank	S950321-WB	92	95	97
Method Blank	S950322-WB	95	107	100
CAS Acceptance Limits:		76-114	88-110	86-115

Approved By: S Lewis Green Date: 3/27/95

SUR3/060194

014

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Facility No. 276 / EMCON Project No. 1775-202.01

Service Request: S950300
Date Analyzed: 2/24/95

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	49.6	99	70-130
Vinyl Chloride	50	49.5	99	70-130
Bromomethane	50	52.5	105	70-130
Chloroethane	50	56.4	113	70-130
Acetone	50	40.5	81	70-130
1,1-Dichloroethene	50	48.5	97	70-130
Carbon Disulfide	50	48.7	97	70-130
Methylene Chloride	50	49.5	99	70-130
trans-1,2-Dichloroethene	50	50.1	100	70-130
cis-1,2-Dichloroethene	50	50.1	100	70-130
1,1-Dichloroethane	50	50.6	101	70-130
Vinyl Acetate	50	50.1	100	70-130
2-Butanone (MEK)	50	45.4	91	70-130
Chloroform	50	50.1	100	70-130
1,1,1-Trichloroethane (TCA)	50	49.5	99	70-130
Carbon Tetrachloride	50	48.6	97	70-130
Benzene	50	61.0	122	70-130
1,2-Dichloroethane	50	48.9	98	70-130
Trichloroethene (TCE)	50	59.4	119	70-130
1,2-Dichloropropane	50	60.2	120	70-130
Bromodichloromethane	50	57.8	116	70-130
2-Chloroethyl Vinyl Ether	50	40.7	81	70-130
2-Hexanone	50	51.6	103	70-130
trans-1,3-Dichloropropene	50	48.5	97	70-130
Toluene	50	62.1	124	70-130
cis-1,3-Dichloropropene	50	61.0	122	70-130
1,1,2-Trichloroethane	50	51.0	102	70-130
Tetrachloroethene (PCE)	50	49.5	99	70-130
Dibromochloromethane	50	50.4	101	70-130
Chlorobenzene	50	51.3	103	70-130
Ethylbenzene	50	53.3	107	70-130
o- Xylene	50	49.0	98	70-130
Styrene	50	48.0	96	70-130
Bromoform	50	63.6	127	70-130
1,1,2,2-Tetrachloroethane	50	52.9	106	70-130

Approved By: Steven Green Date: 3/27/95

015

ICV4I/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S950300
Project:	ARCO Facility No. 276 / EMCON Project No. 1775-202.01	**Date Collected:**	3/10,11/95
Sample Matrix:	Water	**Date Received:**	3/14/95
		Date Extracted:	NA
		Date Analyzed:	3/20/95

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

Sample Name: MW-2 (24)
Lab Code: S950300-002

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
1,1-Dichloroethene	250	250	ND	229	232	92	93	61-145	1
Trichloroethene	250	250	ND	272	275	109	110	71-120	1
Chlorobenzene	250	250	ND	237	237	95	95	75-130	<1
Toluene	250	250	12.2	274	274	105	105	76-125	<1
Benzene	250	250	115	372	369	103	102	76-127	<1

Approved By: _____ Date: 3/27/95

016

DMS1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: ARCO Products Company / # 1775-202.01
LCS Matrix: Water

Service Request: L951678
Date Collected: NA
Date Received: NA
Date Extracted: 3/15/95
Date Analyzed: 3/15/95

Laboratory Control Sample/Duplicate Laboratory Control Sample Summary *
Oil & Grease/Total Recoverable Petroleum Hydrocarbons (TRPH)
EPA Methods 413.2/418.1
Units: mg/L (ppm)

Analyte	True Value		Result		Percent Recovery		CAS Acceptance Limits	Relative Percent Difference
	LCS	DLCS	LCS	DLCS	LCS	DLCS		
O&G/TRPH	2.09	2.09	1.75	1.89	84	90	75-125	8

NA Not Applicable
* Sample quantity was insufficient to perform matrix spike and matrix spike duplicate. Three separate replicate one liter samples are required to analyzed sample and spikes.

Approved By: Eydie Schwartz Date: 3/17/95

017

DLCS/060194
L951678 XLS - genlcs3 4/3/95

Page No.

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. 17075.00

Chain of Custody

ARCO Facility no. 276	City (Facility) OAKLAND	Project manager (Consultant) John Young	Laboratory name CAS
ARCO engineer Michael Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) 453-7300	Fax no. (Consultant) 453-0452	Contract number
Consultant name EMCON	Address (Consultant) 1921 Ringwood Avenue San Jose		

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
MW-1(38)	1			X		X	HCl	3-10	1535		X					X						
MW-2(24)	2			↓		↓	↓	3-11	1515		X					X						
MW-3(37)	3							3-11	1256		X					X						
MW-4(47)	4							3-11	1320		X			X		X						
MW-5(46)	5							3-10	1355		X					X						
MW-6(53)	6							3-11	1400		X					X						
MW-7(—)	NO SAMPLE PRODUCT										X					X						
MW-8(47)	7							3-10	1445		X					X						
RW-1(48)	8							3-10	1541		X					X						
MGR-3(26)	9							3-11	1430		X					X						
FB-1	10			↓		↓	↓	3-10	1525		X					X						

Method of shipment: Sampler will deliver

Special detection Limit/reporting: "Lowest Possible"

Special QA/QC: As Normal

Remarks: Please read attached request for special instructions.

1775-202.01

Lab number: S950300

Turnaround time

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

Condition of sample:		Temperature received:	
Relinquished by sampler: J. Bulera	Date 3-13-95 Time 11:40	Received by: Joanne Brown CASSJ	3/13/95 11:45
Relinquished by: Joanne Brown w/Custody seal	Date 3/14/95 Time 1800	Received by:	
Relinquished by:	Date Time	Received by laboratory	Date Time

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

APC-3292 (2-91)

CAS-L: 418.1 CAS-SJ: 624, G/BTEX

019

File Under: 1775-120.01
ARCO 276

GOLDEN STATE/CAS
LABORATORIES, INC.

March 17, 1995

John Young
EMCON Associates
1921 Ringwood Avenue
San Jose, CA 95131-1721

Re: **ARCO Facility # 276 - Oakland / ~~Project # 1775-202.01~~**

Dear John:

Enclosed are the results of the samples submitted to our lab on March 15, 1995. For your reference, these analyses have been assigned our service request number L951678.

All analyses were performed in accordance with our laboratory's quality assurance program. Golden State / CAS is certified for environmental analyses by the California Department of Health Services (Certificate # 1296/Expiration - August 1996).

Please call if you have any questions.

Respectfully submitted,

Golden State / CAS Laboratories, Inc.

Eydie Schwartz for

Dr. B. Gene Bennett
Laboratory Director

Stuart Sigman
Quality Assurance Coordinator

GB/sjt

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: EMCON Associates
Project: ARCO Products Company / # 1775-202.01
Sample Matrix: Water

Service Request: L951678
Date Collected: 3/11/95
Date Received: 3/15/95
Date Extracted: 3/15/95
Date Analyzed: 3/15/95

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

Sample Name	Lab Code	MRL	Result
MW-4 (47)	L951678-001	0.5	ND
Method Blank	L951678-MB	0.5	ND

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

Approved By: Eydie Schwartz Date: 3/17/95

1AMRL/060194
L951678.XLS - 418w 3/17/95

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON Associates	**Service Request:**	L951678
Project:	ARCO Products Company / # 1775-202.01	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	3/15/95
		Date Analyzed:	3/15/95

Laboratory Control Sample/Duplicate Laboratory Control Sample Summary *
Oil & Grease/Total Recoverable Petroleum Hydrocarbons (TRPH)
EPA Methods 413.2/418.1
Units: mg/L (ppm)

	True Value		Result		Percent Recovery		CAS Acceptance	Relative
Analyte	LCS	DLCS	LCS	DLCS	LCS	DLCS	Limits	**Percent Difference**
O&G/TRPH	2.09	2.09	1.75	1.89	84	90	75-125	8

NA Not Applicable

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

Approved By: Eydie Schwartz Date: 3/17/95

DLCS/060194
L951678.XLS - genlcs3 3/17/95

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ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 17075.00

Chain of Custody

ARCO Facility no. 276	City (Facility) OAKLAND	Project manager (Consultant) John Young	Laboratory name CAS
ARCO engineer Michael Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) 453-7300	Fax no. (Consultant) 453-0452
Consultant name EMCON	Address (Consultant) 1921 Ringwood Avenue San Jose		Contract number

Method of shipment: Sampler will deliver

Special detection Limit/reporting: lowest Possible

Special QA/QC: AS Normal

Remarks: Please read attached request for special instructions.

1775-202.01

Lab number: 595167B 5950300

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

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA 8020/8015/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/modified	EPA 601/8010	EPA 8240	EPA 8260/8270	TCLP Metals ☐ VOA ☐ Semi ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
MW-1(38)				X		X	HCl	3-10	1535		X					X						
MW-2(24)								3-11	1515		X					X						
MW-3(37)								3-11	1256		X					X						
MW-4(47)	595167B -1							3-11	1320		X			X		X						
MW-5(46)	595167B -2							3-10	1355		X					X						
MW-6(53)								3-11	1400		X					X						
MW-7(—) NO SAMPLE PRODUCT											X					X						
MW-8(47)								3-10	1445		X					X						
RW-1(48)								3-10	1541		X					X						
VGP-3(26)								3-11	1430		X					X						
FB-1								3-10	1525		X					X						

Condition of sample: Intact

Temperature received: Cool

Relinquished by sampler	Date 3-13-95	Time 11:40	Received by
Relinquished by	Date 3/14/95	Time 1800	Received by
Relinquished by	Date	Time	Received by laboratory — Date 3-15-95 — Time 0900

w/ Custody Seal

CAS-L: 418.1 CAS-SJ: 624, G/BTEX

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

APPENDIX C

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

RECEIVED

JAN 2 4 1995

GOLDEN STATE/CAS
LABORATORIES, INC.

January 23, 1995

Valli Voraganti
EMCON Associates
1921 Ringwood Avenue
San Jose, CA 95131-1721

Re: **ARCO Facility #276/Project #0805-120.02**

Dear Valli:

Enclosed are the results of the samples submitted to our lab on January 19, 1995. For your reference, these analyses have been assigned our service request number L951143.

All analyses were performed in accordance with our laboratory's quality assurance program. Golden State / CAS is certified for environmental analyses by the California Department of Health Services (Certificate # 1296/Expiration - August 1996).

Please call if you have any questions.

Respectfully submitted,

Golden State / CAS Laboratories, Inc.

Eydie Schwartz for
Dr. B. Gene Bennett
Laboratory Director

Stuart Sigman
Quality Assurance Coordinator

GB/kr

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Service Request:**	L951143
Project:	ARCO Products Company/#0805-120.02	**Date Collected:**	1/17/95
Sample Matrix:	Vapor	**Date Received:**	1/19/95
		Date Extracted:	NA

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

Sample Name:	**I-1**	**E-1**	**Method Blank**
Lab Code:	L951143-001	L951143-002	L951143-MB
Date Analyzed:	1/19/95	1/19/95	1/19/95

Analyte	**MRL**			
Benzene[1]	0.5	ND	ND	ND
Toluene[1]	0.5	ND	ND	ND
Ethylbenzene[2]	0.5	ND	ND	ND
Total Xylenes[2]	1.0	ND	ND	ND
Total Volatile Hydrocarbons**	60	ND	ND	ND
C_1-C_4 Hydrocarbons*	20	ND	ND	ND
C_5-C_8 Hydrocarbons*	20	ND	ND	ND
C_9-C_{12} Hydrocarbons*	20	ND	ND	ND
Total Volatile Hydrocarbons**[a]	60	ND	ND	ND

NA	Not Applicable
1	Benzene and Toluene are included in the C_5-C_8 hydrocarbon fraction.
2	Ethylbenzene and Total Xylenes are included in the C_9-C_{12} hydrocarbon fraction due to the use of C_1-C_8 n-paraffins as the standard for Total Volatile Hydrocarbons.
*	Total Volatile Hydrocarbons quantified using n-paraffins with a range of C_1-C_8.
**	Result is rounded to two significant figures.
a	Gasoline Fraction (C_5-C_{12})
MRL	Method Reporting Limit
ND	None detected at or above the method reporting limit.

Approved By: Cydie Schwartz Date: 1/23/95

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Service Request:**	L951143
Project:	ARCO Products Company/#0805-120.02	**Date Collected:**	1/17/95
Sample Matrix:	Vapor	**Date Received:**	1/19/95
		Date Extracted:	NA

Permanent Gases*
Units: % (v/v)

Sample Name:	**I-1**	**Method Blank**
Lab Code:	L951143-001	L951143-MB
Date Analyzed:	1/19/95	1/19/95

Analyte	**MRL**		
Carbon Dioxide	1	ND	ND
Oxygen	1	22	ND

NA	Not Applicable
*	Analysis performed using gas chromatography with a thermal conductivity detector.
MRL	Method Reporting Limit
ND	None detected at or above the method reporting limit

Approved By: Eydie Schwartz Date: 1/23/95

3S22/060194
L951143.XLS - permgas2 1/23/95

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: ARCO Products Company/#0805-120.02
Sample Matrix: Vapor

Service Request: L951143
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 1/19/95

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

Sample Name: BATCH QC
Lab Code: L951142-002

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.1	74.1	67.9	71.0	9
Toluene	0.1	341	325	333	5
Ethylbenzene	0.1	64.0	62.3	63.2	3
Total Xylenes	0.2	446	423	434	5
Total Volatile Hydrocarbon**	15	5600	6000	5800	7
C_1-C_4 Hydrocarbons*	5	ND	ND	ND	NA
C_5-C_8 Hydrocarbons*	5	4080	4270	4180	5
C_9-C_{12} Hydrocarbons*	5	1570	1690	1630	7

NA Not Applicable
* Total Volatile Hydrocarbons quantified using n-paraffins with a range of C_1-C_8.
** Result is rounded to two significant figures.
MRL Method Reporting Limit
ND None detected at or above the method reporting limit.

Approved By: Eydie Schwartz Date: 1/23/95

L951143 XLS - 8020DA 1/23/95

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: ARCO Products Company/#0805-120.02
Sample Matrix: Vapor

Service Request: L951143
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 1/19/95

Duplicate Summary
Permanent Gases*
% (v/v)

Sample Name: I-1
Lab Code: L951143-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Carbon Dioxide	1	ND	ND	ND	NA
Oxygen	1	22.3	21.3	21.8	5

NA Not Applicable
***** Analysis performed using gas chromatography with a thermal conductivity detector.
MRL Method Reporting Limit
ND None Detected at or above the method reporting limit.

Approved By: Eydie Schwartz Date: 1/23/95

DUP1A/060194
L951143.XLS - prmgsdup 1/23/95

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

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 276-74-5

Chain of Custody

ARCO Facility no. 276	City (Facility) Oakland	Project manager (Consultant) D. Larsen / V. Voraganti	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) 415-571-2449	Telephone no. (Consultant) 408-453-7300	Fax no. (Consultant) 408-453-0452
Consultant name EMCON	Address (Consultant) 1921 Ringwood	San Jose, CA.	Contract number 070777

Sample I.D.	Lab no. (L951143)	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other (Vapor)	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	CO_2 O_2
I-1	1	1			X			1/17/95	1626		X										X
E-1	2	1			X			1/17/95	1622		X										

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

Special QA/QC

Remarks: 0805-120.02

L951143

Lab number: 5950049

Turnaround time

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

Condition of sample:		Temperature received:
Relinquished by sampler	Date 1/18/95 Time 0808	Received by
Relinquished by	Date 1/18/95 Time 1600	Received by
Relinquished by	Date Time	Received by laboratory Date 1/18/95 Time 0809

GS/CAS 1-19-95 0900

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

APPC-3292 (2-91)

Columbia Analytical Services INC.

February 24, 1995 Service Request No. S950148

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

Re: **ARCO Facility No. 276**

Dear Ms. Yelamanchili:

Attached are the results of the vapor sample(s) submitted to our lab on February 9, 1995. For your reference, these analyses have been assigned our service request number S950148.

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.

Steven L. Green
Project Chemist

Annelise J. Bazar
Regional QA Coordinator

SLG/ajb

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

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
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
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
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
tr	Trace level is the concentration of an analyte that is less than the PQL, but greater than or equal to the MDL

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Service Request:**	S950148
Project:	ARCO Facility No. 276 / EMCON Project No. 0805-120.04	**Date Collected:**	2/9/95
Sample Matrix:	Vapor	**Date Received:**	2/9/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3 (ppb)

Sample Name:	**I-1**	**E-1**	**Method Blank**
Lab Code:	S950148-001	S950148-002	S950210-VB
Date Analyzed:	2/10/95	2/10/95	2/10/95

Analyte	**MRL**			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	1	ND	ND	ND
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20	ND	ND	ND
C_5 - C_8 Hydrocarbons	20	ND	ND	ND
C_9 - C_{12} Hydrocarbons	20	ND	ND	ND
Gasoline Fraction (C_5-C_{12})	60	ND	ND	ND

Approved By: _____ Date: 2/24/95

3S22/060194

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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: EMCON Associates
Project: ARCO Facility No. 276 / EMCON Project No. 0805-120.04

Service Request: S950148
Date Analyzed: 2/10/95

Initial Calibration Verification (ICV) Summary
BTEX and Total Volatile Hydrocarbons

Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	16	14.7	91	85-115
Toluene	16	14.2	88	85-115
Ethylbenzene	16	14.2	89	85-115
Xylenes, Total	48	41.0	85	85-115
Gasoline	200	220	110	90-110

Approved By: _____ Date: 2/24/95

ICV25AL/060194

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

QA/QC Report

Client: EMCON Associates
Project: ARCO Facility No. 276 / EMCON Project No. 0805-120.04
Sample Matrix: Vapor

Service Request: S950148
Date Collected: 2/9/95
Date Received: 2/9/95
Date Extracted: NA
Date Analyzed: 2/10/95

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: mg/m^3 (ppb)

Sample Name: Batch QC
Lab Code: S950152-001

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.5	<5	<5	<5	<1
Toluene	0.5	<5	<5	<5	<1
Ethylbenzene	0.5	<5	<5	<5	<1
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	20	<200	<200	<200	<1
C_5 - C_8 Hydrocarbons	20	1,350	1,330	1340	1
C_9 - C_{12} Hydrocarbons	20	<200	<200	<200	<1
Gasoline Fraction (C_5-C_{12})	60	1,370	1,340	1355	2

Approved By: _____ Date: 2/14/95

DUP1S/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. 6.245.2,00

Chain of Custody

ARCO Facility no. 276	City (Facility) Oakland	Project manager (Consultant) Sailaja Yelamanchili	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) 408 377-8697	Telephone no. (Consultant) 408 453 7300	Fax no. (Consultant) 408 453 0452
Consultant name EMCON	Address (Consultant) 1921 Ringwood	San Jose, CA.	Contract number 07077

Method of shipment: Tech.

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other (Vapor)	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
I-1	1	1			X			2-9-95	1536		X											
E-1	2	1			X			2-9-95	1531		X											

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

Special QA/QC

Remarks: 0805-120.04

Lab number: 5950148

Turnaround time

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

Condition of sample:		Temperature received:	
Relinquished by sampler	Date 2-9-95 Time 1805	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory Joan Brown	Date 2-9-95 Time 1806

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

Columbia Analytical Services inc.

March 1, 1995

Service Request No. S950189

Ms. Valli Voruganti
EMCON Associates
1921 Ringwood Avenue
San Jose, CA 95131

Re: **ARCO Facility No. 276 / EMCON Project No. 0805-120.04**

Dear Ms. Voruganti:

Attached are the results of the vapor sample(s) submitted to our lab on February 16, 1995. For your reference, these analyses have been assigned our service request number S950189.

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.

Steven L. Green
Project Chemist

Annelise J. Bazar
Regional QA Coordinator

SLG/ajb

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

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
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
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
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
tr	Trace level is the concentration of an analyte that is less than the PQL, but greater than or equal to the MDL

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Service Request:**	S950189
Project:	ARCO Facility No. 276/EMCON Project No. 0805-120.04	**Date Collected:**	2/16/95
Sample Matrix:	Vapor	**Date Received:**	2/16/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3 (ppb)

Sample Name:	E-1	I-1	Offsite
Lab Code:	S950189-001	S950189-002	S950189-003
Date Analyzed:	2/17/95	2/17/95	2/17/95

Analyte	MRL			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	1	ND	ND	ND
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20	ND	ND	ND
C_5 - C_8 Hydrocarbons	20	ND	ND	ND
C_9 - C_{12} Hydrocarbons	20	ND	ND	ND
Gasoline Fraction (C_5-C_{12})	60	ND	ND	ND

Approved By: _____ Date: 3/1/95

3S22/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON Associates	**Service Request:**	S950189
Project:	ARCO Facility No. 276/EMCON Project No. 0805-120.04	**Date Collected:**	2/16/95
Sample Matrix:	Vapor	**Date Received:**	S/16/95
		Date Extracted:	NA

BTEX and Total Volatile Hydrocarbons

Units: mg/m^3 (ppb)

Sample Name:		**I-2**	**Method Blank**	**Method Blank**
Lab Code:		S950189-004	S950217-VB1	S950222-VB1
Date Analyzed:		2/17/95	2/17/95	2/22/95
Analyte	**MRL**			
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	1	ND	ND	ND
Total Volatile Hydrocarbons				
C_1 - C_4 Hydrocarbons	20	ND	ND	ND
C_5 - C_8 Hydrocarbons	20	ND	ND	ND
C_9 - C_{12} Hydrocarbons	20	ND	ND	ND
Gasoline Fraction (C_5-C_{12})	60	ND	ND	ND

Approved By: Steve Green Date: 3/1/95

3S22/060194

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APPENDIX A

LABORATORY QC RESULTS

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: ARCO Facility No. 276/EMCON Project No. 0805-120.04

Service Request: S950189
Date Analyzed: 2/17/95

Initial Calibration Verification (ICV) Summary
BTEX and Total Volatile Hydrocarbons

Units: ppb

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	16	16.1	101	85-115
Toluene	16	14.9	93	85-115
Ethylbenzene	16	14.4	90	85-115
Xylenes, Total	48	41.2	86	85-115
Gasoline	200	180	90	90-110

Approved By. _____ Date: 3/1/95

ICV25AL/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON Associates
Project: ARCO Facility No. 276/EMCON Project No. 0805-120.04
Sample Matrix: Vapor

Service Request: S950189
Date Collected: 2/16/95
Date Received: 2/16/95
Date Extracted: NA
Date Analyzed: 2/17, 22/95 *

Duplicate Summary
BTEX and Total Volatile Hydrocarbons

Units: mg/m^3 (ppb)

Sample Name: I-2
Lab Code: S950189-004

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference
Benzene	0.5	ND	ND	ND	<1
Toluene	0.5	ND	ND	ND	<1
Ethylbenzene	0.5	ND	ND	ND	<1
Total Volatile Hydrocarbons					
C_1 - C_4 Hydrocarbons	20	ND	ND	ND	<1
C_5 - C_8 Hydrocarbons	20	ND	ND	ND	<1
C_9 - C_{12} Hydrocarbons	20	ND	ND	ND	<1
Gasoline Fraction (C_5-C_{12})	60	ND	ND	ND	<1

* The original analysis of I-2 was performed on February 17, 1995. The duplicate analysis was performed on February 22, 1995 which was past the holding time for the analysis. Because all compounds were non-detected in the sample for both analyses, we believe that the quality of the data was not significantly affected.

Approved By: _____ Date: 3/1/95

DUP1S/060194

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

Division of AtlanticRichfieldCompany

Task Order No. 24520.08

Chain of Custody

Facility 276	City (Facility) Oakland	Project manager (Consultant) V. Voraganti	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) 408 377-8697	Telephone no. (Consultant) 408 453 7300	Fax no. (Consultant) 408 453 0452
Consultant name EMCON	Address (Consultant) 1921 Ringwood San JOSE, CA.		Contract number 07077

Method of shipment: Tech.

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other (Vapor)	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH (gas) EPA M602/8020/8015	TPH Modified 8015 Gas X / Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	TO-14
E-1		2			X			2-16-95	1312			X									X
I-1		1			X			2-16-95	1317		X										
OFF SITE		2			X			2-16-95	1323			X									X
I-2		2			X			2-16-95	1330			X									X

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

Special QA/QC

Remarks: 0805-120.04

Lab number: 9950189

Turnaround time

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

Condition of sample:

Temperature received:

	Date	Time	
Relinquished by sampler	2-16-95	1540	Received by Joanne Brown CAS-SJ
Relinquished by Joanne Brown	2-16-95	1700	Received by
Relinquished by	Date	Time	Received by laboratory / Date / Time

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APPC-3292 (2-91)

TO-14 to PAI / 6/BTEX-G to SJ

ARCO 276 0805-120.04

Performance Analytical Inc.
Air Quality Laboratory

RECEIVED MAR 2 2 1995

LABORATORY REPORT

Client:	EMCON	Date of Report:	03/21/95
Address:	1921 Ringwood Avenue	Date Received:	03/15/95
	San Jose, CA 95131	PAI Project No:	P95-7949
Contact:	Ms. Valli Voraganti	Purchase Order:	Verbal

Project ID: ARCO 276-Oakland #0805-120.04

Four (4) Tedlar Bag Samples labeled:

"I-1" "I-2" "E-1" "Off Site"

The samples were received at the laboratory under chain of custody on March 15, 1995. The samples were received intact. The dates of analysis are indicated on the attached data sheets.

BTEX Analysis

The samples were analyzed for Benzene, Toluene, Ethylbenzene and Total Xylenes according to modified CARB Method 410 using a gas chromatograph equipped with a photoionization detector.

Total Petroleum Hydrocarbons as Gasoline Analysis

The samples were also analyzed for Total Petroleum Hydrocarbons as Gasoline using a gas chromatograph equipped with a flame ionization detector.

The results of analyses are included on the attached data sheets.

Data Release Authorization:

Ku-Jih Chen
Principal Chemist

Reviewed and Approved:

Christopher Casteel
Manager of Technical Operations

20954 Osborne Street, Canoga Park, CA 91304 • Phone 818 709-1139 • Fax 818 709-2915

Performance Analytical Inc.
Air Quality Laboratory

RESULTS OF TOTAL PETROLEUM HYDROCARBON (TPH) ANALYSIS

Client: EMCON

Client Project ID: #2452.00
PAI Project ID: #P957949

Test Code: GC/FID
Instrument ID: HP 5890A/FID #3
Analyst: Ku-Jih Chen
Matrix: Tedlar Bags

Date Sampled: 3/14/95
Date Received: 3/15/95
Date Analyzed: 3/15/95
Volume(s) Analyzed: 1.00 (ml)

Client Sample ID	PAI Sample ID	D.F.	Total Petroleum Hydrocarbons as Gasoline (mg/m3)	
			Result	Detection Limit
I-1	9501497	1.00	4.4	3.6
I-2	9501498	1.00	ND	3.6
E-1	9501499	1.00	4.6	3.6
Off Site	9501500	1.00	4.9	3.6
Off Site	Lab Duplicate	1.00	5.5	3.6
N/A (3/15/95)	Method Blank	1.00	ND	3.6

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified by : SG

Date : 3/21/95

20954 Osborne Street, Canoga Park, CA 91304 • Phone 818 709-1139 • Fax 818 709-2915

Performance Analytical Inc.
Air Quality Laboratory

RESULTS OF ANALYSIS

Client: **EMCON**

Client Project ID: **#2452.00**
PAI Project ID: **#P957949**

Test Code:	Modified CARB 410	Date Sampled:	3/14/95
Analyst:	Wade Henton	Date Received:	3/15/95
Instrument:	HP5890/PID #3	Date Analyzed:	3/15/95
Matrix:	Tedlar Bag	Volume(s) Analyzed:	1.00 (ml)

CLIENT SAMPLE ID	PAI SAMPLE ID	Benzene mg/m3	Toluene mg/m3	Ethylbenzene mg/m3	Total Xylenes mg/m3
I-1	9501497	ND < 0.16	ND < 0.19	ND < 0.22	1.4
I-2	9501498	ND < 0.16	ND < 0.19	ND < 0.22	ND < 0.22
E-1	9501499	ND < 0.16	ND < 0.19	ND < 0.22	0.68
Off Site	9501500	ND < 0.16	ND < 0.19	ND < 0.22	0.67
Off Site	Lab Duplicate	ND < 0.16	ND < 0.19	ND < 0.22	0.68
N/A (3/15/95)	Method Blank	ND < 0.16	ND < 0.19	ND < 0.22	ND < 0.22

TR = Detected Below Indicated Reporting Limit
ND = Not Detected

Verified by: SG

Date: 3/21/95

20954 Osborne Street, Canoga Park, CA 91304 • Phone 818 709-1139 • Fax 818 709-2915

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 2952.00

Chain of Custody

ARCO Facility no. 276	City (Facility) Oakland	Project manager (Consultant) V. Voraganti	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO) 408 377 8697	Telephone no. (Consultant) 408 453 7300	Fax no. (Consultant) 408 453 0452	Contract number 07077
Consultant name EMCON	Address (Consultant) 1921 Ringwood San JOSE, CA.			Method of shipment Tech.

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other (Vapor)	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	
I-1	950-1497	1			X			3-14-95	0951		X										
I-2	950-1498	2			X				0959		X										
E-1	950-1494	1			X				0941		X										
OFFSite	950-1500	1			X				0946		X										

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

Special QA/QC

Remarks: 0805 - 120.04

Lab number: 5950310

Turnaround time
- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days ☐ X

Condition of sample:

Temperature received:

	Date	Time		Date	Time
Relinquished by sampler	3-14-95	1200	Received by		CAS-SJ 3/14/95 1200
Relinquished by w/Custody Seal Joanne Brown CAS-SJ	3-14-95	1800	Received by PAI Kate Aguilera	3/15/95	09:00
Relinquished by	Date	Time	Received by laboratory	Date 3-19-95	Time 12:00

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

APPC-3292 (2-91)

CAS · PAI · GBTEX

APPENDIX D

OPERATION AND MAINTENANCE FIELD DATA SHEETS FOR ON-SITE SVE SYSTEM, FIRST QUARTER 1995

ARCO 276.10600 MacArthur Blvd., C .and . Operation Maintenance Log for 19 EMCON Proj: 805-120.02 94-5

REMARKS: System was running upon arrival to the site. Cleaned compound of leaves. Took PID readings but 3.1 was the low → closed VW-1, VW-4, VW-5, & VW-7 Retook PID readings after ½ hr. Total Flow = 230 cfm Infl. vac = 42.5" wtr Infl flow = 250-275 FPM (4") Infl PID = 2.6 PPM Then took I-1 E-1 samples

Hour meter started at 1703 → zero Unscheduled site visit ☐ or (Scheduled) site visit no. _____ of 14

500 SCFM GAS-FIRED ANGUIL CATALYTIC OXIDIZER (Serial #01169107) 411

Arrival Time (24:00 hour)	1432
System Status (on or off)	ON
Shutdown Time (24:00 hour)	
Alarm Lights on ?	
Restart Time (24:00 hour)	
Reading Time (24:00 hour)	1449
Well Field (I1) (before dilution)	Dilution valve closed
Vacuum (In. of H2O)	18.1
Flow (velocity: ft/min).. (pipe dia. 4")	900 - 950
Temperature (°F)	57

After Blower (system) (I2) (pipe dia. 7")	
Pressure (In. of H2O)	9.8
System Influent Flow (in. of H2O) Pitot	.15
Temperature (°F)	NA
System	
Set Point (°F)	610
Fire Box Temperature (°F)	611
Stack Temperature (°F) (stack dia. 6")	601
Hour Meter Reading OFF chart = 298.2 HRS.	
Gas Meter Reading (cubic feet)	6036
Total Flow to Unit (SCFM)(flow meter)	65
CatOx Amperage	4.2
Blower Amperage	85
Total Main Amperage	19

(System air sampling to be done once every month)

Field monitoring once every 2 weeks (per BAAQMD permit conditions)

PID/FID READINGS (ppm)	I-1	I-2	E-1
Date: 1/17/95	3.1	~~7.1~~	
Date:			

WELL FIELD (do monthly)

Well ID	Well Dia.	Screen interval	Pipe stub up dia	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (inch. water)	Air flow (ft/min)	FID/PID Reading(ppm)
VW-1 (SVE)	4"	8 - 18	2"						
VW-2 (SVE)	4"	8 - 18	2"						
VW-3 (SVE)	4"	8 - 18	2"						
VW-4 (SVE)	4"	9 - 19	2"						
VW-5 (SVE)	4"	8 - 18	2"						
VW-6	4"	9 - 18	N/A						
VW-7 (SVE)	4"	7.5 - 17.5	2"						
MW-1	2"	19 - 39	N/A						
MW-2 (SVE)	2"	15 - 25	2"						
MW-3	2"	20 - 40	N/A						
MW-4	2"	30 - 50	N/A						
MW-5	4"	32 - 58	N/A						
MW-6	2"	?	N/A						
MW-7	2"	20 - 40	N/A						
MW-8	4"	29 - 49	N/A						
RW-1	6"	36 - 51	N/A						

Special Instructions:

Remember to use ARCO chain-of-custody forms. Please include all analytical method numbers, as indicated on the O&M request forms and on the chain-of-custody forms. Request TPHG, BTEX, and benzene results in mg/m3 on the chain-of-custody forms.

Operator: MAdler Date: 1-17-95 **EMCON Project: 0805-122.01 94-5**

EMCON
OPERATION and MAINTENANCE FIELD REPORT

Installed Hour meter for blower. I had to put it inside the switch enclosure. The Fire proof conduting has plugs so I'll be able to move it. I couldn't put it in the CAT ox Panel because of the way the logic is and the wires are run.

Influent air still dry

Changed batteries in auto dialer.

Ordered pens for chart recorder

NAME MAdler

DATE 1/17/94

PROJECT NAME Bladen ARCO 276

PROJECT NUMBER 0805-120.02

REMARKS: System on upon arrival . Tank reading . Took I-1 sample in Summa call for TO-14 per Sai. Installed KO on influent vapor line.

Unscheduled site visit ☐ or (Scheduled site visit no. _____ of 14

500 SCFM GAS-FIRED ANGUIL CATALYTIC OXIDIZER (Serial #01169107)

Arrival Time (24:00 hour)	1335
System Status (on or off)	ON
Shutdown Time (24:00 hour)	
Alarm Lights on ?	NONE
Restart Time (24:00 hour)	
Reading Time (24:00 hour)	1422
Well Field (I1) (before dilution)	Dilution valve closed
Vacuum (In. of H2O)	40-41
Flow (velocity: ft/min) (pipe dia. 4")	350-400
Temperature (°F)	60

After Blower (system) (I2) (~~pipe dia. 2"~~ 3")	
Pressure (In. of H2O)	5.4
System Influent Flow (in. of H2O) Pitot(3")	.02
Temperature (°F)	—
System	
Set Point (°F)	610
Fire Box Temperature (°F)	611
Stack Temperature (°F) (stack dia. 6")	602
Hour Meter Reading (Blower)	4000
Gas Meter Reading (cubic feet)	
Total Flow to Unit (SCFM)(flow meter)	<30
CatOx Amperage	4.75
Blower Amperage	5.5
Total Main Amperage	20.0

(System air sampling to be done once every month)

Field monitoring once every 2 weeks (per BAAQMD permit conditions)

~~FID~~/PID READINGS (ppm)	I-1 C/F	I-2	E-1 C/A
Date: 1/31/95	2.8 2.6	N/A	2.6 2.6
Date: Calibrated to Methane	10 ppm	Amb-2.9 ppm	

WELL FIELD (do monthly)

Well ID	Well Dia.	Screen interval	Pipe stub up dia	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (inch. water)	Air flow (ft/min)	FID/PID Reading(ppm)
VW-1 (SVE)	4"	8 - 18	2"						
VW-2 (SVE)	4"	8 - 18	2"						
VW-3 (SVE)	4"	8 - 18	2"						
W-4 (SVE)	4"	9 - 19	2"						
VW-5 (SVE)	4"	8 - 18	2"						
VW-6	4"	9 - 18	N/A						
W-7 (SVE)	4"	7.5 - 17.5	2"						
MW-1	2"	19 - 39	N/A						
W-2 (SVE)	2"	15 - 25	2"						
W-3	2"	20 - 40	N/A						
MW-4	2"	30 - 50	N/A						
W-5	4"	32 - 58	N/A						
W-6	2"	?	N/A						
MW-7	2"	20 - 40	N/A						
W-8	4"	29 - 49	N/A						
W-1	6"	36 - 51	N/A						

Special Instructions:

member to use ARCO chain-of-custody forms. Please include all analytical method numbers, as indicated on the O&M request forms and on the chain-of-stody forms. Request TPHG, BTEX, and benzene results in mg/m3 on the chain-of-custody forms.

Operator: MAdler Date: 1/31/95

EMCON Project: 0805-122.01 94-5

1166.6 mm

REMARKS: System on upon arrival - Took readings
Took Samples at E-1 & I-1
Shut off ~~Oxbtuss~~ on site wells for 1 hr.

7 on 5 off | 12 ON | 16 ON | ↑ NORTH

Unscheduled site visit ☐ or Scheduled site visit no. ______ of 14

500 SCFM GAS-FIRED ANGUIL CATALYTIC OXIDIZER (Serial #01169107)

Arrival Time (24:00 hour)	1400
System Status (on or off)	ON
Shutdown Time (24:00 hour)	—
Alarm Lights on ?	NONE
Restart Time (24:00 hour)	—
Reading Time (24:00 hour)	1430
Well Field (I1) (before dilution)	Dilation closed
Vacuum (In. of H2O)	29.2 - 31.6
Flow (velocity: ft/min) (pipe dia. 4")	550 - 700
Temperature (°F)	60

After Blower (system) (I2) (pipe dia. ?")	
Pressure (In. of H2O)	8.8 - 9.1
System Influent Flow (in. of H2O) pitot	.05 - .07
Temperature (°F)	—
System	
Set Point (°F)	610
Fire Box Temperature (°F)	610
Stack Temperature (°F) (stack dia. 6")	602
Hour Meter Reading	~~[illegible]~~ 659.3
Gas Meter Reading (cubic feet)	
Total Flow to Unit (SCFM)(flow meter)	45 - 47
CatOx Amperage	9
Blower Amperage	9
Total Main Amperage	20

(System air sampling to be done once every month)
Field monitoring once every 2 weeks (per BAAQMD permit conditions)

~~PID~~ FID READINGS (ppm)	I-1 C/F	I-2	E-1 C/F
Date: 2-9-95	2.3 2.1	—	2.1 2.1
Date:	AMB. =	2.0	

Calibrated to Methane 10 ppm **WELL FIELD (do monthly)**

Well ID	Well Dia.	Screen interval	Pipe stub up dia	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (inch. water)	Air flow (ft/min)	FID/PID Reading(ppm)
VW-1 (SVE)	4"	8 - 18	2"						
VW-2 (SVE)	4"	8 - 18	2"						
VW-3 (SVE)	4"	8 - 18	2"						
VW-4 (SVE)	4"	9 - 19	2"						
VW-5 (SVE)	4"	8 - 18	2"						
VW-6	4"	9 - 18	N/A						
VW-7 (SVE)	4"	7.5 - 17.5	2"						
MW-1	2"	19 - 39	N/A						
MW-2 (SVE)	2"	15 - 25	2"						
MW-3	2"	20 - 40	N/A						
MW-4	2"	30 - 50	N/A						
MW-5	4"	32 - 58	N/A						
MW-6	2"	?	N/A						
MW-7	2"	20 - 40	N/A						
MW-8	4"	29 - 49	N/A						
RW-1	6"	36 - 51	N/A						

Special Instructions:
Remember to use ARCO chain-of-custody forms. Please include all analytical method numbers, as indicated on the O&M request forms and on the chain-of-custody forms. Request TPHG, BTEX, and benzene results in mg/m3 on the chain-of-custody forms.

Operator: MAdler Date: 2-9-95 **EMCON Project: 0805-122.01 94-5**

REMARKS: Closed ON site wells at 1536 & opened off site wells
Ran off site wells for 1 hour then took PID & samples
for TO-14 per Kelli Vorazant.
OFF SITE-1 40.4 "wtr. Pitot tube in 3" line = .02" wtr
< 30 CFM Total air flow into unit Blower pressure = 8.5 "wtr
PID - calibrated 100 ppm Isobutylene

Unscheduled site visit ☐ or Scheduled site visit no. _____ of 14

500 SCFM GAS-FIRED ANGUIL CATALYTIC OXIDIZER (Serial #01169107)

Arrival Time (24:00 hour)	
System Status (on or off)	
Shutdown Time (24:00 hour)	
Alarm Lights on ?	
Restart Time (24:00 hour)	
Reading Time (24:00 hour)	1631
Well Field (I1) (before dilution)	
Vacuum (In. of H2O)	
Flow (velocity: ft/min) (pipe dia. 4")	
Temperature (°F)	

After Blower (system) (I2) (pipe dia. ?")	
Pressure (In. of H2O)	
System Influent Flow (in. of H2O)	
Temperature (°F)	
System	
Set Point (°F)	
Fire Box Temperature (°F)	
Stack Temperature (°F) (stack dia. 6")	
Hour Meter Reading	
Gas Meter Reading (cubic feet)	
Total Flow to Unit (SCFM)(flow meter)	
CatOx Amperage	
Blower Amperage	
Total Main Amperage	

(System air sampling to be done once every month)
Field monitoring once every 2 weeks (per BAAQMD permit conditions)

PID READINGS (ppm)	OFF SITE-1	I-2	E-1
Date: 2-9-95	0.0		
Date: AMB=	0.0 ppm		

WELL FIELD (do monthly)

Well ID	Well Dia.	Screen interval	Pipe stub up dia	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (inch. water)	Air flow (ft/min)	FID/PID Reading(ppm)
VW-1 (SVE)	4"	8 - 18	2"						
VW-2 (SVE)	4"	8 - 18	2"						
VW-3 (SVE)	4"	8 - 18	2"						
VW-4 (SVE)	4"	9 - 19	2"						
VW-5 (SVE)	4"	8 - 18	2"						
VW-6	4"	9 - 18	N/A						
VW-7 (SVE)	4"	7.5 - 17.5	2"						
MW-1	2"	19 - 39	N/A						
MW-2 (SVE)	2"	15 - 25	2"						
MW-3	2"	20 - 40	N/A						
MW-4	2"	30 - 50	N/A						
MW-5	4"	32 - 58	N/A						
MW-6	2"	?	N/A						
MW-7	2"	20 - 40	N/A						
MW-8	4"	29 - 49	N/A						
MW-1	6"	36 - 51	N/A						

Special Instructions:
Remember to use ARCO chain-of-custody forms. Please include all analytical method numbers, as indicated on the O&M request forms and on the chain-of-custody forms. Request TPHG, BTEX, and benzene results in mg/m3 on the chain-of-custody forms.

Operator: MAdler Date: 2-9-95 **EMCON Project: 0805-122.01 94-5**

ARCO 276.10600 MacArthur Blvd.(kland . Operation Maintenance Log for( ). EMCON Proj: 805-120.02 94-5

REMARKS: System on upon arrival. Took air flow readings

Unscheduled site visit [X] or Scheduled site visit no. _____ of 14

500 SCFM GAS-FIRED ANGUIL CATALYTIC OXIDIZER (Serial #01169107)

Arrival Time (24:00 hour)	1000
System Status (on or off)	ON
Shutdown Time (24:00 hour)	
Alarm Lights on ?	—
Restart Time (24:00 hour)	—
Reading Time (24:00 hour)	1005
Well Field (I1) (before dilution)	
Vacuum (In. of H2O)	35
Flow (velocity: ft/min) **(pipe dia. 4")**	600-650
Temperature (°F)	59

After Blower (system) (I2) (pipe dia. ?")	
Pressure (In. of H2O)	8.8-9.0
System Influent Flow (in. of H2O)	.05-.07
Temperature (°F)	
System	
Set Point (°F)	610
Fire Box Temperature (°F)	609
Stack Temperature (°F) **(stack dia. 6")**	602
Hour Meter Reading	
Gas Meter Reading (cubic feet)	
Total Flow to Unit (SCFM)(flow meter)	45
CatOx Amperage	
Blower Amperage	
Total Main Amperage	

(System air sampling to be done once every month)

Field monitoring once every 2 weeks (per BAAQMD permit conditions)

PID/FID READINGS (ppm)	I-1	I-2	E-1
Date:			
Date:			

WELL FIELD (do monthly)

Well ID	Well Dia.	Screen interval	Pipe stub up dia	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (inch. water)	Air flow (ft/min)	FID/PID Reading(ppm)
VW-1 (SVE)	4"	8 - 18	2"						
VW-2 (SVE)	4"	8 - 18	2"						
VW-3 (SVE)	4"	8 - 18	2"						
VW-4 (SVE)	4"	9 - 19	2"						
VW-5 (SVE)	4"	8 - 18	2"						
VW-6	4"	9 - 18	N/A						
VW-7 (SVE)	4"	7.5 - 17.5	2"						
MW-1	2"	19 - 39	N/A						
MW-2 (SVE)	2"	15 - 25	2"						
MW-3	2"	20 - 40	N/A						
MW-4	2"	30 - 50	N/A						
MW-5	4"	32 - 58	N/A						
MW-6	2"	?	N/A						
MW-7	2"	20 - 40	N/A						
MW-8	4"	29 - 49	N/A						
RW-1	6"	36 - 51	N/A						

Special Instructions:

Remember to use ARCO chain-of-custody forms. Please include all analytical method numbers, as indicated on the O&M request forms and on the chain-of-custody forms. Request TPHG, BTEX, and benzene results in mg/m3 on the chain-of-custody forms.

Operator: MMadden Date: 2-16-95 **EMCON Project: 0805-122.01 94-5**

ARCO 276.10600 MacArthur Blvd. ,kland . Operation Maintenance Log for(5 . EMCON Proj: 805-120.02 94-5

REMARKS: System on upon arrival • Took DTW's at all vapor extraction wells and MW-2 x MW-7 • Opened all vapor wells to system and opened OFF site manifold to the system. Then Took readings OFF site 8.5-8.8 "wtr. VAC. @ 650-700 FPM (2") • Installed port to check OFF site air flow. Took samples at E-1 I-1 (Well Field on site) I-2 (Total influent after blowers) and OFF SITE Unscheduled site visit [X] or Scheduled site visit no. _____ of 14

500 SCFM GAS-FIRED ANGUIL CATALYTIC OXIDIZER (Serial #01169107)

Arrival Time (24:00 hour)	1000
System Status (on or off)	ON
Shutdown Time (24:00 hour)	—
Alarm Lights on ?	— NONE
Restart Time (24:00 hour)	—
Reading Time (24:00 hour)	1362
Well Field ONSITE @ I-1 (before dilution)	
Vacuum (In. of H2O)	8.1-8.5
Flow (velocity: ft/min) (pipe dia. 4")	800-850
Temperature (°F)	590

After Blower (system) (I2) (pipe dia. ?")	
Pressure (In. of H2O)	10.5-10.9
System Influent Flow (in. of H2O) Pitot	.15-.17
Temperature (°F)	—
System	
Set Point (°F)	610
Fire Box Temperature (°F)	609
Stack Temperature (°F) (stack dia. 6")	602
Hour Meter Reading	856.4
Gas Meter Reading (cubic feet)	8192
Total Flow to Unit (SCFM)(flow meter)	67
CatOx Amperage	9.7
Blower Amperage	8.5
Total Main Amperage	20

(System air sampling to be done once every month)
Field monitoring once every 2 weeks (per BAAQMD permit conditions)

PID/FID READINGS (ppm)	I-1	I-2	E-1
Date:			
Date:			

WELL FIELD (do monthly)

Well ID	Well Dia.	Screen Interval	Pipe stub up dia	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (inch. water)	Air flow (ft/min)	FID/PID Reading(ppm)
VW-1 (SVE)	4"	8 - 18	2"	ND	14.97	Full open			
VW-2 (SVE)	4"	8 - 18	2"	ND	11.50	Full open			
VW-3 (SVE)	4"	8 - 18	2"	ND	11.63	Full open			
VW-4 (SVE)	4"	9 - 19	2"	ND	14.35	Full open			
VW-5 (SVE)	4"	8 - 18	2"	ND	13.85	Full open			
VW-6	4"	9 - 18	N/A						
VW-7 (SVE)	4"	7.5 - 17.5	2"	ND	14.96	Full open			
MW-1	2"	19 - 39	N/A						
MW-2 (SVE)	2"	15 - 25	2"	ND	15.06	Full OPEN			
MW-3	2"	20 - 40	N/A						
MW-4	2"	30 - 50	N/A						
MW-5	4"	32 - 58	N/A						
MW-6	2"	?	N/A						
MW-7	2"	20 - 40	N/A	ND	18.64				
MW-8	4"	29 - 49	N/A						
MW-1	6"	36 - 51	N/A						

Special Instructions:
Remember to use ARCO chain-of-custody forms. Please include all analytical method numbers, as indicated on the O&M request forms and on the chain-of-custody forms. Request TPHG, BTEX, and benzene results in mg/m3 on the chain-of-custody forms.

Operator: MAdler Date: 2-16-95 **EMCON Project: 0805-122.01 94-5**

ARCO 276.10600 MacArthur Blvd., (.kland . Operation Maintenance Log for (. EMCON Proj: 805-120.02 94-5

REMARKS: System on & running upon arrival. Took FID readings
Took System readings & Changed Chart paper
Collected 10 gallons of condensate so far in K.O. drum
Cleaned pad of leaves & seed pods.
OFF Site = 9.7-9.5" wtr. Vac at 400-450 FPM (2")

Unscheduled site visit ☐ or (Scheduled site visit no. _____ of 14

500 SCFM GAS-FIRED ANGUIL CATALYTIC OXIDIZER (Serial #01169107)

Arrival Time (24:00 hour)	1045
System Status (on or off)	ON
Shutdown Time (24:00 hour)	—
Alarm Lights on ?	NONE
Restart Time (24:00 hour)	—
Reading Time (24:00 hour)	1122
Well Field (I1) (before dilution)	
Vacuum (In. of H2O)	9.1-9.2
Flow (velocity: ft/min) (pipe dia. 4")	850
Temperature (°F)	61

After Blower (system) (I2) (pipe dia. 7")	
Pressure (In. of H2O) (3")	10.6-10.8
System Influent Flow (in. of H2O) Pitot	.16-.17
Temperature (°F)	—
System	
Set Point (°F)	610
Fire Box Temperature (°F)	611
Stack Temperature (°F) (stack dia. 6")	602
Hour Meter Reading	1239.0
Gas Meter Reading (cubic feet)	
Total Flow to Unit (SCFM)(flow meter)	67-68
CatOx Amperage	9.5
Blower Amperage	8.5
Total Main Amperage	19
OFF Site = 1.9 ppm	

(System air sampling to be done once every month)
Field monitoring once every 2 weeks (per BAAQMD permit conditions)

PID/FID READINGS (ppm)	I-1	I-2	E-1
Date: 3-3-95	1.9	2.0	2.2
Date:	Amb =	1.7 ppm	

Calibrated w/ Methane 10 ppm **WELL FIELD (do monthly)**

Well ID	Well Dia.	Screen interval	Pipe stub up dia	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (inch. water)	Air flow (ft/min)	FID/PID Reading(ppm)
VW-1 (SVE)	4"	8 - 18	2"						
VW-2 (SVE)	4"	8 - 18	2"						
VW-3 (SVE)	4"	8 - 18	2"						
VW-4 (SVE)	4"	9 - 19	2"						
VW-5 (SVE)	4"	8 - 18	2"						
VW-6	4"	9 - 18	N/A						
VW-7 (SVE)	4"	7.5 - 17.5	2"						
MW-1	2"	19 - 39	N/A						
MW-2 (SVE)	2"	15 - 25	2"						
MW-3	2"	20 - 40	N/A						
MW-4	2"	30 - 50	N/A						
MW-5	4"	32 - 58	N/A						
MW-6	2"	?	N/A						
MW-7	2"	20 - 40	N/A						
MW-8	4"	29 - 49	N/A						
RW-1	6"	36 - 51	N/A						

Special Instructions:
Remember to use ARCO chain-of-custody forms. Please include all analytical method numbers, as indicated on the O&M request forms and on the chain-of-custody forms. Request TPHG, BTEX, and benzene results in mg/m3 on the chain-of-custody forms.

Operator: MAdler Date: 3-3-95 **EMCON Project: 0805-122.01 94-5**

ARCO 276.10600 MacArthur Blvd. Oakland . Operation Maintenance Log for . EMCON Proj: 805-120.02 94-5

REMARKS:
System on & running upon arrival. K.O. has captured approx. 20 gallons of condensate. Took readings then took samples at OFF SITE, I-1, I-2, and E-1
Blower @ (2") . OFF Site - 14.9-15.2" wtr. vac @ 500-550 FPM (2")

Unscheduled site visit ☐ or (Scheduled site visit no. ____ of 14

500 SCFM GAS-FIRED ANGUIL CATALYTIC OXIDIZER (Serial #01169107)

Arrival Time (24:00 hour)	0836
System Status (on or off)	ON
Shutdown Time (24:00 hour)	—
Alarm Lights on ?	NONE
Restart Time (24:00 hour)	—
Reading Time (24:00 hour)	0858
Well Field ONSite (I1) (before dilution)	Dilution CLOSED
Vacuum (In. of H2O)	14.6-15.1
Flow (velocity: ft/min) (pipe dia. 4")	800-850
Temperature (°F)	60

After Blower (system) (I2) (pipe dia. ?")	
Pressure (In. of H2O) (3")	9.8-10.1
System Influent Flow (in. of H2O) pitot	.13-.15
Temperature (°F)	—
System	
Set Point (°F)	610
Fire Box Temperature (°F)	611
Stack Temperature (°F) (stack dia. 6")	602
Hour Meter Reading	1552.8
Gas Meter Reading (cubic feet)	9147
Total Flow to Unit (SCFM)(flow meter)	63
CatOx Amperage	8.5
Blower Amperage	8.5
Total Main Amperage	19

(System air sampling to be done once every month)

Field monitoring once every 2 weeks (per BAAQMD permit conditions)

PID/FID READINGS (ppm)	I-1	I-2	E-1
Date:	NA		
Date:			

WELL FIELD (do monthly)

Well ID	Well Dia.	Screen Interval	Pipe stub up dia	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (inch. water)	Air flow (ft/min)	FID/PID Reading(ppm)
VW-1 (SVE)	4"	8 - 18	2"						
VW-2 (SVE)	4"	8 - 18	2"						
VW-3 (SVE)	4"	8 - 18	2"						
VW-4 (SVE)	4"	9 - 19	2"						
VW-5 (SVE)	4"	8 - 18	2"						
VW-6	4"	9 - 18	N/A						
VW-7 (SVE)	4"	7.5 - 17.5	2"						
MW-1	2"	19 - 39	N/A						
MW-2 (SVE)	2"	15 - 25	2"						
MW-3	2"	20 - 40	N/A						
MW-4	2"	30 - 50	N/A						
MW-5	4"	32 - 58	N/A						
MW-6	2"	?	N/A						
MW-7	2"	20 - 40	N/A						
MW-8	4"	29 - 49	N/A						
RW-1	6"	36 - 51	N/A						

Special Instructions:
Remember to use ARCO chain-of-custody forms. Please include all analytical method numbers, as indicated on the O&M request forms and on the chain-of-custody forms. Request TPHG, BTEX, and benzene results in mg/m3 on the chain-of-custody forms.

Operator: MAdler Date: 3-14-95 **EMCON Project: 0805-122.01 94-5**

Remarks: System on x running upon arrival - Cleaned pad of leaves, pods, trash, limbs that were blown in.

Took readings - Took FID's - I took FID's the same as I would sample then took (SB-1) blank of sample box for TO-14 per Valli.

Installed Thermometer on (3") Total Influent line.

OFF site well field is Full open.

Unscheduled site visit [] Scheduled site visit [X]

SYSTEM PARAMETERS (500 SCFM Gas-Fired ANGUIL Catalytic Oxidizer/ Serial # 01169107)

Arrival Time (24:00 hour)	1145	Effluent (6") E-1 Stack Temperature (°F)	603
System Status (on or off)	ON	Total Flow (scfm) (flow meter)	63
Shutdown Time (24:00 hour)	—	F.'g Box Temperature (°F)	610
Restart Time (24:00 hour)	—	Set Point (°F)	610
Reading Time (24:00 hour)	1253	**TOTAL HOURS**	1931.9
ON SITE Well Field (4") I-1		CatOx (Amps)	9.5
Vacuum (in. of H2O)	14.2-14.7	Blower (Amps)	8.6
Velocity (ft/min)	750-800	Main (Amps)	18
Temperature (°F)	61	Natural Gas (cf)	9617
OFF SITE Well Field (2") Off Site		**AIR MONITORING**	
Vacuum (in. of H2O)	14.9-15.3	FID (ppm) Date: 3/27	Amb / I-2 / I-1 / Off Site / E-1
Velocity (ft/min)	500-600	(without carbon filter)	1.7 / 2.5 / 2.8 / 1.7 / 1.7
Total Influent (After Blower) (3") I-2		(with carbon filter)	1.7 / 2.0 / 1.9 / 1.7 / 1.7
Total Pressure (in. of H2O)	10.8-11.2	PID (ppm)	CAL GAS: Methane 10 ppm
Total Flow (in. of H2O)	.14-.15	Date:	
Temperature (°F)	110	Lab samples taken for analysis at:	sample box blank
Total Vapor Condensate on site (gal)	20	SB-1 for TO-14	

WELL FIELD

SVE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (in. of H2O)	FID (ppm)	PID (ppm)	REMARKS
VW-1	4"	8'-18'			Full on				
VW-2	4"	8'-18'			Full on				
VW-3	4"	8'-18'			Full on				
VW-4	4"	9'-19'			Full on				
VW-5	4"	8'-18'			Full on				
VW-7	4"	7.5'-17.5'			Full on				
MW-2	2"	15'-25'			Full on				

Special Instructions:

Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form. Request all TPHG,BTEX, and Benzene results in mg/m3. Report O2 and CO2 in % by volume.

Operator: MAdlen Date: 3-27-95

Project# 0805-120.04

ARCO 0276 Soil Vapor Extraction System

ARCO 0276 . 10600 MacArthur Blvd.,Oakland,Ca. Soil Vapor Extraction System . EMCON Project # 0805-120.04

Remarks: System on & running upon arrival. Unit OK
Cleaned leaves & trash that blew into compound
Took readings
Took FID Readings

Met D.L. Robinson on Site for BAAQMD inspection of CATOX
415-771-6000 FAX 415-928-0338
Had to fax extra data to her today also, Had Sailaja & Valli look at before faxing

Unscheduled site visit [] Scheduled site visit [X]

SYSTEM PARAMETERS (500 SCFM Gas-Fired ANGUIL Catalytic Oxidizer/ Serial # 01169107)

Arrival Time (24:00 hour)	0725	Effluent (6") E-1 Stack Temperature (°F)	602
System Status (on or off)	ON	Total Flow (scfm) (flow meter)	67
Shutdown Time (24:00 hour)	—	Fire Box Temperature (°F)	610
Restart Time (24:00 hour)	—	Set Point (°F)	610
Reading Time (24:00 hour)	0758	**TOTAL HOURS**	2443.2
ON SITE Well Field (4") I-1		CatOx (Amps)	9.0
Vacuum (in. of H2O)	9.8-10.1	Blower (Amps)	8.8
Velocity (ft/min)	800-850	Main (Amps)	18
Temperature (°F)	64	Natural Gas (cf)	0291
OFF SITE Well Field (2") Off Site		**AIR MONITORING**	
Vacuum (in. of H2O)	10.3-10.6	FID (ppm) Date: 4/14	Amb / I-2 / I-1 / Off Site / E-1
Velocity (ft/min)	350-450	(without carbon filter)	1.9 / 2.9 / 3.1 / 1.9 / 2.0
Total Influent (After Blower) (3") I-2		(with carbon filter)	1.8 / 1.9 / 1.9 / 1.8 / 1.9
Total Pressure (in. of H2O)	10.9-11.2	PID (ppm)	CAL GAS: Methane 10 ppm
Total Flow (in. of H2O)	.14-.15	Date:	
Temperature (°F)	104	Lab samples taken for analysis at:	NONE
Total Vapor Condensate on site (gal)	20-25		

WELL FIELD

SVE WELL ID	Well Diameter	Screen Interval	DTFP (feet)	DTW (feet)	Valve Position (% open)	Vacuum (in. of H2O)	FID (ppm)	PID (ppm)	REMARKS
VW-1	4"	8'-18'							
VW-2	4"	8'-18'							
VW-3	4"	8'-18'							
VW-4	4"	9'-19'							
VW-5	4"	8'-18'							
VW-7	4"	7.5'-17.5'							
MW-2	2"	15'-25'							

Special Instructions:

Use only ARCO chain-of-custody forms. Please include all analytical method numbers as requested on the chain-of-custody form. Request all TPHG,BTEX, and Benzene results in mg/m3. Report O2 and CO2 in % by volume.

Operator: MAdler Date: 4-14-95

Project# 0805-120.04
ARCO 0276 Soil Vapor Extraction System