

**EMCON**

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

9/26/97

SOS

Date June 25, 1997Project 20805-121.005

To:

Mr. Scott Seery

Alameda County Health Care Services Agency

Department of Environmental Health

1131 Harborbay Parkway, Suite 250

Alameda, California 94502

We are enclosing:

Copies	Description
<u>1</u>	<u>First quarter 1997 groundwater monitoring results</u>
	<u>for ARCO service station 601, San Leandro, California</u>
<u>1</u>	<u>John Sullivan letter</u>

For your:	<u>X</u>	Use	Sent by:	<u>X</u>	Regular Mail
		Approval			Standard Air
		Review			Courier
		Information			Other: <u>Cert. Mail</u>

Comments:

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

Valli Voruganti
Project Manager

cc: Kevin Graves, RWQCB - SFBR
Mike Bakaldin, SLFD
Paul Supple, ARCO Products Company
File





Date:

June 25, 1997

Re: ARCO Station #

601 • 712 Lewelling Boulevard • San Leandro, CA
First Quarter 1997 Groundwater Monitoring Results

"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:

A handwritten signature in black ink, appearing to read "Paul Supple". The signature is written in a cursive, flowing style.

Paul Supple
Environmental Engineer

**EMCON**

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

June 27, 1997
Project 20805-121.005

Mr. John Sullivan
17760 Sweetbriar Place
Castro Valley, California 94546

Re: First quarter 1997 laboratory analytical results, groundwater samples, Chateau Manor Apartments, 724 Lewelling Boulevard, San Leandro, California

Dear Mr. Sullivan:

Enclosed please find copies of the laboratory analytical results for groundwater samples collected from wells MW-9 and MW-10 during the first quarter of 1997. These wells are located at Chateau Manor Apartments, 724 Lewelling Boulevard, San Leandro, California. The groundwater samples were collected on March 24, 1997, during quarterly sampling of the ARCO Products Company service station 601, 712 Lewelling Boulevard, San Leandro. The laboratory analytical results indicate that the groundwater sample concentrations were not detectable for total petroleum hydrocarbons as gasoline, and the gasoline constituents benzene, toluene, ethylbenzene, and total xylenes.

Please call if you have questions.

Sincerely,

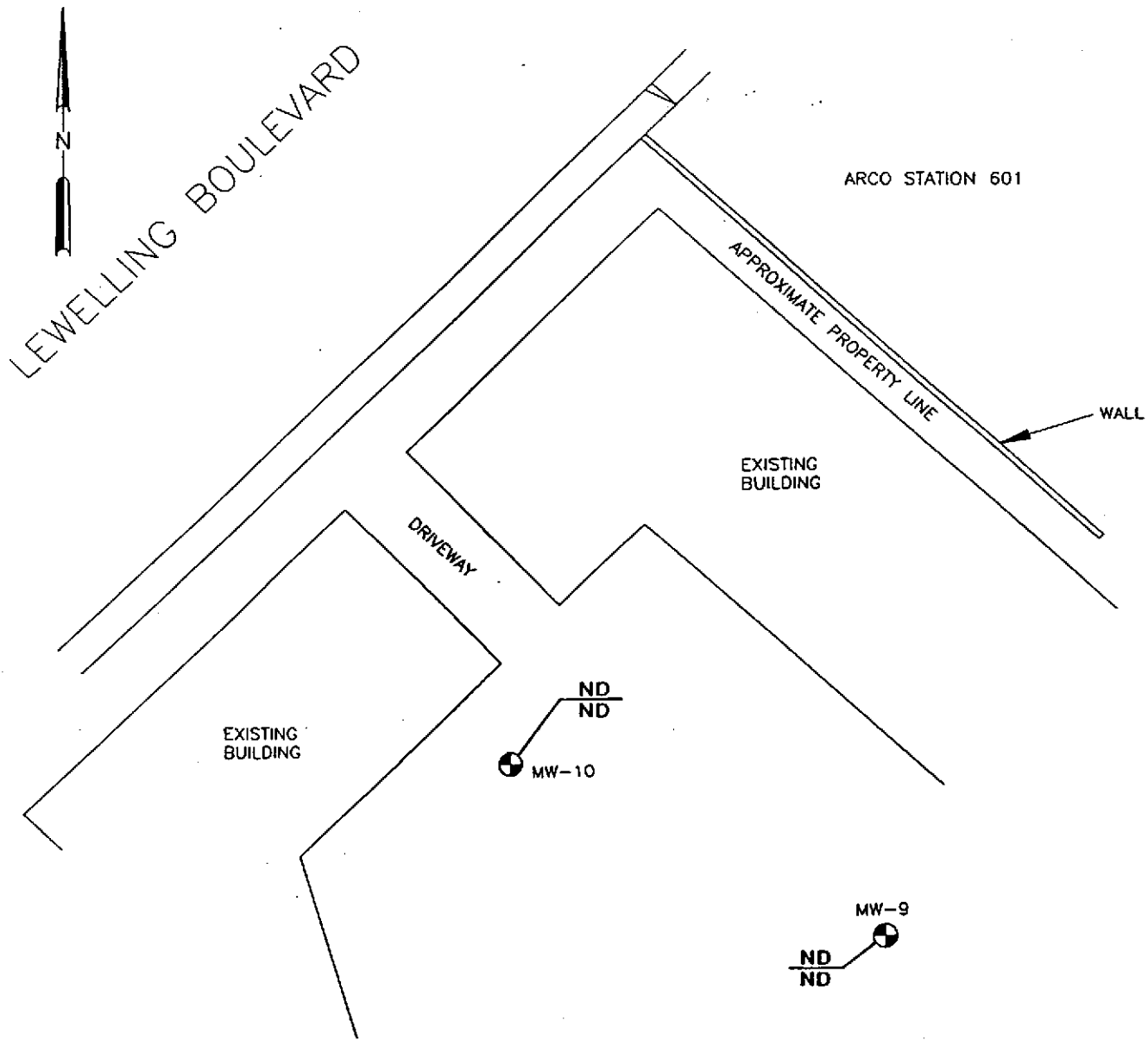
EMCON

Valli Voruganti
Project Manager

Attachments: Figure 1 - Generalized Site Plan
Attachment A - Copy of Analytical Results and Chain-of-Custody
Documentation, Wells MW-9 and MW-10,
First Quarter 1997

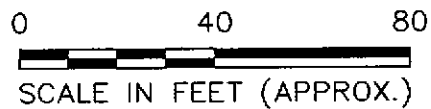
cc: Scott Seery, ACHCSA
Kevin Graves, RWQCB - SFBR
Paul Supple, ARCO Products Company
File





EXPLANATION

- Groundwater monitoring well
- ND — TPHG concentration in groundwater (ppb)
- ND — Benzene concentration in groundwater (ppb)
- ND Not detected



Base map modified from RESNA, 1994.



DATE JUNE 1997
 DWN KMM
 APP _____
 REV 0
 PROJECT NO.
 20805-121.005

FIGURE 1
 CHATEAU MANOR APARTMENTS
 724 LEWELLING BLVD.
 SAN LEANDRO, CALIFORNIA
**QUARTERLY GROUNDWATER MONITORING
 GENERALIZED SITE PLAN**

ATTACHMENT A

**COPY OF ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY
DOCUMENTATION, WELLS MW-9 AND MW-10,
FIRST QUARTER 1997**



April 9, 1997

Service Request No.: S9700547

Mr. John Young
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

RE: 601 SAN LEANDRO/20805-121.004/TO#19350.00

Dear Mr. Young:

The following pages contain analytical results for sample(s) received by the laboratory on March 26, 1997. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 7, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,

Steven L. Green
Project Chemist

Greg Anderson
Regional QA Coordinator

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
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
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. 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
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
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 method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

ACRONLST.DOC 7/14/95

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00
Sample Matrix: Water

Service Request: S9700547
Date Collected: 3/24/97
Date Received: 3/26/97
Date Extracted: NA

BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name:	MW-9 (16)	MW-10 (18)	Method Blank
Lab Code:	S9700547-001	S9700547-002	S9700404-WB1
Date Analyzed:	4/4/97	4/4/97	4/4/97

Analyte	MRL			
TPH as Gasoline	50	ND	ND	ND
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	ND	ND	ND
Methyl <i>tert</i> -Butyl Ether	3	ND	ND	ND

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00
Sample Matrix: Water

Service Request: S9700547
Date Collected: 3/24/97
Date Received: 3/26/97
Date Extracted: NA
Date Analyzed: NA

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

Sample Name	Lab Code	PID Detector	FID Detector
		Percent Recovery 4-Bromofluorobenzene	Percent Recovery α,α,α -Trifluorotoluene
MW-9 (16)	S9700547-001	100	92
MW-10 (18)	S9700547-002	98	91
Method Blank	S9700404-WB1	97	91
MW-9 (16)	S9700547-001MS	103	95
MW-9 (16)	S9700547-001DMS	101	91

CAS Acceptance Limits: 69-116 69-116

COLUMBIA ANALYTICAL SERVICES, INC.**QA/QC Report**

Client:	ARCO Products Company	Service Request:	S9700547
Project:	601 SAN LEANDRO/20805-121.004/TO#19350.00	Date Collected:	3/24/97
Sample Matrix:	Water	Date Received:	3/26/97
		Date Extracted:	NA
		Date Analyzed:	4/4/97

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

Sample Name: MW-5(16)
Lab Code: S9700547-001MS, DMS

Analyte	Spike Level		Sample Result	Spike Result		Percent Recovery			Relative Percent Difference
	MS	DMS		MS	DMS	MS	DMS	CAS	
								Acceptance Limits	
Benzene	25	25	ND	26	26	104	104	75-135	<1
Toluene	25	25	ND	26	26	104	104	73-136	<1
Ethylbenzene	25	25	ND	27	26	108	104	69-142	4

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00

Service Request: S9700547
Date Analyzed: 4/4/97

**Initial Calibration Verification (ICV) Summary
BTEX, MTBE 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	100	85-115
Toluene	25	26	104	85-115
Ethylbenzene	25	26	104	85-115
Xylenes, Total	75	78	104	85-115
Gasoline	250	250	100	90-110
Methyl <i>tert</i> -Butyl Ether	25	24	96	85-115

Division of Atlantic Richfield Company

19350.00

Laboratory name	
-----------------	--

ARCO Facility no.

City

(Facility)

San Leandro

Project manager

(Consultant)

John

Fax no.

(Consultant)

ARCO engineer

PAUL SUPPLE

Telephone no.

(ARCO)

Telephone no.

(Consultant)

Consultant name	
-----------------	--

³Em con

Address

(Consultant)

1971 Ringwood

A/4

Contract number

Method of shipment	
--------------------	--

Special detection	
Limit/reporting	

Special QA/QC

Remarks

Lab number

Turnaround time

Priority Rush
1 Business Day

**Rush
2 Business Days**

Expedited	5 Business Days
-----------	-----------------

Standard
10 Business Days

[illegible]

Condition of sample:

Relinquished by sampler

Relinquished by

Relinquished by

Temperature received:

Received by

Received by

Received by laboratory

Date _____

Time

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

APPC-3292 (2-91)

**EMCON**

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

June 27, 1997
Project 20805-121.005

Mr. Paul Supple
ARCO Products Company
P.O. Box 6549
Moraga, California 94570

Re: First quarter 1997 groundwater monitoring program results, ARCO service station 601, San Leandro, California

Dear Mr. Supple:

This letter presents the results of the first quarter 1997 groundwater monitoring program at ARCO Products Company (ARCO) service station 601, 712 Lewelling Boulevard, San Leandro, California (Figure 1). The quarterly monitoring program complies with Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

LIMITATIONS

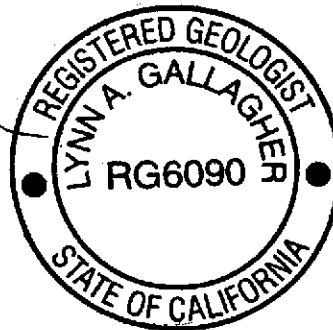
No monitoring event is thorough enough to describe all geologic and hydrogeologic conditions of interest at a given site. If conditions have not been identified during the monitoring event, such a finding should not therefore be construed as a guarantee of the absence of such conditions at the site,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

Please call if you have questions.

Sincerely,

EMCON

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



June 27, 1997

ARCO QUARTERLY REPORT

Station No.: 601 Address: 712 Lewelling Boulevard, San Leandro, California
EMCON Project No. 20805-121.005
ARCO Environmental Engineer/Phone No.: Paul Supple /(510) 299-8891
EMCON Project Manager/Phone No.: Valli Voruganti /(408) 453-7300
Primary Agency/Regulatory ID No.: ACHCSA /Scott Seery

WORK PERFORMED THIS QUARTER (First- 1997):

1. Performed quarterly groundwater monitoring for first quarter 1997.
2. Prepared and submitted quarterly groundwater monitoring report for fourth quarter 1996.
3. Stimulated natural biodegradation with oxygen releasing compounds (ORCs) in groundwater monitoring well MW-8.
4. Prepared and submitted a risk-based corrective action evaluation to the ACHCSA.

WORK PROPOSED FOR NEXT QUARTER (Second- 1997):

1. Perform quarterly groundwater monitoring and sampling for second quarter 1997.
2. Prepare and submit quarterly groundwater monitoring report for first quarter 1997.
3. Continue to monitor dissolved oxygen in groundwater monitoring wells MW-2, MW-3, MW-5, and MW-8.
4. Evaluate potential off-site plume migration.

QUARTERLY MONITORING:

Current Phase of Project:	<u>Quarterly Groundwater Monitoring</u>
Frequency of Sampling:	<u>Quarterly (groundwater)</u>
Frequency of Monitoring:	<u>Quarterly (groundwater)</u>
Is Floating Product (FP) Present On-site:	☐ Yes ☒ No
Cumulative FP Recovered to Date :	<u>3.45 gallons, Well MW-1</u>
FP Recovered This Quarter :	<u>None</u>
Bulk Soil Removed to Date :	<u>1,565 cubic yards of TPH impacted soil</u>
Bulk Soil Removed This Quarter :	<u>None</u>
Water Wells or Surface Waters within 2000 ft., impacted by site:	<u>None</u>
Current Remediation Techniques:	<u>Enhanced bioremediation</u>
Average Depth to Groundwater:	<u>8.05 feet</u>
Groundwater Gradient (Average):	<u>0.013 ft/ft toward southeast (consistent with past events)</u>

ATTACHED:

- Table 1 - Groundwater Monitoring Data, First Quarter 1997
- Table 2 - Historical Groundwater Elevation and Analytical Data, Petroleum Hydrocarbons and Their Constituents
- Table 3 - Historical Groundwater Analytical Data, Metals
- Table 4 - Historical Groundwater Analytical Data, Volatile and Semivolatile Organic Compounds
- Table 5 - Approximate Cumulative Floating Product Recovered, Monitoring Well MW-1
- Figure 1 - Site Location

- Figure 2 - Groundwater Data, First Quarter 1997
- Appendix A - Analytical Results and Chain of Custody Documentation, First Quarter 1997
Groundwater Monitoring Event

cc: Scott Seery, ACHCSA
Kevin Graves, RWQCB-SFBR
Mike Bakaldin, SLFD

Table 1
Groundwater Monitoring Data
First Quarter 1997

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Date: 06-12-97

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater Flow Direction MWN	Hydraulic Gradient ft/ft	Water Sample Field Date	TPHG LUFT Method µg/L	Benzene EPA 8020 µg/L	Toluene EPA 8020 µg/L	Ethylbenzene EPA 8020 µg/L	Total Xylenes EPA 8020 µg/L	MTBE EPA 8020 µg/L	MTBE EPA 8240 µg/L	TRPH EPA 418.1 µg/L	TPHD LUFT Method µg/L
MW-1	03-24-97	19.19	8.05	11.14	ND	SE	0.013	03-24-97	170000	6500	<200 [^]	2400	9900	<1000 [^]	--	--	--
MW-2	03-24-97	21.12	7.11	14.01	ND	SE	0.013	03-24-97	4800	570	6	71	32	67	--	--	--
MW-3	03-24-97	22.99	6.94	16.05	ND	SE	0.013	03-24-97	430000	2700	7600	7000	39000	<5000 [^]	--	--	--
MW-4	03-24-97	22.38	6.90	15.48	ND	SE	0.013	03-24-97	6800	620	150	81	1300	<50 [^]	--	--	--
MW-5	03-24-97	22.45	7.13	15.32	ND	SE	0.013	03-24-97	39000	8200	3200	720	3100	<500 [^]	--	--	--
MW-6	03-24-97	22.77	7.95	14.82	ND	SE	0.013	03-24-97	9700	1900	<20 [^]	800	270	<100 [^]	--	--	--
MW-7	03-24-97	22.89	8.31	14.58	ND	SE	0.013	03-24-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-8	03-24-97	20.89	7.33	13.56	ND	SE	0.013	03-24-97	1400	<10 [^]	<10 [^]	<10 [^]	12	1300	--	--	--
MW-9	03-24-97	22.26	7.74	14.52	ND	SE	0.013	03-24-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-10	03-24-97	21.33	7.87	13.46	ND	SE	0.013	03-24-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-11	03-24-97	20.97	8.15	12.82	ND	SE	0.013	03-24-97	63	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-12	03-24-97	20.11	8.75	11.36	ND	SE	0.013	03-24-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-13	03-24-97	20.75	7.85	12.90	ND	SE	0.013	03-24-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-14	03-24-97	20.90	8.98	11.92	ND	SE	0.013	03-24-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-15	03-24-97	22.08	6.00	16.08	ND	SE	0.013	03-24-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--

ft-MSL: elevation in feet, relative to mean sea level

MWN: ground-water flow direction and gradient apply to the entire monitoring well network

ft/ft: foot per foot

TPHG: total petroleum hydrocarbons as gasoline, California DHS LUFT Method

µg/L: micrograms per liter

EPA: United States Environmental Protection Agency

MTBE: Methyl tert-butyl ether

TRPH: total recoverable petroleum hydrocarbons

TPHD: total petroleum hydrocarbons as diesel, California DHS LUFT Method

SE: southeast

--: not analyzed

ND: none detected

[^]: method reporting limit was raised due to: (1) high analyte concentration requiring sample dilution, or (2) matrix interference

Table 2
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present***

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Date: 06-12-97

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater Flow Direction MWN	Hydraulic Gradient ft/ft	Water Sample Field Date	TPHG LUFT Method µg/L	Benzene EPA 8020 µg/L	Toluene EPA 8020 µg/L	Ethylbenzene EPA 8020 µg/L	Total Xylenes EPA 8020 µg/L	MTBE EPA 8020 µg/L	MTBE EPA 8240 µg/L	TRPH EPA 418.1 µg/L	TPHD LUFT Method µg/L
MW-1	03-17-95	22.26	6.57	15.69	ND	WSW	0.006	03-17-95	120000	5300	370	1500	13000	--	--	48000	6200*
MW-1	06-01-95	22.26	7.87	14.39	ND	SW	0.003	06-01-95	250000	7100	950	3500	21000	--	--	38000	190000*
MW-1	08-31-95	22.26	8.12	** 14.15	0.01	SSW	0.005	08-31-95	Not sampled: well contained floating product								
MW-1	11-27-95	22.26	8.42	13.84	Sheen	SSW	0.004	11-27-95	310000	4600	770	5700	21000	--	--	--	--
MW-1	02-22-96	22.26	6.01	** 16.26	0.01	NW	0.007	03-14-96	100000	6200	320	2500	12000	<1000*	--	--	--
MW-1	05-20-96	22.26	7.03	15.23	ND	SW	0.007	05-21-96	340000	6600	240	4500	22000	<1000^	--	150	<2500*
MW-1	08-26-96	22.26	8.16	14.10	ND	SSW	0.004	08-26-96	210000	7900	320	3400	15000	<1000^	--	--	--
MW-1	11-20-96	22.26	7.84	14.42	ND	SSE	0.004	11-20-96	62000	5900	77	2000	7700	<300^	--	--	--
MW-1	03-24-97	19.19	8.05	11.14	ND	SE	0.013	03-24-97	170000	6500	<200^	2400	9900	<1000^	--	--	--
MW-2	03-17-95	21.33	6.12	15.21	ND	WSW	0.006	03-17-95	10000	460	77	260	550	--	--	--	--
MW-2	06-01-95	21.33	6.56	14.77	ND	SW	0.003	06-01-95	13000	400	78	210	410	--	--	--	--
MW-2	08-31-95	21.33	7.18	14.15	ND	SSW	0.005	08-31-95	5000	280	18	120	140	<50^	--	--	--
MW-2	11-27-95	21.33	7.39	13.94	ND	SSW	0.004	11-27-95	3200	230	12	77	90	--	--	--	--
MW-2	02-22-96	21.33	5.78	15.55	ND	NW	0.007	03-14-96	11000	290	67	190	330	<50^	--	--	--
MW-2	05-20-96	21.33	6.27	15.06	ND	SW	0.007	05-21-96	Not sampled: well sampled annually, during the first quarter								
MW-2	08-26-96	21.33	7.30	14.03	ND	SSW	0.004	08-26-96	Not sampled: well sampled annually, during the first quarter								
MW-2	11-20-96	21.33	7.28	14.05	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the first quarter								
MW-2	03-24-97	21.12	7.11	14.01	ND	SE	0.013	03-24-97	4800	570	6	71	32	67	--	--	--

Table 2
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present***

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Date: 06-12-97

Well Designation	Water Level Field Date	Top of Casing Elevation ft-MSL	Depth to Water feet	Groundwater Elevation ft-MSL	Floating Product Thickness feet	Groundwater Flow Direction MWN	Hydraulic Gradient ft/ft	Water Sample Field Date	TPHG LUFT Method µg/L	Benzene EPA 8020 µg/L	Toluene EPA 8020 µg/L	Ethylbenzene EPA 8020 µg/L	Total Xylenes EPA 8020 µg/L	MTBE EPA 8020 µg/L	MTBE EPA 8240 µg/L	TRPH EPA 418.1 µg/L	TPHD LUFT Method µg/L
MW-3	03-17-95	20.11	5.46	14.65	ND	WSW	0.006	03-17-95	370000	4800	12000	5800	34000	--	--	--	--
MW-3	06-01-95	20.11	6.34	13.77	ND	SW	0.003	06-01-95	270000	6000	11000	5200	28000	--	--	--	--
MW-3	08-31-95	20.11	6.60	** 13.52	0.02	SSW	0.005	08-31-95	Not sampled: well contained floating product								
MW-3	11-27-95	20.11	6.76	** 13.36	0.01	SSW	0.004	11-27-95	150000	5100	8800	3900	21000	--	--	--	--
MW-3	02-22-96	20.11	5.14	** 14.98	0.01	NW	0.007	03-14-96	150000	4400	7600	4100	22000	<3000^	--	--	--
MW-3	05-20-96	20.11	5.17	14.94	ND	SW	0.007	05-21-96	410000	4700	8000	6300	36000	<3000^	--	--	--
MW-3	08-26-96	20.11	7.04	13.07	ND	SSW	0.004	08-26-96	260000	4000	6100	4200	24000	<2000^	--	--	--
MW-3	11-20-96	20.11	6.26	13.85	ND	SSE	0.004	11-20-96	190000	3200	5800	3300	20000	<1000^	--	--	--
MW-3	03-24-97	22.99	6.94	16.05	ND	SE	0.013	03-24-97	430000	2700	7600	7000	39000	<5000^	--	--	--
MW-4	03-17-95	20.75	6.65	14.10	ND	WSW	0.006	03-17-95	16000	1800	970	310	2500	--	--	--	--
MW-4	06-01-95	20.75	7.25	13.50	ND	SW	0.003	06-01-95	16000	2800	870	380	2700	--	--	--	--
MW-4	08-31-95	20.75	7.75	13.00	ND	SSW	0.005	08-31-95	9000	2000	270	270	1400	<100^	--	--	--
MW-4	11-27-95	20.75	7.87	12.88	ND	SSW	0.004	11-27-95	3800	890	130	130	550	--	--	--	--
MW-4	02-22-96	20.75	7.29	13.46	ND	NW	0.007	03-14-96	940	150	82	19	130	<20^	--	--	--
MW-4	05-20-96	20.75	7.30	13.45	ND	SW	0.007	05-21-96	6700	1100	330	120	1100	<100^	--	--	--
MW-4	08-26-96	20.75	7.57	13.18	ND	SSW	0.004	08-26-96	14000	2400	510	350	2100	<100^	--	--	--
MW-4	11-20-96	20.75	7.89	12.86	ND	SSE	0.004	11-20-96	420	55	17	11	62	<3	--	--	--
MW-4	03-24-97	22.38	6.90	15.48	ND	SE	0.013	03-24-97	6800	620	150	81	1300	<50^	--	--	--

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MW-5	03-17-95	20.90	5.51	15.39	ND	WSW	0.006	03-17-95	48000	6400	2000	740	5100	--	--	--	--
MW-5	06-01-95	20.90	6.55	14.35	ND	SW	0.003	06-01-95	76000	11000	5400	1400	7700	--	--	--	--
MW-5	08-31-95	20.90	6.80	14.10	ND	SSW	0.005	08-31-95	53000	12000	1600	1000	6000	<500^	--	--	--
MW-5	11-27-95	20.90	7.13	13.77	ND	SSW	0.004	11-27-95	43000	7900	3300	950	4900	--	--	--	--
MW-5	02-22-96	20.90	5.12	15.78	ND	NW	0.007	03-14-96	52000	9100	3300	940	5000	<500^	--	--	--
MW-5	05-20-96	20.90	5.87	15.03	ND	SW	0.007	05-21-96	55000	9300	3800	1100	5400	<500^	--	--	--
MW-5	08-26-96	20.90	7.15	13.75	ND	SSW	0.004	08-26-96	47000	5300	2100	780	3200	<300^	--	--	--
MW-5	11-20-96	20.90	6.88	14.02	ND	SSE	0.004	11-20-96	53000	8700	5700	920	4400	<500^	--	--	--
MW-5	03-24-97	22.45	7.13	15.32	ND	SE	0.013	03-24-97	39000	8200	3200	720	3100	<500^	--	--	--
MW-6	03-17-95	22.08	6.66	15.42	ND	WSW	0.006	03-17-95	45000	9300	<100^	1900	3600	--	--	--	--
MW-6	06-01-95	22.08	7.60	14.48	ND	SW	0.003	06-01-95	23000	5600	<50^	1300	1900	--	--	--	--
MW-6	08-31-95	22.08	7.92	14.16	ND	SSW	0.005	08-31-95	26000	8000	<100^	1900	900	<500^	--	--	--
MW-6	11-27-95	22.08	8.21	13.87	ND	SSW	0.004	11-27-95	6700	1800	<20^	480	230	--	--	--	--
MW-6	02-22-96	22.08	6.21	15.87	ND	NW	0.007	03-14-96	17000	3100	69	810	1500	<300^	--	--	--
MW-6	05-20-96	22.08	7.07	15.01	ND	SW	0.007	05-21-96	16000	3700	<50^	1100	1100	<300^	--	--	--
MW-6	08-26-96	22.08	7.93	14.15	ND	SSW	0.004	08-26-96	23000	5800	<50^	2000	560	<300^	--	--	--
MW-6	11-20-96	22.08	8.02	14.06	ND	SSE	0.004	11-20-96	11000	3300	<50*	480	370	<300^	--	--	--
MW-6	03-24-97	22.77	7.95	14.82	ND	SE	0.013	03-24-97	9700	1900	<20^	800	270	<100^	--	--	--

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MW-7	03-17-95	22.89	7.68	15.21	ND	WSW	0.006	03-17-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-7	06-01-95	22.89	8.40	14.49	ND	SW	0.003	06-01-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-7	08-31-95	22.89	9.09	13.80	ND	SSW	0.005	08-31-95	<50	<0.5	<0.5	0.6	<0.5	<3	--	--	--
MW-7	11-27-95	22.89	9.15	13.74	ND	SSW	0.004	11-27-95	<50	<0.5	<0.5	0.9	<0.5	--	--	--	--
MW-7	02-22-96	22.89	7.44	15.45	ND	NW	0.007	03-14-96	110	1.4	<0.5	3.8	3	<3	--	--	--
MW-7	05-20-96	22.89	8.47	14.42	ND	SW	0.007	05-21-96	Not sampled: well sampled annually, during the first quarter								
MW-7	08-26-96	22.89	8.81	14.08	ND	SSW	0.004	08-26-96	Not sampled: well sampled annually, during the first quarter								
MW-7	11-20-96	22.89	9.17	13.72	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the first quarter								
MW-7	03-24-97	22.89	8.31	14.58	ND	SE	0.013	03-24-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-8	03-17-95	20.97	6.14	14.83	ND	WSW	0.006	03-17-95	5400	<5 ^A	<5 ^A	35	<5 ^A	--	--	--	--
MW-8	06-01-95	20.97	6.50	14.47	ND	SW	0.003	06-01-95	2600	<2.5 ^A	<2.5 ^A	15	<2.5 ^A	--	--	--	--
MW-8	08-31-95	20.97	7.35	13.62	ND	SSW	0.005	08-31-95	1400	<3 ^A	<3 ^A	5	<3 ^A	520	--	900	--
MW-8	11-27-95	20.97	7.60	13.37	ND	SSW	0.004	11-27-95	620	<0.5	<0.5	<0.5	0.5	--	560	900	510*
MW-8	02-22-96	20.97	5.35	15.62	ND	NW	0.007	03-14-96	5800	<5 ^A	<5 ^A	28	<5 ^A	110	--	1900	6800*
MW-8	05-20-96	20.97	5.92	15.05	ND	SW	0.007	05-21-96	6100	<5 ^A	<5 ^A	26	<5 ^A	240	--	--	--
MW-8	08-26-96	20.97	7.08	13.89	ND	SSW	0.004	08-26-96	970	<1 ^A	<1 ^A	3	<1 ^A	710	--	--	--
MW-8	11-20-96	20.97	7.01	13.96	ND	SSE	0.004	11-20-96	3900	<2.5 ^A	<2.5 ^A	12	<2.5 ^A	930	--	--	--
MW-8	03-24-97	20.89	7.33	13.56	ND	SE	0.013	03-24-97	1400	<10 ^A	<10 ^A	<10 ^A	12	1300	--	--	--

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MW-9	03-17-95	20.89	6.94	13.95	ND	WSW	0.006	03-17-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-9	06-01-95	20.89	8.15	12.74	ND	SW	0.003	06-01-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-9	08-31-95	20.89	8.10	12.79	ND	SSW	0.005	08-31-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-9	11-27-95	20.89	8.38	12.51	ND	SSW	0.004	11-27-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-9	02-22-96	20.89	7.36	13.53	ND	NW	0.007	03-14-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-9	05-20-96	20.89	7.81	13.08	ND	SW	0.007	05-21-96	Not sampled: well sampled semi-annually, during the first and third quarters								
MW-9	08-26-96	20.89	8.00	12.89	ND	SSW	0.004	08-26-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-9	11-20-96	20.89	7.06	13.83	ND	SSE	0.004	11-20-96	Not sampled: well sampled semi-annually, during the first and third quarters								
MW-9	03-24-97	22.26	7.74	14.52	ND	SE	0.013	03-24-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-10	03-17-95	21.12	6.26	14.86	ND	WSW	0.006	03-17-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-10	06-01-95	21.12	7.63	13.49	ND	SW	0.003	06-01-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-10	08-31-95	21.12	8.17	12.95	ND	SSW	0.005	08-31-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-10	11-27-95	21.12	8.38	12.74	ND	SSW	0.004	11-27-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-10	02-22-96	21.12	5.41	15.71	ND	NW	0.007	03-14-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-10	05-20-96	21.12	6.78	14.34	ND	SW	0.007	05-21-96	Not sampled: well sampled semi-annually, during the first and third quarters								
MW-10	08-26-96	21.12	8.00	13.12	ND	SSW	0.004	08-26-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-10	11-20-96	21.12	7.81	13.31	ND	SSE	0.004	11-20-96	Not sampled: well sampled semi-annually, during the first and third quarters								
MW-10	03-24-97	21.33	7.87	13.46	ND	SE	0.013	03-24-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--

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MW-11	03-17-95	22.38	6.94	15.44	ND	WSW	0.006	03-17-95	100	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-11	06-01-95	22.38	7.90	14.48	ND	SW	0.003	06-01-95	210	<0.5	<0.5	0.9	0.7	--	--	--	--
MW-11	08-31-95	22.38	8.18	14.20	ND	SSW	0.005	08-31-95	680	<0.5	<0.5	4	1.8	<3	--	--	--
MW-11	11-27-95	22.38	8.48	13.90	ND	SSW	0.004	11-27-95	340	<0.5	<0.5	2.2	1.6	--	--	--	--
MW-11	02-22-96	22.38	6.63	15.75	ND	NW	0.007	03-14-96	150	<0.5	<0.5	<0.8^	0.8	<3	--	--	--
MW-11	05-20-96	22.38	7.25	15.13	ND	SW	0.007	05-21-96	Not sampled: well sampled annually, during the first quarter								
MW-11	08-26-96	22.38	8.22	14.16	ND	SSW	0.004	08-26-96	Not sampled: well sampled annually, during the first quarter								
MW-11	11-20-96	22.38	8.37	14.01	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the first quarter								
MW-11	03-24-97	20.97	8.15	12.82	ND	SE	0.013	03-24-97	63	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-12	03-17-95	22.77	7.09	15.68	ND	WSW	0.006	03-17-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-12	06-01-95	22.77	8.40	14.37	ND	SW	0.003	06-01-95	Not sampled: well sampled semi-annually, during the first and third quarters								
MW-12	08-31-95	22.77	8.55	14.22	ND	SSW	0.005	08-31-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-12	11-27-95	22.77	8.95	13.82	ND	SSW	0.004	11-27-95	Not sampled: well sampled semi-annually, during the first and third quarters								
MW-12	02-22-96	22.77	6.81	15.96	ND	NW	0.007	03-14-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-12	05-20-96	22.77	7.56	15.21	ND	SW	0.007	05-21-96	Not sampled: well sampled annually, during the first quarter								
MW-12	08-26-96	22.77	8.63	14.14	ND	SSW	0.004	08-26-96	Not sampled: well sampled annually, during the first quarter								
MW-12	11-20-96	22.77	8.38	14.39	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the first quarter								
MW-12	03-24-97	20.11	8.75	11.36	ND	SE	0.013	03-24-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--

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MW-13	03-17-95	22.45	6.91	15.54	ND	WSW	0.006	03-17-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-13	06-01-95	22.45	7.72	14.73	ND	SW	0.003	06-01-95	Not sampled: well sampled annually, during the first quarter								
MW-13	08-31-95	22.45	7.58	14.87	ND	SSW	0.005	08-31-95	Not sampled: well sampled annually, during the first quarter								
MW-13	11-27-95	22.45	7.98	14.47	ND	SSW	0.004	11-27-95	Not sampled: well sampled annually, during the first quarter								
MW-13	02-22-96	22.45	6.71	15.74	ND	NW	0.007	03-14-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-13	05-20-96	22.45	6.98	15.47	ND	SW	0.007	05-21-96	Not sampled: well sampled annually, during the first quarter								
MW-13	08-26-96	22.45	7.85	14.60	ND	SSW	0.004	08-26-96	Not sampled: well sampled annually, during the first quarter								
MW-13	11-20-96	22.45	7.76	14.69	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the first quarter								
MW-13	03-24-97	20.75	7.85	12.90	ND	SE	0.013	03-24-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-14	03-17-95	22.99	8.17	14.82	ND	WSW	0.006	03-17-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-14	06-01-95	22.99	8.57	14.42	ND	SW	0.003	06-01-95	Not sampled: well sampled annually, during the first quarter								
MW-14	08-31-95	22.99	9.05	13.94	ND	SSW	0.005	08-31-95	Not sampled: well sampled annually, during the first quarter								
MW-14	11-27-95	22.99	9.19	13.80	ND	SSW	0.004	11-27-95	Not sampled: well sampled annually, during the first quarter								
MW-14	02-22-96	22.99	6.52	16.47	ND	NW	0.007	03-14-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-14	05-20-96	22.99	7.88	15.11	ND	SW	0.007	05-21-96	Not sampled: well sampled annually, during the first quarter								
MW-14	08-26-96	22.99	8.83	14.16	ND	SSW	0.004	08-26-96	Not sampled: well sampled annually, during the first quarter								
MW-14	11-20-96	22.99	8.95	14.04	ND	SSE	0.004	11-20-96	Not sampled: well sampled annually, during the first quarter								
MW-14	03-24-97	20.90	8.98	11.92	ND	SE	0.013	03-24-97	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--

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MW-15	03-17-95	19.19	5.21	13.98	ND	WSW	0.006	03-17-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--
MW-15	06-01-95	19.19	5.84	13.35	ND	SW	0.003	06-01-95	Not sampled: well sampled semi-annually, during the first and third quarters								
MW-15	08-31-95	19.19	6.18	13.01	ND	SSW	0.005	08-31-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--	--
MW-15	11-27-95	19.19	6.42	12.77	ND	SSW	0.004	11-27-95	Not sampled: well sampled semi-annually, during the first and third quarters								
MW-15	02-22-96	19.19	4.84	14.35	ND	NW	0.007	03-14-96	<50	<0.5	<0.5	<0.5	<0.5	12	--	--	--
MW-15	05-20-96	19.19	5.31	13.88	ND	SW	0.007	05-21-96	Not sampled: well sampled semi-annually, during the first and third quarters								
MW-15	08-26-96	19.19	6.05	13.14	ND	SSW	0.004	08-26-96	<50	<0.5	<0.5	<0.5	<0.5	8	--	--	--
MW-15	11-20-96	19.19	5.46	13.73	ND	SSE	0.004	11-20-96	Not sampled: well sampled semi-annually, during the first and third quarters								
MW-15	03-24-97	22.08	6.00	16.08	ND	SE	0.013	03-24-97	<50	<0.5	<0.5	<0.5	<0.5	15	--	--	--

Table 2
Historical Groundwater Elevation and Analytical Data
Petroleum Hydrocarbons and Their Constituents
1995 - Present***

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Date: 06-12-97

Well Designation	Water Level Field Date	Top of Casing Elevation	Depth to Water	Groundwater Elevation	Floating Product Thickness	Groundwater Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG LUFT Method	Benzene EPA 8020	Toluene EPA 8020	Ethylbenzene EPA 8020	Total Xylenes EPA 8020	MTBE EPA 8020	MTBE EPA 8240	TRPH EPA 418.1	TPHD LUFT Method
		ft-MSL	feet	ft-MSL	feet	MWN	ft/ft		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L

ft-MSL: elevation in feet, relative to mean sea level

MWN: ground-water flow direction and gradient apply to the entire monitoring well network

ft/ft: foot per foot

TPHG: total petroleum hydrocarbons as gasoline, California DHS LUFT Method

µg/L: micrograms per liter

EPA: United States Environmental Protection Agency

MTBE: Methyl tert-butyl ether

TRPH: total recoverable petroleum hydrocarbons

TPHD: total petroleum hydrocarbons as diesel, California DHS LUFT Method

ND: none detected

SW: southwest

WSW: west-southwest

SSW: south-southwest

SSE: south-southeast

NW: northwest

- - : not analyzed

^: method reporting limit was raised due to: (1) high analyte concentration requiring sample dilution, or (2) matrix interference

*: chromatogram fingerprint is not characteristic of diesel

** : {corrected elevation (Z')} = Z + (h * 0.73) where: Z = measured elevation, h = floating product thickness, 0.73 = density ratio of oil to water

***: For previous historical groundwater elevation and analytical data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results, ARCO Service Station 601, San Leandro, California*, (EMCON, March 14, 1996).

Table 3
Historical Groundwater Analytical Data
Metals*
1994 - Present**

ARCO Service Station 601

712 Lewelling Boulevard, San Leandro, California

Date: 06-12-97

Well Designation	Water Sample Field Date		Cadmium EPA 6010 µg/L	Chromium EPA 6010 µg/L	Lead EPA 7421 µg/L	Nickel EPA 6010 µg/L	Zinc EPA 6010 µg/L
MW-1	03-17-95		<5	20	20	<40	60
MW-1	06-01-95		<5	20	22	70	100
MW-1	08-31-95	Not sampled: well contained floating product					
MW-1	11-27-95	Not sampled: well contained floating product					
MW-1	02-22-96	Not sampled: well contained floating product					
MW-1	05-20-96		0.006	<0.01	<0.005	<0.02	<0.02
MW-1	08-26-96		--	--	--	--	--
MW-1	11-20-96		--	--	--	--	--
MW-1	03-24-97		--	--	--	--	--
MW-2	03-23-92	Not analyzed: sampling for additional parameters was discontinued					
MW-3	03-23-92	Not analyzed: sampling for additional parameters was discontinued					
MW-4	06-10-91	Not analyzed: sampling for additional parameters was not initiated					
MW-5	06-08-92	Not analyzed: sampling for additional parameters was discontinued					
MW-6	06-10-91	Not analyzed: sampling for additional parameters was not initiated					
MW-7	06-10-91	Not analyzed: sampling for additional parameters was not initiated					
MW-8	03-17-95	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8					
MW-8	06-01-95	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8					
MW-8	08-31-95		<5	40	16	50	90
MW-8	11-27-95		<5	130	77	170	280
MW-8	02-22-96		<5	30	7	40	60
MW-8	05-20-96	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8					
MW-8	08-26-96		--	--	--	--	--
MW-8	11-20-96		--	--	--	--	--
MW-8	03-24-97		--	--	--	--	--
MW-9	06-11-93	Not analyzed: sampling for additional parameters was not initiated					
MW-10	06-11-93	Not analyzed: sampling for additional parameters was not initiated					
MW-11	11-16-92	Not analyzed: sampling for additional parameters was not initiated					
MW-12	11-16-92	Not analyzed: sampling for additional parameters was not initiated					
MW-13	11-16-92	Not analyzed: sampling for additional parameters was not initiated					
MW-14	09-15-92	Not analyzed: sampling for additional parameters was not initiated					
MW-15	05-13-93	Not analyzed: sampling for additional parameters was not initiated					

EPA: United States Environmental Protection Agency

µg/L: micrograms per liter

--: not analyzed

*: Historically samples were analyzed for total metals. Since March 14, 1996, the samples were filtered and analyzed for dissolved metals.

** : For previous historical analytical data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results, ARCO Service Station 601, San Leandro, California*, (EMCON, March 14, 1996).

Table 4
Historical Groundwater Analytical Data
Volatile and Semivolatile Organic Compounds
1995 - Present*

ARCO Service Station 601

712 Lewelling Boulevard, San Leandro, California

Date: 06-12-97

Well Designation	Water Sample Field Date	Volatile Organic Compounds by EPA Method 601/8010 or 624/8240							Semivolatile Organic Compounds by EPA Method 3520/8270				
		Methylene Chloride µg/L	1,2-Dichloro-ethane µg/L	1,1-Dichloro-ethane µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Total Xylenes µg/L	Naphthalene µg/L	2-Methyl-naphthalene µg/L	Bis (2-ethylhexyl) Phthalate µg/L	Phenol µg/L	2,4-Di-methyl-phenol µg/L
MW-1	03-17-95	--	--	--	--	--	--	--	1300	730	<50	ND	150
MW-1	06-01-95	--	--	--	--	--	--	--	2200	1700	<100	240	<100
MW-1	08-31-95	Not sampled: well contained floating product											
MW-1	11-27-95	Not sampled: well contained floating product											
MW-1	03-14-96	Not sampled: well contained floating product											
MW-1	05-21-96	--	--	--	--	--	--	--	1200	860	<50	<50	<50
MW-1	08-26-96	--	--	--	--	--	--	--	2300	1800	<500	<500	<1000
MW-1	11-20-96	--	--	--	--	--	--	--	590	250	91	<50^	<100^
MW-1	03-24-97	--	--	--	--	--	--	--	730	610	<50^	<50^	<100^
MW-8	03-17-95	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	06-01-95	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	08-31-95	--	--	--	--	--	--	--	62	8	<5	<5	<5
MW-8	11-27-95	--	--	--	--	--	--	--	15	<5	<5	<5	<5
MW-8	03-14-96	--	--	--	--	--	--	--	400	55	<50	<50	<50
MW-8	05-21-96	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	08-26-96	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											
MW-8	11-20-96	Not analyzed: well MW-1 was sampled for additional parameters in lieu of well MW-8											

Table 4
Historical Groundwater Analytical Data
Volatile and Semivolatile Organic Compounds
1995 - Present*

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Date: 06-12-97

Well Designation	Water Sample Field Date	Volatile Organic Compounds by EPA Method 601/8010 or 624/8240						Semivolatile Organic Compounds by EPA Method 3520/8270				
		Methylene Chloride µg/L	1,2-Dichloro- ethane µg/L	1,1-Dichloro- ethane µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Total Xylenes µg/L	Naphthalene µg/L	2-Methyl- naphthalene µg/L	Bis (2-ethylhexyl) Phthalate µg/L	Phenol µg/L

EPA: United States Environmental Protection Agency

µg/L: micrograms per liter

--: not analyzed

ND: not detected at or above the method detection limit

^: method reporting limit was raised due to: (1) high analyte concentration requiring sample dilution, or (2) matrix interference

*: For previous historical analytical data please refer to *Fourth Quarter 1995 Groundwater Monitoring Program Results, ARCO Service Station 601, San Leandro, California*, (EMCON, March 14, 1996).

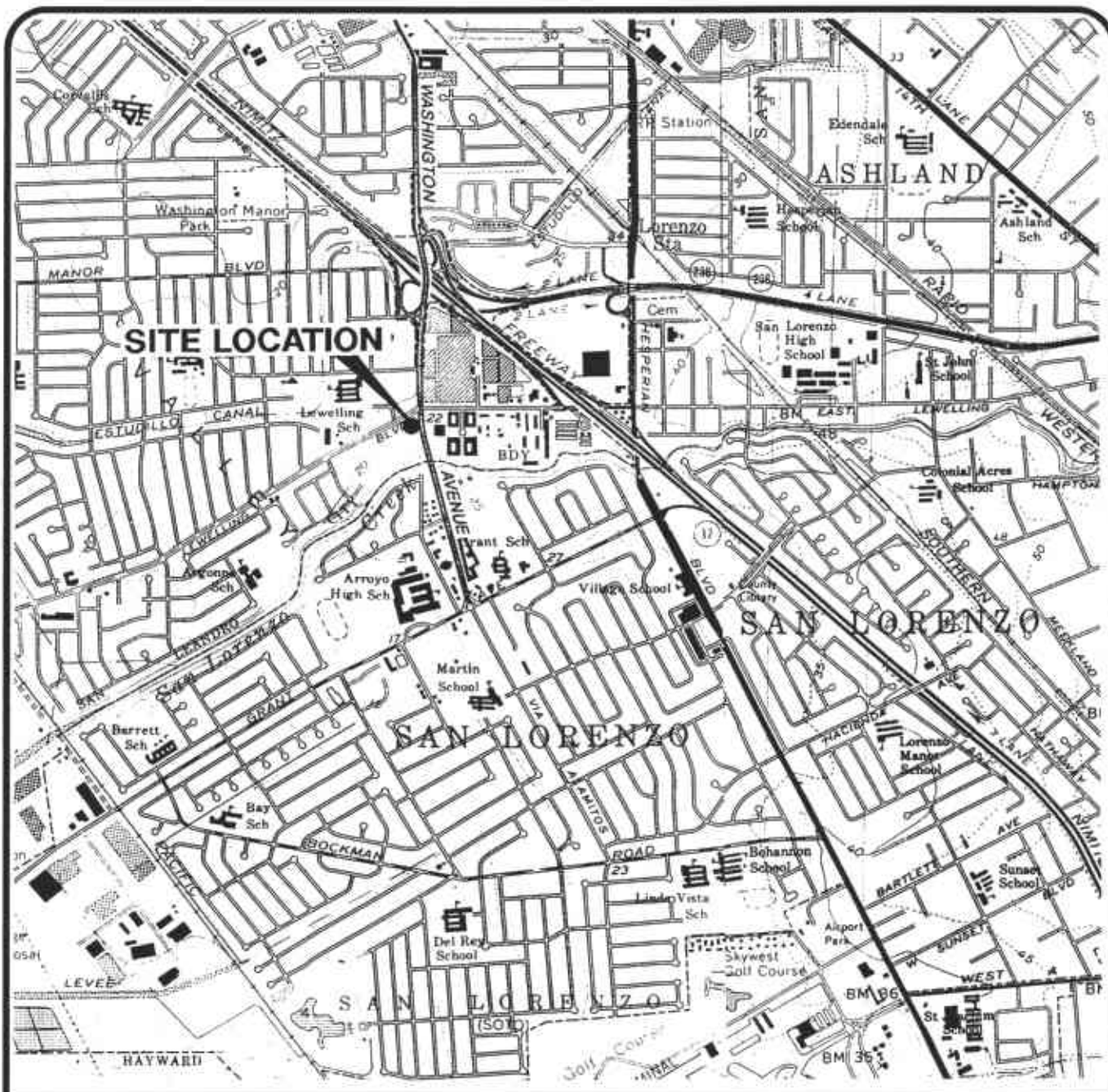
Table 5
Approximate Cumulative Floating Product Recovered

ARCO Service Station 601
712 Lewelling Boulevard, San Leandro, California

Date: 06-12-97

Well Design- nation	Date	Floating Product Recovered gallons
MW-1	1991	3.43
MW-1	1992	0.02
MW-1	1993	0.00
MW-1	1994	0.00
MW-1	1995	0.00
MW-1	1996	0.00
MW-1	1997	0.00
1991 to 1997 Total:		3.45

EA-SANJOSE-CAD/DRAWINGS: I:\02002\SITELOC.dwg, Xrefs: <NONE>
 Scale: 1" = 1.00' DimScale: 1" = 1.00' Date: 3/12/97 Time: 5:19 PM Operator: KAJ



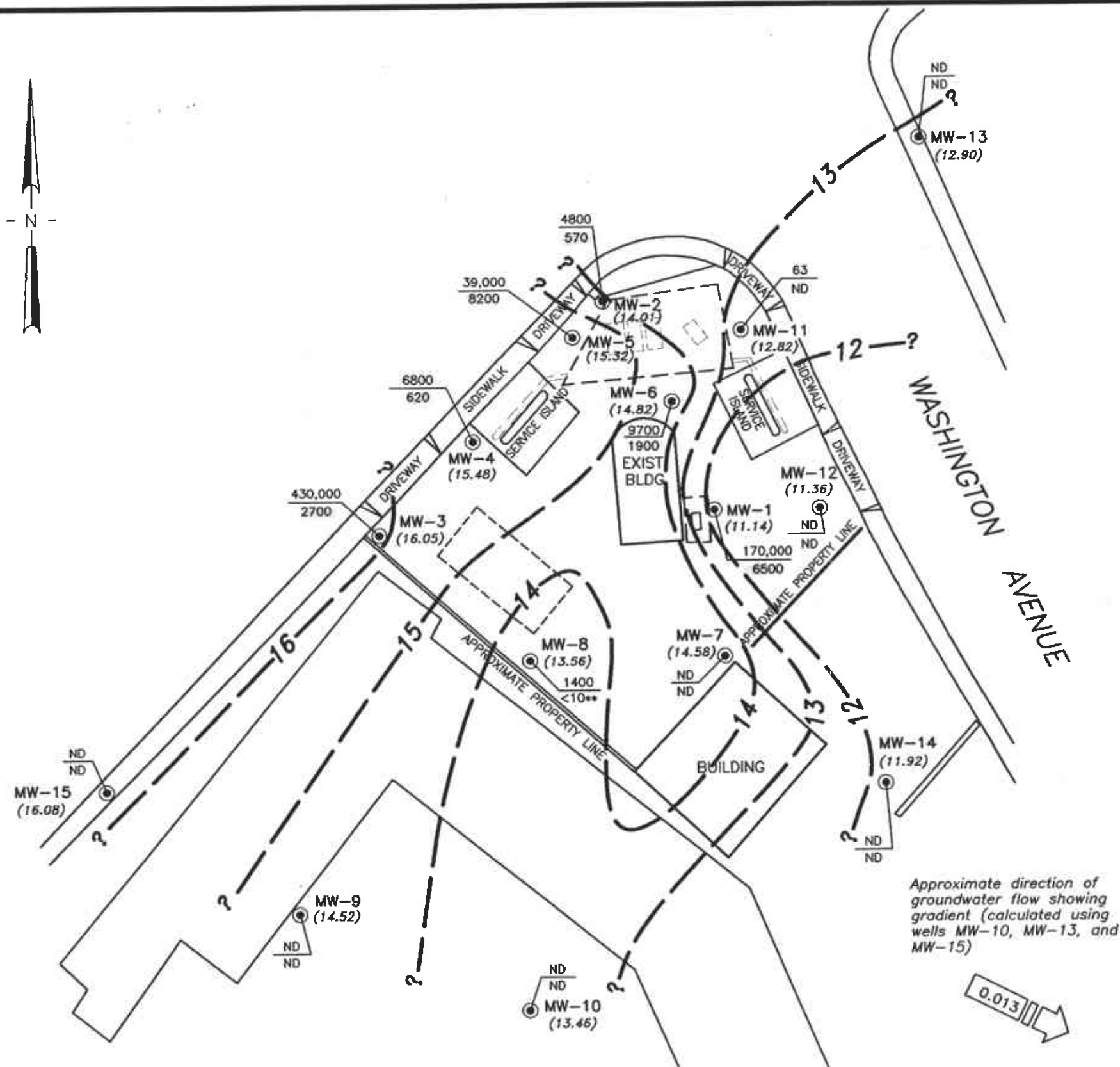
Base map from USGS 7.5' Quad. Maps:
 Hayward and San Leandro, California.
 Photorevised 1980.

0 2000 4000
 SCALE IN FEET



DATE APR. 1997
 DWN KAJ
 APP _____
 REV _____
 PROJECT NO.
 805-121.005

FIGURE 1
 ARCO PRODUCTS COMPANY
 SERVICE STATION 601, 712 LEWELLING BLVD.
 SAN LEANDRO, CALIFORNIA
**QUARTERLY GROUNDWATER MONITORING
 SITE LOCATION**



EXPLANATION

- Groundwater monitoring well
- Vapor extraction well
- Former underground gasoline storage tank
- Existing underground gasoline storage tank
- Approximate limit of gasoline tank excavation
- === Former product line
- (11.14) Groundwater elevation (Ft.-MSL) measured 3/24/97
- ?- Groundwater elevation contour (Ft.-MSL)
- 170,000 / 6500 TPHG, concentration in groundwater (ug/L); sampled 3/24/97
- 170,000 / 6500 Benzene concentration in groundwater (ug/L); sampled 3/24/97
- ND Not detected at or above the method reporting limit for TPHG (50 ug/L) or benzene (0.5 ug/L)
- NS Not sampled; not scheduled for chemical analysis
- ** Raised method reporting limit due to high analyte concentration requiring sample dilution

DATE MAY 1997
 DWN KMM
 APP
 REV 0
 PROJECT NO.
 20805-121.005

FIGURE 2
 ARCO PRODUCTS COMPANY
 SERVICE STATION 601,712 LEWELLING BLVD.
 SAN LEANDRO, CALIFORNIA
QUARTERLY GROUNDWATER MONITORING
GROUNDWATER DATA - 1ST QUARTER 1997

APPENDIX A

ANALYTICAL RESULTS AND CHAIN OF CUSTODY DOCUMENTATION, FIRST QUARTER 1997 GROUNDWATER MONITORING EVENT



April 9, 1997

Service Request No.: S9700548

Mr. John Young
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

RE: 601 SAN LEANDRO/20805-121.004/TO#19350.00

Dear Mr. Young:

The following pages contain analytical results for sample(s) received by the laboratory on March 26, 1997. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 17, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,

A handwritten signature in black ink, appearing to read "Steven L. Green", is written over a horizontal line.

Steven L. Green
Project Chemist

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
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
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. 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
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
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 method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

ACRONLST.DOC 7/14/95

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00
Sample Matrix: Water

Service Request: S9700548
Date Collected: 3/24/97
Date Received: 3/26/97
Date Extracted: 3/27/97

Base Neutral/Acid Semivolatile Organic Compounds
 EPA Methods 3510/8270B
 Units: ug/L (ppb)

Sample Name:	MW-1 (11)	Method Blank
Lab Code:	S9700548-013 M1	S970327-WB1
Date Analyzed:	4/7/97	3/31/97

MRL

N-Nitrosodimethylamine	5	<50	ND
Aniline	5	<50	ND
Bis(2-chloroethyl) Ether	5	<50	ND
Phenol	5	<50	ND
2-Chlorophenol	5	<50	ND
1,3-Dichlorobenzene	5	<50	ND
1,4-Dichlorobenzene	5	<50	ND
1,2-Dichlorobenzene	5	<50	ND
Benzyl Alcohol	10	<100	ND
Bis(2-chloroisopropyl) Ether	5	<50	ND
2-Methylphenol	5	<50	ND
Hexachloroethane	10	<100	ND
N-Nitrosodi-n-propylamine	5	<50	ND
3- and 4-Methylphenol*	5	<50	ND
Nitrobenzene	5	<50	ND
Isophorone	5	<50	ND
2-Nitrophenol	5	<50	ND
2,4-Dimethylphenol	10	<100	ND
Bis(2-chloroethoxy)methane	5	<50	ND
2,4-Dichlorophenol	50	<500	ND
Benzoic Acid	50	<500	ND
1,2,4-Trichlorobenzene	5	<50	ND
Naphthalene	5	730	ND
4-Chloroaniline	5	<50	ND
Hexachlorobutadiene	10	<100	ND
4-Chloro-3-methylphenol	5	<50	ND
2-Methylnaphthalene	5	610	ND
Hexachlorocyclopentadiene	10	<100	ND

M1 The MRL was elevated because of matrix interferences.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00
Sample Matrix: Water

Service Request: S9700548
Date Collected: 3/24/97
Date Received: 3/26/97
Date Extracted: 3/27/97

Base Neutral/Acid Semivolatile Organic Compounds
 EPA Methods 3510/8270B
 Units: ug/L (ppb)

Sample Name:	MW-1 (11)	Method Blank
Lab Code:	S9700548-013 M1	S970327-WB1
Date Analyzed:	4/7/97	3/31/97

MRL

	MRL		
2,4,6-Trichlorophenol	5	<50	ND
2,4,5-Trichlorophenol	5	<50	ND
2-Chloronaphthalene	5	<50	ND
2-Nitroaniline	20	<200	ND
Acenaphthylene	5	<50	ND
Dimethyl Phthalate	5	<50	ND
2,6-Dinitrotoluene	5	<50	ND
Acenaphthene	5	<50	ND
3-Nitroaniline	20	<200	ND
2,4-Dinitrophenol	50	<500	ND
Dibenzofuran	5	<50	ND
4-Nitrophenol	50	<500	ND
2,4-Dinitrotoluene	50	<500	ND
Fluorene	5	<50	ND
4-Chlorophenyl Phenyl Ether	5	<50	ND
Diethyl Phthalate	5	<50	ND
4-Nitroaniline	20	<200	ND
2-Methyl-4,6-dinitrophenol	20	<200	ND
N-Nitrosodiphenylamine	5	<50	ND
4-Bromophenyl Phenyl Ether	5	<50	ND
Hexachlorobenzene	5	<50	ND
Pentachlorophenol	30	<300	ND
Phenanthrene	30	<300	ND
Anthracene	5	<50	ND
Di-n-butyl Phthalate	5	<50	ND
Fluoranthene	5	<50	ND
Pyrene	5	<50	ND
Butylbenzyl Phthalate	5	<50	ND

M1 The MRL was elevated because of matrix interferences.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00
Sample Matrix: Water

Service Request: S9700548
Date Collected: 3/24/97
Date Received: 3/26/97
Date Extracted: 3/27/97

Base Neutral/Acid Semivolatile Organic Compounds
 EPA Methods 3510/8270B
 Units: ug/L (ppb)

Sample Name:	MW-1 (11)	Method Blank
Lab Code:	S9700548-013 M1	S970327-WB1
Date Analyzed:	4/7/97	3/31/97

MRL

3,3'-Dichlorobenzidine	20	<200	ND
Benz(a)anthracene	5	<50	ND
Chrysene	5	<50	ND
Bis(2-ethylhexyl) Phthalate	5	<50	ND
Di-n-octyl Phthalate	5	<50	ND
Benzo(b)fluoranthene	5	<50	ND
Benzo(k)fluoranthene	5	<50	ND
Benzo(a)pyrene	5	<50	ND
Indeno(1,2,3-cd)pyrene	5	<50	ND
Dibenz(a,h)anthracene	5	<50	ND
Benzo(g,h,i)perylene	5	<50	ND

Quantified as 4-Methylphenol.
 M1 The MRL was elevated because of matrix interferences.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00
Sample Matrix: Water

Service Request: S9700548
Date Collected: 3/24/97
Date Received: 3/26/97
Date Extracted: NA

BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name:	MW-3 (12)	MW-15 (10)	MW-12 (11)
Lab Code:	S9700548-001	S9700548-002	S9700548-003
Date Analyzed:	4/5/97	4/4/97	4/4/97

Analyte	MRL			
TPH as Gasoline	50	430000	ND	ND
Benzene	0.5	2700	ND	ND
Toluene	0.5	7600	ND	ND
Ethylbenzene	0.5	7000	ND	ND
Total Xylenes	0.5	39000	ND	ND
Methyl <i>tert</i> -Butyl Ether	3	<5000 C1	15	ND

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00
Sample Matrix: Water

Service Request: S9700548
Date Collected: 3/24/97
Date Received: 3/26/97
Date Extracted: NA

BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name:	MW-13 (13)	MW-14 (13)	MW-7 (9)
Lab Code:	S9700548-004	S9700548-005	S9700548-006
Date Analyzed:	4/4/97	4/4/97	4/4/97

Analyte	MRL			
TPH as Gasoline	50	ND	ND	ND
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	ND	ND	ND
Methyl <i>tert</i> -Butyl Ether	3	ND	ND	ND

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00
Sample Matrix: Water

Service Request: S9700548
Date Collected: 3/24/97
Date Received: 3/26/97
Date Extracted: NA

BTEX, MTBE and TPH as Gasoline
 EPA Methods 5030/8020/California DHS LUFT Method
 Units: ug/L (ppb)

Sample Name:	MW-11 (11)	MW-4 (8)	MW-8 (10)
Lab Code:	S9700548-007	S9700548-008	S9700548-009
Date Analyzed:	4/4/97	4/7/97	4/4/97

Analyte	MRL			
TPH as Gasoline	50	63	6800	1400
Benzene	0.5	ND	620	<10 C1
Toluene	0.5	ND	150	<10 C1
Ethylbenzene	0.5	ND	81	<10 C1
Total Xylenes	0.5	ND	1300	12
Methyl <i>tert</i> -Butyl Ether	3	ND	<50 C1	1300

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00
Sample Matrix: Water

Service Request: S9700548
Date Collected: 3/24/97
Date Received: 3/26/97
Date Extracted: NA

BTEX, MTBE and TPH as Gasoline
 EPA Methods 5030/8020/California DHS LUFT Method
 Units: ug/L (ppb)

Sample Name:	MW-2 (12)	MW-6 (8)	MW-5 (10)
Lab Code:	S9700548-010	S9700548-011	S9700548-012
Date Analyzed:	4/5/97	4/5/97	4/5/97

Analyte	MRL			
TPH as Gasoline	50	4800	9700	39000
Benzene	0.5	570	1900	8200
Toluene	0.5	6	<20 C1	3200
Ethylbenzene	0.5	71	800	720
Total Xylenes	0.5	32	270	3100
Methyl <i>tert</i> -Butyl Ether	3	67	<100 C1	<500 C1

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00
Sample Matrix: Water

Service Request: S9700548
Date Collected: 3/24/97
Date Received: 3/26/97
Date Extracted: NA

BTEX, MTBE and TPH as Gasoline
 EPA Methods 5030/8020/California DHS LUFT Method
 Units: ug/L (ppb)

Sample Name:	MW-1 (11)	Method Blank	Method Blank
Lab Code:	S9700548-013	S9700404-WB1	S9700405-WB1
Date Analyzed:	4/5/97	4/4/97	4/5/97

Analyte	MRL			
TPH as Gasoline	50	170000	ND	ND
Benzene	0.5	6500	ND	ND
Toluene	0.5	<200 C1	ND	ND
Ethylbenzene	0.5	2400	ND	ND
Total Xylenes	0.5	9900	ND	ND
Methyl <i>tert</i> -Butyl Ether	3	<1000 C1	ND	ND

C1 The MRL was elevated due to high analyte concentration requiring sample dilution.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00
Sample Matrix: Water

Service Request: S9700548
Date Collected: NA
Date Received: NA
Date Extracted: NA

BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name: Method Blank
Lab Code: S9700407-WB1
Date Analyzed: 4/7/97

Analyte	MRL	
TPH as Gasoline	50	ND
Benzene	0.5	ND
Toluene	0.5	ND
Ethylbenzene	0.5	ND
Total Xylenes	0.5	ND
Methyl <i>tert</i> -Butyl Ether	3	ND

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
 Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00
 Sample Matrix: Water

Service Request: S9700548
 Date Collected: 3/24/97
 Date Received: 3/26/97
 Date Extracted: 3/27/97
 Date Analyzed: NA

Surrogate Recovery Summary
 Base Neutral/Acid Semivolatile Organic Compounds
 EPA Methods 3510/8270B

Sample Name	Lab Code	P e r c e n t			R e c o v e r y		
		2FP	PHL	NBZ	FBP	TBP	TPH
MW-1 (11)	S9700548-013	9	2	43 S1	75	38	70
MW-1(11) (MS)	S9700548-013MS	15	18	52	90 S1	45	87
MW-1(11) (DMS)	S9700548-013DMS	16	20	46 S1	84	45	77
Method Blank	S970327-WB1	22	25	48	68	63	76

CAS Acceptance Limits: D-50 D-58 47-100 53-85 D-119 50-107

2FP 2-Fluorophenol
 PHL Phenol-D6
 NBZ Nitrobenzene-D5
 FBP 2-Fluorobiphenyl
 TBP 2,4,6-Tribromophenol
 TPH Terphenyl-D14

S1 Surrogate recovery out of control limits due to matrix interference.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00
Sample Matrix: Water

Service Request: S9700548
Date Collected: 3/24/97
Date Received: 3/26/97
Date Extracted: 3/27/97
Date Analyzed: 4/7/97

Matrix Spike/Duplicate Matrix Spike Summary
Base Neutral/Acid Semivolatile Organic Compounds
EPA Methods 3510/8270B
Units: µg/L (ppb)

Sample Name: MW-1(11)
Lab Code: S9700548-013MS, DMS

Analyte	Percent Recovery								Relative Percent Difference
	Spike Level		Sample Result	Spike Result		CAS Acceptance Limits			
	MS	DMS		MS	DMS	MS	DMS		
Phenol	200	200	ND	60	70	30	35	12-89	15
2-Chlorophenol	200	200	ND	150	140	75	70	27-123	7
1,4-Dichlorobenzene	100	100	ND	88	82	88	82	36-97	7
N-Nitrosodi-n-propylamine	100	100	ND	74	110	74	110	41-116	39
1,2,4-Trichlorobenzene	100	100	ND	90	82	90	82	39-98	9
4-Chloro-3-methylphenol	200	200	ND	82	76	41	38	23-97	8
Acenaphthene	100	100	ND	95	87	95	87	46-118	9
4-Nitrophenol	200	200	ND	5 L	4 L	2	2	10-80	22
2,4-Dinitrotoluene	100	100	ND	45	45	45	45	24-96	< 1
Pentachlorophenol	200	200	ND	0 L	0.2 L	0	0	9-103	NA
Pyrene	100	100	ND	95	86	95	86	26-127	10

L Outside of acceptance limits because of matrix effects.
 NA Not Applicable because of sample matrix.

COLUMBIA ANALYTICAL SERVICES, INC.**QA/QC Report**

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00
Sample Matrix: Water

Service Request: S9700548
Date Collected: 3/24/97
Date Received: 3/26/97
Date Extracted: NA
Date Analyzed: NA

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

Sample Name	Lab Code	PID Detector	FID Detector
		Percent Recovery 4-Bromofluorobenzene	Percent Recovery α,α,α -Trifluorotoluene
MW-3 (12)	S9700548-001	98	96
MW-15 (10)	S9700548-002	99	86
MW-12 (11)	S9700548-003	98	87
MW-13 (13)	S9700548-004	98	76
MW-14 (13)	S9700548-005	100	86
MW-7 (9)	S9700548-006	101	84
MW-11 (11)	S9700548-007	101	95
MW-4 (8)	S9700548-008	97	93
MW-8 (10)	S9700548-009	99	87
MW-2 (12)	S9700548-010	94	99
MW-6 (8)	S9700548-011	93	95
MW-5 (10)	S9700548-012	96	88
MW-1 (11)	S9700548-013	101	86
Method Blank	S9700404-WB1	97	91
Method Blank	S9700405-WB1	97	94
Method Blank	S9700407-WB1	96	90
Batch QC MS	S9700547-001MS	103	95
Batch QC DMS	S9700547-001DMS	101	91

CAS Acceptance Limits:

69-116

69-116

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	Service Request:	S9700548
Project:	601 SAN LEANDRO/20805-121.004/TO#19350.00	Date Collected:	3/24/97
Sample Matrix:	Water	Date Received:	3/26/97
		Date Extracted:	NA
		Date Analyzed:	4/4/97

Matrix Spike/Duplicate Matrix Spike Summary

BTE

EPA Methods 5030/8020

Units: ug/L (ppb)

Sample Name: Batch QC
Lab Code: S9700547-001MS, DMS

Analyte	Spike Level		Sample Result	Spike Result		Percent Recovery			Relative Percent Difference
	MS	DMS		MS	DMS	MS	DMS	CAS Acceptance Limits	
Benzene	25	25	ND	26	26	104	104	75-135	<1
Toluene	25	25	ND	26	26	104	104	73-136	<1
Ethylbenzene	25	25	ND	27	26	108	104	69-142	4

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00

Service Request: S9700548
Date Analyzed: 4/4/97

Initial Calibration Verification (ICV) Summary
BTEX, MTBE 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	100	85-115
Toluene	25	26	104	85-115
Ethylbenzene	25	26	104	85-115
Xylenes, Total	75	78	104	85-115
Gasoline	250	250	100	90-110
Methyl <i>tert</i> -Butyl Ether	25	24	96	85-115



April 9, 1997

Service Request No.: S9700547

Mr. John Young
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

RE: 601 SAN LEANDRO/20805-121.004/TO#19350.00

Dear Mr. Young:

The following pages contain analytical results for sample(s) received by the laboratory on March 26, 1997. Results of sample analyses are followed by Appendix A which contains sample custody documentation and quality assurance deliverables requested for this project. The work requested has been assigned the Service Request No. listed above. To help expedite our service, please refer to this number when contacting the laboratory.

Analytical results were produced by procedures consistent with Columbia Analytical Services' (CAS) Quality Assurance Manual (with any deviations noted). Signature of this CAS Analytical Report below confirms that pages 2 through 7, following, have been thoroughly reviewed and approved for release in accord with CAS Standard Operating Procedure ADM-DatRev3.

Please feel welcome to contact me should you have questions or further needs.

Sincerely,

Steven L. Green
Project Chemist

Greg Anderson
Regional QA Coordinator

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

A2LA	American Association for Laboratory Accreditation
ASTM	American Society for Testing and Materials
BOD	Biochemical Oxygen Demand
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CAM	California Assessment Metals
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
COD	Chemical Oxygen Demand
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
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
IC	Ion Chromatography
ICB	Initial Calibration Blank sample
ICP	Inductively Coupled Plasma atomic emission spectrometry
ICV	Initial Calibration Verification sample
J	Estimated concentration. The value is less than the MRL, but greater than or equal to the MDL. If the value is equal to the MRL, the result is actually <MRL before rounding.
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified
MBAS	Methylene Blue Active Substances
MCL	Maximum Contaminant Level. 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
MS	Matrix Spike
MTBE	Methyl tert-Butyl Ether
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 method reporting/detection limit (MRL/MDL)
NIOSH	National Institute for Occupational Safety and Health
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 18th Ed., 1992
STLC	Solubility Threshold Limit Concentration
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Ed., 1986 and as amended by Updates I, II, IIA, and IIB.
TCLP	Toxicity Characteristic Leaching Procedure
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
tr	Trace level. The concentration of an analyte that is less than the PQL but greater than or equal to the MDL. If the value is equal to the PQL, the result is actually <PQL before rounding.
TRPH	Total Recoverable Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)

ACRONLST.DOC 7/14/95

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00
Sample Matrix: Water

Service Request: S9700547
Date Collected: 3/24/97
Date Received: 3/26/97
Date Extracted: NA

BTEX, MTBE and TPH as Gasoline
EPA Methods 5030/8020/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name:	MW-9 (16)	MW-10 (18)	Method Blank
Lab Code:	S9700547-001	S9700547-002	S9700404-WB1
Date Analyzed:	4/4/97	4/4/97	4/4/97

Analyte	MRL			
TPH as Gasoline	50	ND	ND	ND
Benzene	0.5	ND	ND	ND
Toluene	0.5	ND	ND	ND
Ethylbenzene	0.5	ND	ND	ND
Total Xylenes	0.5	ND	ND	ND
Methyl <i>tert</i> -Butyl Ether	3	ND	ND	ND

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00
Sample Matrix: Water

Service Request: S9700547
Date Collected: 3/24/97
Date Received: 3/26/97
Date Extracted: NA
Date Analyzed: NA

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

Sample Name	Lab Code	PID Detector	FID Detector
		Percent Recovery 4-Bromofluorobenzene	Percent Recovery α,α,α -Trifluorotoluene
MW-9 (16)	S9700547-001	100	92
MW-10 (18)	S9700547-002	98	91
Method Blank	S9700404-WB1	97	91
MW-9 (16)	S9700547-001MS	103	95
MW-9 (16)	S9700547-001DMS	101	91

CAS Acceptance Limits: 69-116 69-116

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	Service Request:	S9700547
Project:	601 SAN LEANDRO/20805-121.004/TO#19350.00	Date Collected:	3/24/97
Sample Matrix:	Water	Date Received:	3/26/97
		Date Extracted:	NA
		Date Analyzed:	4/4/97

Matrix Spike/Duplicate Matrix Spike Summary

BTE

EPA Methods 5030/8020

Units: ug/L (ppb)

Sample Name: MW-5(16)
Lab Code: S9700547-001MS, DMS

Analyte	Spike Level		Sample Result	Spike Result		Percent Recovery			Relative Percent Difference
	MS	DMS		MS	DMS	MS	DMS	CAS Acceptance Limits	
Benzene	25	25	ND	26	26	104	104	75-135	<1
Toluene	25	25	ND	26	26	104	104	73-136	<1
Ethylbenzene	25	25	ND	27	26	108	104	69-142	4

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: ARCO Products Company
Project: 601 SAN LEANDRO/20805-121.004/TO#19350.00

Service Request: S9700547
Date Analyzed: 4/4/97

Initial Calibration Verification (ICV) Summary
BTEX, MTBE 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	100	85-115
Toluene	25	26	104	85-115
Ethylbenzene	25	26	104	85-115
Xylenes, Total	75	78	104	85-115
Gasoline	250	250	100	90-110
Methyl <i>tert</i> -Butyl Ether	25	24	96	85-115

ARCO Facility no. 601		City (Facility) San Leandro		Project manager (Consultant) John Young		Laboratory name CAS	
ARCO engineer PAUL SUPPLE		Telephone no. (ARCO)		Telephone no. (Consultant)		Fax no. (Consultant)	
Consultant name Emcon				Address (Consultant) 1921 Ringwood Ave.			
Contract number							

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	BTEX EPA 801/802	BTX/TPH EPA 801/802/803/805	TPH Modified 801.5 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 801/8010	EPA 824/8240	EPA 825/8270	TCLP Metals ☐ VOA ☐ VOA ☐	CAMP Metals EPA 801/807000 TLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA ☐ 7420/7421			Method of shipment	
			Soil	Water	Other	Ice	Acid																	
mw-9(16)	①	2		X				3/24/97	1152		X													Special detection Limit/reporting
mw-10(18)	②	2		X				3/24/97	1204		X													LOWEST POSSIBLE
																								Special QA/QC
																								AS NORMAL
																								Remarks
																								2080-5421.004
																								Lab number
																								59200547
																								Turnaround time
																								Priority Rush 1 Business Day

Condition of sample: ok				Temperature received: cool			
Relinquished by sampler		Date 3/24/97	Time 0700	Received by John Young		Date 3/26/97 Time 940	
Relinquished by		Date	Time	Received by			
Relinquished by		Date	Time	Received by laboratory CAS-3J		Date	Time

Lab number **59700547**

Turnaround time

Priority Rush 1 Business Day ☐

Rush 2 Business Days ☐

Expedited 5 Business Days ☐

Standard 10 Business Days ☒