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

Date June 18, 1996
Project 20805-127.003

To:

Mr. Dale Klettke
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502

We are enclosing:

Copies	Description
1	First quarter 1996 groundwater monitoring results for ARCO service station 2111, San Leandro, California
1	First Christian Church letter

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

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.

John C. Young
Project Manager

cc: Kevin Graves, RWQCB - SFBR
Mike Bakaldin, San Leandro Hazardous Materials Program
Michael Whelan, ARCO Products Company
File

ARCO Products Company

Date:

June 18, 1996

Re: ARCO Station #

2111 • 1156 Davis Street • San Leandro, CA
First Quarter 1996 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:

Michael R. Whelan

Michael R. Whelan
Environmental Engineer

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

June 3, 1996
Project 20805-127.003

Mr. Michael Whelan
ARCO Products Company
P.O. Box 612530
San Jose, California 95161

Re: First quarter 1996 groundwater monitoring program results, ARCO service station 2111, San Leandro, California

Dear Mr. Whelan:

This letter presents the results of the first quarter 1996 groundwater monitoring program at ARCO Products Company (ARCO) service station 2111, 1156 Davis Street , 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

REGISTERED GEOLOGIST
JOHN CHARLES YOUNG
Exp 7/96
NO. 6407
STATE OF CALIFORNIA

John C. Young, R.G. 6407
Project Manager

1:/ARCO\IMI01328.DOC-96 ljt:1

June 3, 1996

ARCO QUARTERLY REPORT

Station No.: 2111	Address: 1156 Davis Street, San Leandro, California
EMCON Project No.	20805-127.003
ARCO Environmental Engineer/Phone No.:	Michael Whelan /(408) 453-1640
EMCON Project Manager/Phone No.:	John C. Young /(408) 453-7300
Primary Agency/Regulatory ID No.:	ACHCSA /Dale Klettke Case No. STID 744

WORK PERFORMED THIS QUARTER (First- 1996):

1. Prepared and submitted quarterly monitoring report for fourth quarter 1995.
2. Conducted quarterly groundwater monitoring and sampling for first quarter 1996.
3. Installed on-site vapor extraction wells V-1 through V-4, on-site groundwater monitoring well MW-7, and off-site groundwater monitoring wells MW-5 and MW-6.

WORK PROPOSED FOR NEXT QUARTER (Second- 1996):

1. Perform quarterly groundwater monitoring and sampling for second quarter 1996.
2. Submit quarterly report for first quarter 1996.
3. Submit report of findings for soil and groundwater investigation to ARCO.

QUARTERLY MONITORING:

Current Phase of Project:	Quarterly Groundwater Monitoring and Soil and Groundwater Assessment
Frequency of Sampling:	Quarterly (groundwater)
Frequency of Monitoring:	Quarterly (groundwater)
Is Floating Product (FP) Present On-site:	☐ Yes ☒ No
Bulk Soil Removed to Date :	Unknown
Bulk Soil Removed This Quarter :	None
Water Wells or Surface Waters, within 2000 ft., impacted by site:	None
Current Remediation Techniques:	None
Approximate Depth to Groundwater:	12.6 feet
Groundwater Gradient (Average):	0.005 ft/ft toward west-southwest (consistent with past events)

ATTACHED:

- Table 1 - Groundwater Monitoring Data, First Quarter 1996
- Table 2 - Historical Groundwater Elevation Data
- Table 3 - Historical Groundwater Analytical Data, Petroleum Hydrocarbons and Their Constituents
- Figure 1 - Site Location
- Figure 2 - Site Plan
- Figure 3 - Groundwater Data, First Quarter 1996
- Appendix A - Field Data Sheets, First Quarter 1996 Groundwater Monitoring Event
- Appendix B - Analytical Results and Chain of Custody Documentation, First Quarter 1996 Groundwater Monitoring Event

cc: Dale Klettke, ACHCSA
Kevin Graves, RWQCB-SFBR
Mike Bakaldin, San Leandro Hazardous Materials Program

Table 1
Groundwater Monitoring Data
First Quarter 1996

ARCO Service Station 2111
1156 Davis Street, San Leandro, California

Date: 05-14-96

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	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
MW-1	03-21-96	39.60	14.72	24.88	ND	WSW	0.005	03-21-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-2	03-21-96	37.99	12.84	25.15	ND	WSW	0.005	03-21-96	9600	850	30	280	1400	250	--	--
MW-3	03-21-96	39.32	14.17	25.15	ND	WSW	0.005	03-21-96	<50	<0.5	<0.5	<0.5	<0.5	<3	<500	<50
MW-4	03-21-96	38.10	12.74	25.36	ND	WSW	0.005	03-21-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-5	03-21-96	37.21	12.60	24.61	ND	WSW	0.005	03-22-96	<50	<0.5	<0.5	<0.5	<0.5	82	--	--
MW-6	03-21-96	37.11	11.55	25.56	ND	WSW	0.005	03-22-96	<50	<0.5	1.9	<0.5	<0.5	<3	--	--
MW-7	03-21-96	38.68	13.32	25.36	ND	WSW	0.005	03-22-96	32000	870	450	970	4900	280	--	--

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 Statest 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
-- : not available, not analyzed

esj/h:\2111\2111mdb.xls\Table 1:imi
20805-127.003

Table 2
Historical Groundwater Elevation Data

ARCO Service Station 2111
1156 Davis Street, San Leandro, California

Date: 05-17-96

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 foot/foot
MW-1	08-01-95	39.60	17.45	22.15	ND	NR	NR
MW-1	12-14-95	39.60	17.09	22.51	ND	W	0.002
MW-1	03-21-96	39.60	14.72	24.88	ND	WSW	0.005
MW-2	08-01-95	37.99	15.67	22.32	ND	NR	NR
MW-2	12-14-95	37.99	15.36	22.63	ND	W	0.002
MW-2	03-21-96	37.99	12.84	25.15	ND	WSW	0.005
MW-3	08-01-95	39.32	17.00	22.32	ND	NR	NR
MW-3	12-14-95	39.32	16.70	22.62	ND	W	0.002
MW-3	03-21-96	39.32	14.17	25.15	ND	WSW	0.005
MW-4	08-01-95	38.10	15.65	22.45	ND	NR	NR
MW-4	12-14-95	38.10	15.35	22.75	ND	W	0.002
MW-4	03-21-96	38.10	12.74	25.36	ND	WSW	0.005
MW-5	03-21-96	37.21	12.60	24.61	ND	WSW	0.005
MW-6	03-21-96	37.11	11.55	25.56	ND	WSW	0.005
MW-7	03-21-96	38.68	13.32	25.36	ND	WSW	0.005

ft-MSL: elevation in feet, relative to mean sea level
MWN: ground-water flow direction and gradient apply to the entire monitoring well network
NR: not reported; data not available or not measurable
ND: none detected
- -: not available

Table 3
Historical Groundwater Analytical Data
Petroleum Hydrocarbons and Their Constituents

ARCO Service Station 2111
1156 Davis Street, San Leandro, California

Date: 05-17-96

Well Designation	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	TRPH EPA 418.1 µg/L	TPHD LUFT Method µg/L
MW-1	08-01-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
MW-1	12-14-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-1	03-21-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-2	08-01-95	23000	1300	310	500	3500	--	--	--
MW-2	12-14-95	7300	900	25	180	1000	<200*	--	--
MW-2	03-21-96	9600	850	30	280	1400	250	--	--
MW-3	08-01-95	<50	<0.5	<0.5	<0.5	<0.5	--	600	76^
MW-3	12-14-95	<50	<0.5	<0.5	<0.5	<0.5	<3	<500	<50
MW-3	03-21-96	<50	<0.5	<0.5	<0.5	<0.5	<3	<500	<50
MW-4	08-01-95	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
MW-4	12-14-95	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-4	03-21-96	<50	<0.5	<0.5	<0.5	<0.5	<3	--	--
MW-5	03-22-96	<50	<0.5	<0.5	<0.5	<0.5	82	--	--
MW-6	03-22-96	<50	<0.5	1.9	<0.5	<0.5	<3	--	--
MW-7	03-22-96	32000	870	450	970	4900	280	--	--

TPHG: total petroleum hydrocarbons as gasoline, California DHS LUFT Method
µg/L: micrograms per liter
EPA: United Statest Environmental Protection Agency
MTBE: Methyl-tert-butyl ether
TRPH: total recoverable petroleum hydrocarbons
TPHD: total petroleum hydrocarbons as diesel, California DHS LUFT Method
- - : not analyzed
^: chromatogram fingerprint is not characteristic of diesel
*: method reporting limit was raised due to: (1) high analyte concentration requiring sample dilution, or (2) matrix interference

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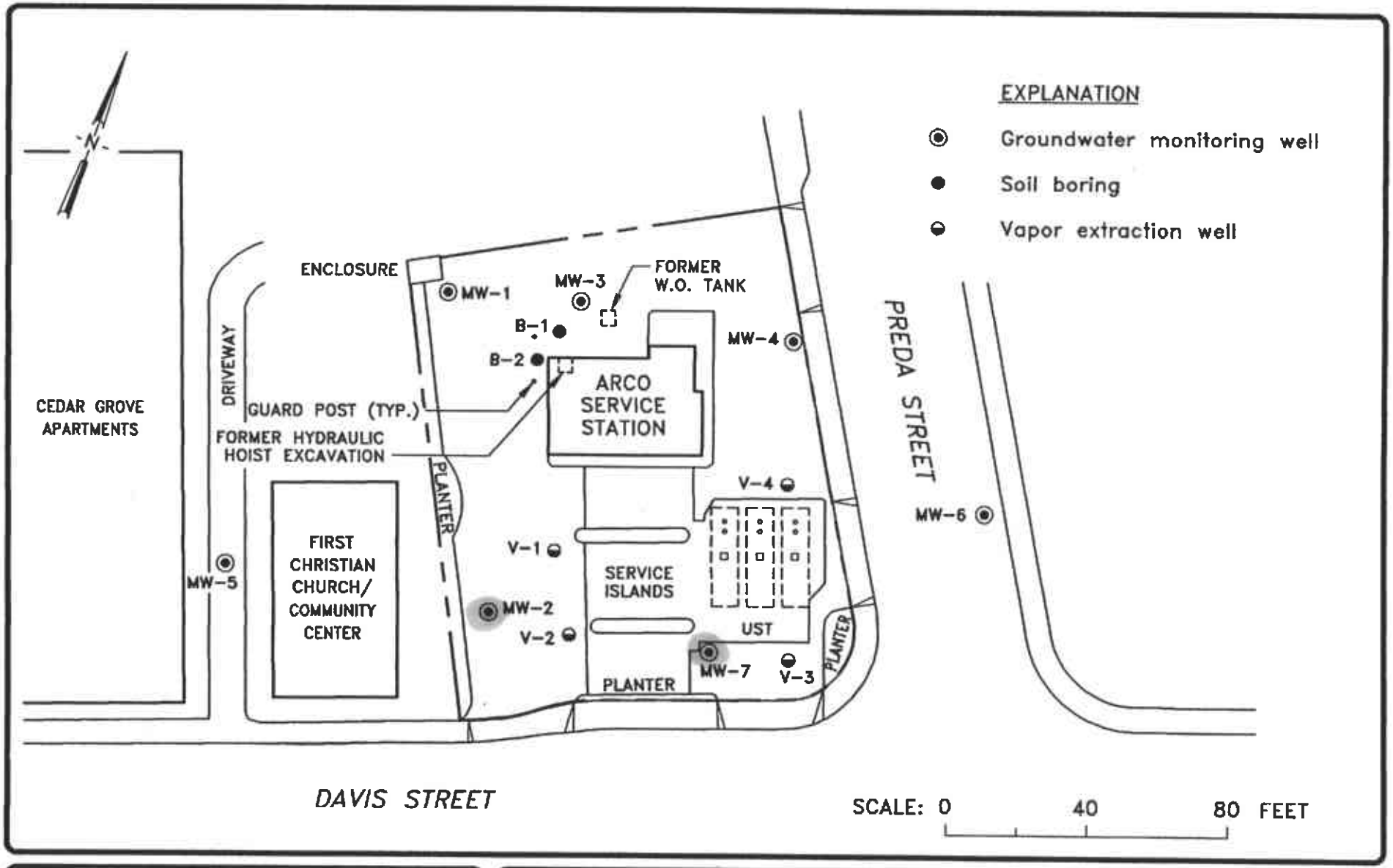
EMCON

ARCO PRODUCTS COMPANY
SERVICE STATION 2111, 1156 DAVIS STREET
QUARTERLY GROUNDWATER MONITORING
SAN LEANDRO, CALIFORNIA

SITE LOCATION

FIGURE
1
PROJECT NO.
805-127.03



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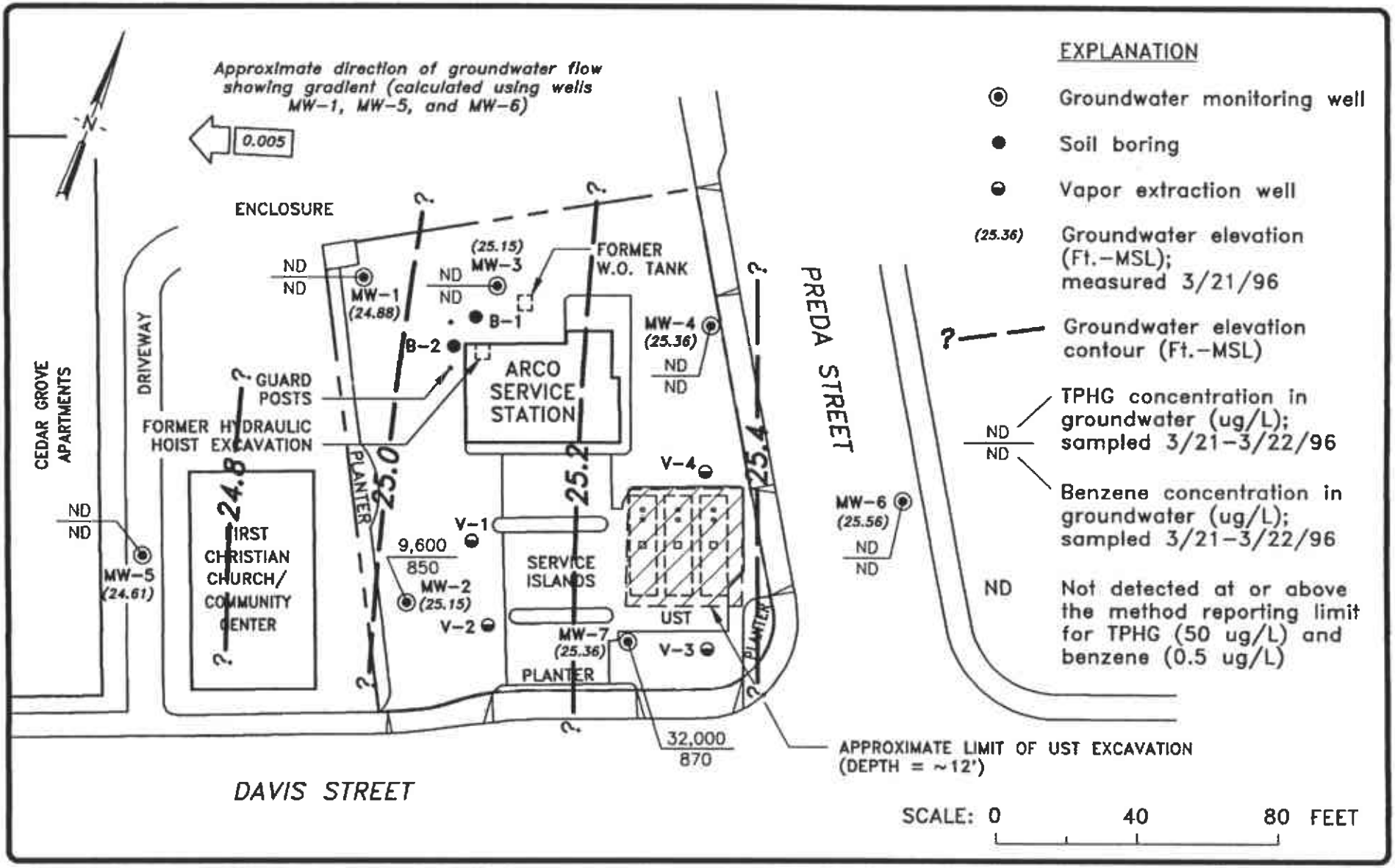
ARCO PRODUCTS COMPANY
SERVICE STATION 2111, 1156 DAVIS STREET
QUARTERLY GROUNDWATER MONITORING
SAN LEANDRO, CALIFORNIA

SITE PLAN

FIGURE
2
PROJECT NO.
805-127.03



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ARCO PRODUCTS COMPANY
SERVICE STATION 2111, 1156 DAVIS STREET
SOIL AND GROUNDWATER ASSESSMENT
SAN LEANDRO, CALIFORNIA

GROUNDWATER DATA
FIRST QUARTER 1996

FIGURE
3
PROJECT NO.
805-127.003

APPENDIX A

FIELD DATA SHEETS, FIRST QUARTER 1996 GROUNDWATER MONITORING EVENT

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 21775-226.002 STATION ADDRESS : 1156 Davis Street, San Leandro DATE : 3/21/96

ARCO STATION # : 2111 FIELD TECHNICIAN : Jon Williams DAY : Thursday

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	MW-1	ok	yes	None	3490	ok	14.72	14.72	ND	ND	26.2	
2	MW-4	ok	yes	None	3490	ok	12.74	12.74	ND	ND	21.7	Need new lock
3	MW-3	ok	yes	None	3490	ok	14.17	14.17	ND	ND	26.7	
4	MW-2	ok	yes	None	3490	ok	12.84	12.84	ND	ND	26.7	
5	MW-5	ok	yes	ok	Dolphin	ok	12.60	12.60	ND	ND	23.9	**Please replace lock w/ 3490**
6	MW-6	Bad	~~yes~~	ok	Dolphin	ok	11.55	11.55	ND	ND	25.2	**Please replace lock w/ 3490**
7	MW-7	ok	ok	None	Dolphin	Bad	13.32	13.32	ND	ND	27.2	**Please replace lock w/ 3490** Need new cap

SURVEY POINTS ARE TOP OF WELL CASINGS

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 20805-127.002 STATION ADDRESS : 1156 Davis Street, San Leandro DATE : 3/21/96

ARCO STATION # : 2111 FIELD TECHNICIAN : Joe Williams DAY : Thursday

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	V-1	ok	yes	None	None	ok	10.55	10.55	ND	ND	19.70	
2	V-2	ok	yes	None	None	ok	13.02	13.02	ND	ND	19.70	
3	V-3	ok	yes	None	None	ok	12.46	12.46	ND	ND	19.50	
4	V-4	ok	yes	None	None	ok	13.00	13.00	ND	ND	18.30	

SURVEY POINTS ARE TOP OF WELL CASINGS

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON

PROJECT NO: 21775-226.002 SAMPLE ID: MW-1 (26)

PURGED BY: Joe Williams CLIENT NAME: ARCO 2111

SAMPLED BY: Joe Williams LOCATION: San Leandro

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

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

CASING ELEVATION (feet/MSL): N/A VOLUME IN CASING (gal.): 7.50

DEPTH TO WATER (feet): 14.72 CALCULATED PURGE (gal.): 22.50

DEPTH OF WELL (feet): 26.2 ACTUAL PURGE VOL. (gal.): 240

DATE PURGED: 03-21-96 Start (2400 Hr) 1300 End (2400 Hr) 1309

DATE SAMPLED: " Start (2400 Hr) 1315 End (2400 Hr) [redacted]

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1305	8.0	6.32	713	71.7	brown	heavy
1307	16.0	6.46	707	70.8	brown	moderate
1309	24.0	6.50	706	70.7	brown	moderate

D. O. (ppm): N/A ODOR: NONE N/A (COBALT 0 - 500) N/A (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: N/A

Parameters field filtered at this well: N/A

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 #: 3490

REMARKS: ___

Meter Calibration: Date: 3/21/96 Time: 1240 Meter Serial #: 9208 Temperature °F: 71.2

(EC 1000 1049/1000) (DI ___) (pH 7 7.04/7.00) (pH 10 10.02/10.00) (pH 4 3.97/___)

Location of previous calibration: ___

Signature: [signature] Reviewed By: SA Page 1 of 7

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON

PROJECT NO: 21775-226.002 SAMPLE ID: MW-2 (26)

PURGED BY: Joe Williams CLIENT NAME: ARCO 2111

SAMPLED BY: Joe Williams LOCATION: San Leandro

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.):	9.25
DEPTH TO WATER (feet):	12.84	CALCULATED PURGE (gal.):	27.16
DEPTH OF WELL (feet):	26.7	ACTUAL PURGE VOL. (gal.):	28.0

DATE PURGED: 3/21/96 Start (2400 Hr) 14 45 End (2400 Hr) 14:48

DATE SAMPLED: ↓ Start (2400 Hr) 14:55 End (2400 Hr) ___

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
14 46	~~9~~ 9.5	6.59	707	66.2	Brown	Heavy
14:47	19.0	~~6~~ 6.48	714	67.2	Brown	Mod.
14:48	28.0	6.52	716	67.3	Brown	Mod.

D. O. (ppm): NR ODOR: ~~Non~~ Slight

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	✓ Bailer (Teflon®)
✓ Centrifugal Pump	___ 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: OK LOCK #: 3490

REMARKS: ___

Meter Calibration: Date: 3/21/96 Time: 12:40 Meter Serial #: 9201 Temperature °F: 71.2

(EC 1000 1049 / 1002) (DI ___) (pH 7 7.04 / 7.00) (pH 10 10.02 / 10.00) (pH 4 3.97 / ___)

Location of previous calibration: ___

Signature: ___ Reviewed By: Gil Page 2 of 7

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON

PROJECT NO: 21775-226.002 SAMPLE ID: MW-3 (26)

PURGED BY: Joe Williams CLIENT NAME: ARCO 2111

SAMPLED BY: Joe Williams LOCATION: San Lorenzo

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.): 8.18

DEPTH TO WATER (feet): 14.17 CALCULATED PURGE (gal.): 24.54

DEPTH OF WELL (feet): 26.7 ACTUAL PURGE VOL. (gal.): 25.5

DATE PURGED: 3/21/96 Start (2400 Hr) 1400 End (2400 Hr) 14.07

DATE SAMPLED: ↓ Start (2400 Hr) 1420 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1402	8.5	6.49	727	66.8	Brown	Mod.
14.04	17.0	6.59	7.31	67.0	Light	Trace
14:07	25.5	6.59	733	66.9	Clear	Trace

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	✓ Bailer (Teflon®)
✓ Centrifugal Pump	— 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: ok LOCK #: 3490

REMARKS: ___

Meter Calibration: Date: 3/21/96 Time: 12:40 Meter Serial #: 9208 Temperature °F: 71.2

(EC 1000 1049 / 1001) (DI ___) (pH 7 7.04 / 7.00) (pH 10 10.02 10.00) (pH 4 3.97 / ___)

Location of previous calibration: ___

Signature: [signature] Reviewed By: [signature] Page 3 of 7

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON

PROJECT NO: 21775.-226 002 SAMPLE ID: MW-4 (2L)

PURGED BY: Joe Williams CLIENT NAME: ARCO 2111

SAMPLED BY: Joe Williams LOCATION: San Leandro

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.): 5.85

DEPTH TO WATER (feet): 12.74 CALCULATED PURGE (gal.): 17.56

DEPTH OF WELL (feet): 21.7 ACTUAL PURGE VOL. (gal.): 19 C

DATE PURGED: 3/21/96 Start (2400 Hr) 13.31 End (2400 Hr) 13.39

DATE SAMPLED: ↓ Start (2400 Hr) 13.46 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1335	6.0	6.60	780	72.4	Brown	Heavy
1337	12.0	6.60	768	70.2	Brown	Heavy
1339	18.0	6.63	757	69.5	Brown	Heavy

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

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

TURBIDITY (visual): ~~NR~~ 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®)
- ___ 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 #: 3490

REMARKS: ___

Meter Calibration: Date: 3/21/96 Time: 12:40 Meter Serial #: 9208 Temperature °F: 71.2

(EC 1000 1049 / 1000) (DI ___) (pH 7 7.04 / 7.00) (pH 10 10.02 / 1000) (pH 4 3.97 / —)

Location of previous calibration: ___

Signature: [signature] Reviewed By: SC Page 4 of 7

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 2905-177.CC1 SAMPLE ID: MW-5 (79)

PURGED BY: J. Williams CLIENT NAME: ARCC #3111

SAMPLED BY: J. Williams LOCATION: San Leandro, 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): NA VOLUME IN CASING (gal.): 1.84

DEPTH TO WATER (feet): 12.60 CALCULATED PURGE (gal.): 5.53

DEPTH OF WELL (feet): 23.9 ACTUAL PURGE VOL. (gal.): 6.0

DATE PURGED: 3/27/96 Start (2400 Hr) 1206 End (2400 Hr) 1209

DATE SAMPLED: " Start (2400 Hr) 1715 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1207	2.0	6.76	894	67.5	BRN	Heavy
1208	4.0	6.77	909	67.1	"	"
1209	6.0	6.77	906	67.2	"	"

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

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

Other: ___

SAMPLING EQUIPMENT

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

Other: ___

WELL INTEGRITY: Good LOCK #: ___

REMARKS: RECD LOCK

Meter Calibration: Date: 3/27/96 Time: ___ Meter Serial #: 9708 Temperature °F: ___

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

Location of previous calibration: MW-6

Signature: [signature] Reviewed By: SH Page 2 of 10

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON

PROJECT NO: 20805-122.001 SAMPLE ID: MW-6 (75)

PURGED BY: J. Williams CLIENT NAME: ARCO 7111

SAMPLED BY: ↓ LOCATION: SAN LEANDRO

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

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

CASING ELEVATION (feet/MSL): NR VOLUME IN CASING (gal.): 2.22

DEPTH TO WATER (feet): 11.55 CALCULATED PURGE (gal.): 6.66

DEPTH OF WELL (feet): 25.2 ACTUAL PURGE VOL. (gal.): 7

DATE PURGED: 03-22-96 Start (2400 Hr) 1020 End (2400 Hr) 1024

DATE SAMPLED: ↓ Start (2400 Hr) 1027 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1021	2.5	6.37	910	68.0	BRN	Heavy
1027	5.0	6.46	959	67.9	↓	↓
1024	7.0	6.51	951	65.3	↓	↓

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	✓ Bailer (Teflon®)
✓ Centrifugal Pump	___ 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: Rad SEAL LOCK #: 3490

REMARKS: All samples taken

Meter Calibration: Date: 3-22-96 Time: 1020 Meter Serial #: 9208 Temperature °F: 72.3

(EC 1000 999 / 1002) (DI ___) (pH 7 7.02 / 7.00) (pH 10 10.07 / 10.00) (pH 4 3.99 / —)

Location of previous calibration: ___

Signature: [signature] Reviewed By: GA Page 4 of 10

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON

PROJECT NO: 70905-127.001 SAMPLE ID: MW-7(27')

PURGED BY: T. Williams CLIENT NAME: ARCO #2111

SAMPLED BY: ↓ LOCATION: San Leandro, 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.): 9.0

DEPTH TO WATER (feet): 13.32 CALCULATED PURGE (gal.): 27.26

DEPTH OF WELL (feet): 27.2 ACTUAL PURGE VOL. (gal.): 12.0

DATE PURGED: 3-22-96 Start (2400 Hr) 1042 End (2400 Hr) 1045

DATE SAMPLED: ↓ Start (2400 Hr) 1049 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
~~1044~~ 1044	9.0	6.80	1108	69.5	BRN	Heavy
	~~Well~~ well	dried	at 12.0 gallons			
	~~Recharge~~					
~~1050~~	recharge	6.92	1150	69.7	↓	↓

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

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

TURBIDITY (visual): L/R (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
- X Centrifugal Pump
- ___ Submersible Pump
- ___ Well Wizard™
- ___ Bailer (Teflon®)
- ___ Bailer (PVC)
- ___ Bailer (Stainless Steel)
- ___ Dedicated

Other: ___

SAMPLING EQUIPMENT

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

Other: ___

WELL INTEGRITY: Good LOCK #: ~~Arco~~ 3259

REMARKS: GW Sampler Teflon

Meter Calibration: Date: 3/22/96 Time: ___ Meter Serial #: 6208 Temperature °F: ___

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

Location of previous calibration: MW-6

Signature: [signature] Reviewed By: [signature] Page 7 of 7

APPENDIX B

ANALYTICAL RESULTS AND CHAIN OF CUSTODY DOCUMENTATION, FIRST QUARTER 1996 GROUNDWATER MONITORING EVENT

Columbia Analytical Services inc.

April 5, 1996

Service Request No: S9600479

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

Re: 2111 San Leandro/Project No. 20805-127.002/TO#19350.00

Dear Mr. Young:

The following pages contain analytical results for sample(s) received by the laboratory on March 22, 1996. 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 12, 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

SLG/jk

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)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	L9601907
Project:	ARCO Products Company #2111/#20805-127.002/#19350.00	**Date Collected:**	3/21/96
Sample Matrix:	Water	**Date Received:**	3/22/96
		Date Extracted:	4/2/96
		Date Analyzed:	4/2/96

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

Sample Name	Lab Code	MRL	Result
MW-3 (26)	L9601907-001	0.5	ND
Method Blank	L9601907-MB	0.5	ND

1AMRL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9600479
Project:	ARCO Products Company #2111/#20805-127.002/#19350.00	**Date Collected:**	3/21,22/96
Sample Matrix:	Water	**Date Received:**	3/22/96
		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(26)**	**MW-4(21)**	**MW-3(26)**
	Lab Code:	S9600479-001	S9600479-002	S9600479-003
	Date Analyzed:	3/29-4/1/96	3/29-4/1/96	3/29-4/1/96
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-tert-butyl ether	3	ND	ND	ND

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9600479
Project:	ARCO Products Company #2111/#20805-127.002/#19350.00	**Date Collected:**	3/21,22/96
Sample Matrix:	Water	**Date Received:**	3/22/96
		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(26)**	**MW-6(25)**	**MW-7(27)**
	Lab Code:	S9600479-004	S9600479-005	S9600479-006
	Date Analyzed:	3/29-4/1/96	3/29-4/1/96	3/29-4/1/96
Analyte	**MRL**			
TPH as Gasoline	50	9600	ND	32000
Benzene	0.5	850	ND	870
Toluene	0.5	30	1.9	450
Ethylbenzene	0.5	280	ND	970
Total Xylenes	0.5	1400	ND	4900
Methyl-tert-butyl ether	3	250	ND	280

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S9600479
Project:	ARCO Products Company #2111/#20805-127.002/#19350.00	**Date Collected:**	3/21,22/96
Sample Matrix:	Water	**Date Received:**	3/22/96
		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**	**Method Blank**
	Lab Code:	S960329-WB	S960401-WB
	Date Analyzed:	3/29-4/1/96	3/29-4/1/96
Analyte	**MRL**		
TPH as Gasoline	50	ND	ND
Benzene	0.5	ND	ND
Toluene	0.5	ND	ND
Ethylbenzene	0.5	ND	ND
Total Xylenes	0.5	ND	ND
Methyl-tert-butyl ether	3	ND	ND

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	L9601907
Project:	ARCO Products Company #2111/#20805-127.002/#19350.00	**Date Collected:**	3/21/96
Sample Matrix:	Water	**Date Received:**	3/22/96
		Date Extracted:	3/29/96

Total Petroleum Hydrocarbons as Diesel
EPA Methods 3510/Modified 8015/California DHS LUFT Method
Units: ug/L (ppb)

Sample Name	Lab Code	Date Analyzed	MRL	Result
MW-3 (26)	L9601907-001	3/29/96	50	ND
Method Blank	L9601907-MB	3/29/96	50	ND

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S9600479
Project:	ARCO Products Company #2111/#20805-127.002/#19350.00	**Date Collected:**	3/21/96
Sample Matrix:	Water	**Date Received:**	3/22/96
		Date Extracted:	NA
		Date Analyzed:	3/29-4/1/96

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

Sample Name	Lab Code	PID Detector Percent Recovery 4-Bromofluorobenzene	FID Detector Percent Recovery α,α,α–Trifluorotoluene
MW-1(26)	S9600479-001	92	108
MW-4(21)	S9600479-002	91	103
MW-3(26)	S9600479-003	92	106
MW-2(26)	S9600479-004	95	106
MW-6(25)	S9600479-005	93	103
MW-7(27)	S9600479-006	89	111
Method Blank	S960329-WB	89	102
Method Blank	S960401-WB	92	108
	CAS Acceptance Limits:	69-116	69-116

SUR2/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S9600479
Project:	ARCO Products Company #2111/#20805-127.002/#1935	**Date Collected:**	3/21/96
Sample Matrix:	Water	**Date Received:**	3/22/96
		Date Extracted:	NA
		Date Analyzed:	3/29-4/1/96

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

Sample Name: Batch QC
Lab Code: S9600497-005DMS

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Gasoline	250	250	ND	260	270	104	108	67-121	4

DMS1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Products Company #2111/#20805-127.002/#19350.00

Service Request: S9600479
Date Analyzed: 3/29-4/1/96

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	23.7	95	85-115
Toluene	25	23.6	94	85-115
Ethylbenzene	25	23.0	92	85-115
Xylenes, Total	75	70.9	95	85-115
Methyl tert-Butyl Ether	50	44	88	85-115
Gasoline	250	257	103	90-110

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	L9601907
Project:	ARCO Products Company #2111/#20805-127.002/#19350.00	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	NA

Surrogate Recovery Summary
Total Petroleum Hydrocarbons as Diesel
EPA Methods 3510/Modified 8015/California DHS LUFT Method

Sample Name	**Lab Code**	**Percent Recovery** *p*-Terphenyl
MW-3 (26)	L9601907-001	79
Method Blank	L9601907-MB	100
Laboratory Control Sample	L9601907-LCS	78
Duplicate Laboratory Control Sample	L9601907-DLCS	69

CAS Acceptance Limits: 50-140

SUR1/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	L9601907
Project:	ARCO Products Company #2111/#20805-127.002/#19350.00	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	4/2/96
		Date Analyzed:	4/2/96

Laboratory Control Sample/Duplicate Laboratory Control Sample Summary*
Total Recoverable Petroleum Hydrocarbons (TRPH)
EPA Method 418.1
Units: mg/L (ppm)

	True Value		Result		Percent Recovery			
Analyte	LCS	DLCS	LCS	DLCS	LCS	DLCS	CAS Acceptance Limits	**Relative Percent Difference**
TRPH	1.91	1.91	1.75	1.64	92	86	75-125	6

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

DLCS/032395

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	L9601907
Project:	ARCO Products Company #2111/#20805-127.002/#19350.00	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	3/29/96
		Date Analyzed:	3/29/96

Laboratory Control Sample/Duplicate Laboratory Control Sample Summary*
Total Petroleum Hydrocarbons as Diesel
EPA Methods 3510/Modified 8015/California DHS LUFT Method
Units: ug/L (ppb)

	True Value		Result		Percent Recovery			
Analyte	LCS	DLCS	LCS	DLCS	LCS	DLCS	CAS Acceptance Limits	**Relative Percent Difference**
Diesel	2000	2000	1870	1830	94	92	70-140	3

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

DLCS/032395

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 19350.00

Chain of Custody

ARCO Facility no. 2111	City (Facility) San Leandro	Project manager (Consultant) John Young	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) (408)453-7300	Fax no. (Consultant) (408)453-0452
Consultant name EMCON	Address (Consultant) 1921 Ringwood Ave, San Jose, CA 95131		Contract number

Method of shipment: Sampler will deliver

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) and/or 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(26)	1	2		X		X	HCL	3-21-96	1315		X											
MW-4(21)	2	2		X		X	HCL	↓	1346		X											
MW-3(26)	3	6		X		X	HCL		1420		X	X		X								
MW-7(26)	4	2		X		X	HCL		1455		X											
MW-5( )		2		X		X	HCL				X											
MW-6(25)	5	2		X		X	HCL	3-22-96	1027		X											
MW-7(27)	6	2		X		X	HCL	↓	1049		X											

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks #20805-127.0
2-40ml HCL VOAs (All Wells)
2-1liter HCL Glass
2-1liter NP Glass (MW-3)

Lab number: 59600479

Turnaround time
- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days 4/5 ☒

Condition of sample:		Temperature received:	
Relinquished by sampler	Date 3-22-96 Time 1320	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory	Date 3-22-96 Time 1320

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

R8/S3

Subcontract Lab: LLAB

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 19350.00

Chain of Custody

ARCO Facility no. 2111	City (Facility) San Leandro	Project manager (Consultant) John Young	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no. (Consultant)	Fax no. (Consultant)
Consultant name EMCON	Address (Consultant) San Jose		Contract number
			Method of shipment

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 ☐ (NP)	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E (HCl)	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 ☐		
(26) MW-3		4		X		X	X	3/21/96	1420			X		X								

Special detection Limit/reporting
TPH-D: 50 ppb
Lowest possible

Special QA/QC
ARCO

Remarks
#20805-127.002

L9601907

Lab number
9600479

Turnaround time
- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days 4/5 ☒

Condition of sample: intact

Temperature received: cold

	Date	Time		Date	Time
Relinquished by sampler			Received by		
Relinquished by			Received by		
Relinquished by SLAB Jamie Brown	9-25-96	1700	Received by laboratory Catherine Hampton	3/26/96	930am

/ILSR/Draft Invoice #2 final

LLAB: TPH-D, 418.1

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

Columbia Analytical Services inc.

April 5, 1996 Service Request No: S9600480

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

Re: 2111 San Leandro/Project No. 20805-127.002/TO#19350.00

Dear Mr. Young:

The following pages contain analytical results for sample(s) received by the laboratory on March 22, 1996. 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

SLG/jk

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)

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	ARCO Products Company	**Service Request:**	S9600480
Project:	2111 San Leandro/Project No. 20805-127.002/TO#19350.00	**Date Collected:**	3/22/96
Sample Matrix:	Water	**Date Received:**	3/22/96
		Date Extracted:	NA

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

		Sample Name:	**MW-5(25)**	**Method Blank**
		Lab Code:	S9600480-001	S960401-WB
		Date Analyzed:	4/1/96	4/1/96
Analyte	**MRL**			
TPH as Gasoline	50		ND	ND
Benzene	0.5		ND	ND
Toluene	0.5		ND	ND
Ethylbenzene	0.5		ND	ND
Total Xylenes	0.5		ND	ND
Methyl *tert*-Butyl Ether	3		82	ND

3S22/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9600480
Project:	2111 San Leandro/Project No. 20805-127.002/TO#19350.00	**Date Collected:**	3/22/96
Sample Matrix:	Water	**Date Received:**	3/22/96
		Date Extracted:	NA
		Date Analyzed:	4/1/96

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

Sample Name	Lab Code	PID Detector Percent Recovery 4-Bromofluorobenzene	FID Detector Percent Recovery α,α,α–Trifluorotoluene
MW-5(25)	S9600480-001	94	101
Method Blank	S960401-WB	92	108
CAS Acceptance Limits:		69-116	69-116

SUR2/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9600480
Project:	2111 San Leandro/Project No. 20805-127.002/TO#19350.00	**Date Collected:**	3/11/96
Sample Matrix:	Water	**Date Received:**	3/22/96
		Date Extracted:	NA
		Date Analyzed:	4/1/96

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

Sample Name: MW-5(25)
Lab Code: S9600480-001DMS

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Gasoline	250	250	ND	250	250	100	100	67-121	<1

DMS1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	ARCO Products Company	**Service Request:**	S9600480
Project:	2111 San Leandro/Project No. 20805-127.002/TO#19350.00	**Date Analyzed:**	4/1/96

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	24.5	98	85-115
Toluene	25	24.5	98	85-115
Ethylbenzene	25	24.0	96	85-115
Xylenes, Total	75	74.0	99	85-115
Gasoline	250	247	99	90-110
Methyl *tert*-Butyl Ether	50	46	92	85-115

ICV25AL/060194

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 19350.00

Chain of Custody

ARCO Facility no. 2111	City (Facility) San Leandro	Project manager (Consultant) John Young	Laboratory name CAS
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) (408)453-7300	Fax no. (Consultant) (408)453-0452
Consultant name EMCON	Address (Consultant) 1921 Ringwood Ave, San Jose, CA 95131		Contract number

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 (gas) EPA 8020/602/8015	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-5 (2nd)	1	2		X		X	HCL	3-22-96	1215		X											

Method of shipment: Sampler will deliver

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: 2 - 40ml HCL VOAs

#20805-127.0

Lab number: 596000480

Turnaround time

- Priority Rush 1 Business Day ☐
- Rush 2 Business Days ☐
- Expedited 5 Business Days ☐
- Standard 10 Business Days 4/5 ☒

Condition of sample:		Temperature received:	
Relinquished by sampler	Date 3-22-96 Time 1320	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory Joanie Brown	Date 3-22-96 Time 1320

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

R8/S3