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

Date September 29, 1995
Project 20805-131.003

To:

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

95 OCT -6 PM 2:45

We are enclosing:

Copies	Description
1	Second quarter 1995 groundwater monitoring report for ARCO service station 6002, Oakland, California

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

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.

David Larsen
Project Coordinator

cc: Kevin Graves, RWQCB - SFBR
Michael Whelan, ARCO Products Company
David Larsen, EMCON
File

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

Date: September 29, 1995

Re: ARCO Station # 6002 • 6235 Seminary Avenue • Oakland, CA
Second Quarter 1995 Groundwater Monitoring Report

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

Submitted by:

Michael R. Whelan

Michael R. Whelan
Environmental Engineer

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

August 24, 1995
Project 20805-131.003

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

Re: Second quarter 1995 groundwater monitoring program results, ARCO service station 6002, Oakland, California

Dear Mr. Whelan:

This letter presents the results of the second quarter 1995 groundwater monitoring program at ARCO Products Company (ARCO) service station 6002, 6235 Seminary Avenue, Oakland, California (Figure 1). The quarterly monitoring program complies with Alameda County Health Care Services Agency (ACHCSA) requirements regarding underground tank investigations.

BACKGROUND

Five on-site groundwater monitoring wells (MW-1 through MW-5) and two on-site vapor extraction wells (VW-1 and VW-2) were installed as part of a comprehensive site assessment conducted at this site between January and June 1994. Please refer to *Additional On-Site Subsurface Investigation and Second Quarter 1994 Groundwater Monitoring Report* (GeoStrategies, Inc., August 29, 1994), and *First Quarter 1995 Groundwater Monitoring Program Results, ARCO Service Station 6002, Oakland, California* (EMCON, May 1995) for more details.

MONITORING PROGRAM FIELD PROCEDURES AND RESULTS

A program of quarterly groundwater monitoring was initiated during the first quarter of 1994 to provide information concerning water quality, flow direction, and gradient consistent with ACHCSA and Regional Water Quality Control Board (RWQCB) requirements for underground fuel tank investigations. Wells MW-1 through MW-5 are monitored quarterly.

The second quarter 1995 groundwater monitoring event was performed by EMCON on May 30, 1995. Field work this quarter included (1) measuring depths to groundwater and subjectively analyzing groundwater for the presence of floating product in wells MW-1 through MW-5, (2) purging and subsequently sampling groundwater monitoring wells MW-1 through MW-5 for laboratory analysis, and (3) directing a state-certified laboratory to analyze the groundwater samples. Copies of all field data sheets from the second quarter 1995 groundwater monitoring event are included in Appendix A.

ANALYTICAL PROCEDURES

Groundwater samples collected during second quarter 1995 monitoring were analyzed for total petroleum hydrocarbons as gasoline (TPHG), and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Groundwater samples were prepared for analysis by U.S. Environmental Protection Agency (USEPA) method 5030 (purge and trap). Groundwater was analyzed for TPHG by the methods accepted by the Department of Toxic Substances Control, California Environmental Protection Agency (Cal-EPA), and referenced in the *Leaking Underground Fuel Tank* (LUFT) *Field Manual* (State Water Resources Control Board, October 1989). Samples were analyzed for BTEX by USEPA method 8020, as described in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods* (EPA SW-846, November 1986, third edition). These methods are recommended in the *Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites* (August 10, 1990) for analysis of samples from petroleum-hydrocarbon-impacted sites.

MONITORING PROGRAM RESULTS

Results of the second quarter 1995 groundwater monitoring event are summarized in Table 1 and illustrated in Figure 2. Historical groundwater elevation data, including top-of-casing elevations, depth-to-water measurements, calculated groundwater elevations, floating-product thickness measurements, and groundwater flow direction and gradient data, are summarized in Table 2. Table 3 summarizes historical laboratory data for TPHG and BTEX analyses. Copies of the second quarter 1995 analytical results and chain-of-custody documentation are included in Appendix B.

Groundwater elevation data collected on May 30, 1995, indicate that groundwater beneath the site flows west-southwest at an approximate hydraulic gradient of 0.08 foot per foot. Figure 2 illustrates groundwater contours and analytical data for the second quarter of 1995.

Groundwater samples from wells MW-2, MW-3, and MW-4 did not contain detectable concentrations of TPHG or BTEX. Groundwater samples from wells MW-1 and MW-5 contained 19,000 and 17,000 micrograms per liter (µg/L) TPHG, respectively, and 1,600 and 2,100 µg/L benzene, respectively.

LIMITATIONS

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

SITE STATUS UPDATE

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

Second Quarter 1995 Activities

- Prepared and submitted quarterly groundwater monitoring report for first quarter 1995.
- Performed quarterly groundwater monitoring for second quarter 1995.
- Obtained encroachment permit from Caltrans for installation of off-site groundwater monitoring well MW-6.
- Requested access to install off-site temporary monitoring points on two properties downgradient from ARCO service station 6002.
- Submitted utility investigation report to ACHCSA.

Work Anticipated for Third Quarter 1995

- Prepare and submit quarterly groundwater monitoring report for second quarter 1995.
- Perform quarterly groundwater monitoring for third quarter 1995.
- Install off-site groundwater monitoring well MW-6.
- Install on-site vapor extraction wells VW-3 and VW-4, and air-sparge well AS-1.
- Drill four soil borings adjacent to the pump islands.
- Continue pursuit of access to install off-site temporary monitoring points at two properties downgradient from ARCO service station 6002.

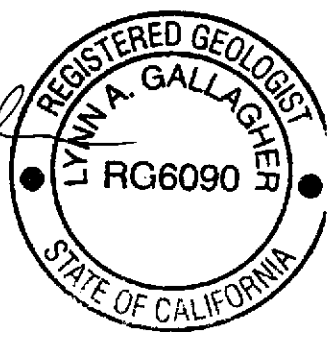
Please call if you have questions.

Sincerely,

EMCON

David Larsen
Project Coordinator

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



Attachments:
- Table 1 - Groundwater Monitoring Data, Second Quarter 1995
- Table 2 - Historical Groundwater Elevation Data
- Table 3 - Historical Groundwater Analytical Data (TPHG and BTEX)
- Figure 1 - Site Location
- Figure 2 - Groundwater Data, Second Quarter 1995
- Appendix A - Field Data Sheets, Second Quarter 1995 Groundwater Monitoring Event
- Appendix B - Analytical Results and Chain-of-Custody Documentation, Second Quarter 1995

cc: Juliet Shin, ACHCSA
Kevin Graves, RWQCB - SFBR

Table 1
Groundwater Monitoring Data
Second Quarter 1995

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, California

Date: 08-15-95
Project Number: 0805-131.03

Well Designation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot		µg/L	µg/L	µg/L	µg/L	µg/L
MW-1	05-30-95	247.06	8.48	238.58	ND	WSW	0.08	05-30-95	19000	1600	30	890	1400
MW-2	05-30-95	249.30	9.93	239.37	ND	WSW	0.08	05-30-95	<50	<0.5	<0.5	<0.5	<0.5
MW-3	05-30-95	248.35	7.81	240.54	ND	WSW	0.08	05-30-95	<50	<0.5	<0.5	<0.5	<0.5
MW-4	05-30-95	242.91	11.47	231.44	ND	WSW	0.08	05-30-95	<50	<0.5	<0.5	<0.5	<0.5
MW-5	05-30-95	244.82	12.97	231.85	ND	WSW	0.08	05-30-95	17000	2100	250	1000	520

TOC: top of casing
ft-MSL: elevation in feet, relative to mean sea level
MWN: groundwater flow direction and gradient apply to the entire monitoring well network
TPHG: total petroleum hydrocarbons as gasoline
µg/L: micrograms per liter
ND: none detected
WSW: west-southwest

esj/h:\6002\6002mdb.xls\Table 1:dcl
0805-131.03

Table 2
Historical Groundwater Elevation Data

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, California

Date: 08-15-95
Project Number: 0805-131.03

Well Designation	Water Level Field Date	TOC Elevation ft-MSL	Depth to Water feet	Ground-Water Elevation ft-MSL	Floating Product Thickness feet	Ground-Water Flow Direction MWN	Hydraulic Gradient foot/foot
MW-1	01-21-94	247.06	7.82	239.24	ND	NR	NR
MW-1	07-08-94	247.06	8.32	238.74	ND	W	0.08
MW-1	09-24-94	247.06	8.84	238.22	ND	WSW	0.08
MW-1	11-21-94	247.06	7.27	239.79	ND	SW	0.07
MW-1	03-15-95	247.06	7.37	239.69	ND	WSW	0.08
MW-1	05-30-95	247.06	8.48	238.58	ND	WSW	0.08
MW-2	07-08-94	249.30	9.51	239.79	ND	W	0.08
MW-2	09-24-94	249.30	10.02	239.28	ND	WSW	0.08
MW-2	11-21-94	249.30	7.83	241.47	ND	SW	0.07
MW-2	03-15-95	249.30	8.25	241.05	ND	WSW	0.08
MW-2	05-30-95	249.30	9.93	239.37	ND	WSW	0.08
MW-3	07-08-94	248.35	7.75	240.60	ND	W	0.08
MW-3	09-24-94	248.35	8.14	240.21	ND	WSW	0.08
MW-3	11-21-94	248.35	6.80	241.55	ND	SW	0.07
MW-3	03-15-95	248.35	6.76	241.59	ND	WSW	0.08
MW-3	05-30-95	248.35	7.81	240.54	ND	WSW	0.08
MW-4	07-08-94	242.91	10.97	231.94	ND	W	0.08
MW-4	09-24-94	242.91	11.81	231.10	ND	WSW	0.08
MW-4	11-21-94	242.91	9.14	233.77	ND	SW	0.07
MW-4	03-15-95	242.91	9.37	233.54	ND	WSW	0.08
MW-4	05-30-95	242.91	11.47	231.44	ND	WSW	0.08
MW-5	07-08-94	244.82	12.94	231.88	ND	W	0.08
MW-5	09-24-94	244.82	13.60	231.22	ND	WSW	0.08
MW-5	11-21-94	244.82	12.45	232.37	ND	SW	0.07
MW-5	03-15-95	244.82	11.99	232.83	ND	WSW	0.08
MW-5	05-30-95	244.82	12.97	231.85	ND	WSW	0.08

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

Table 3
Historical Groundwater Analytical Data

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, California

Date: 08-15-95
Project Number: 0805-131.03

Well Designation	Water Sample Field Date	TPHG µg/L	Benzene µg/L	Toluene µg/L	Ethylbenzene µg/L	Total Xylenes µg/L
MW-1	01-21-94	18000	1300	1600	250	1900
MW-1	07-08-94	21000	5200	<50	1000	1500
MW-1	09-24-94	13000	2900	37	830	640
MW-1	11-21-94	12000	2800	160	640	1300
MW-1	03-15-95	13000	1200	44	770	1100
MW-1	05-30-95	19000	1600	30	890	1400
MW-2	07-08-94	<50	<0.5	<0.5	<0.5	<0.5
MW-2	09-24-94	<50	<0.5	<0.5	<0.5	<0.5
MW-2	11-21-94	<50	<0.5	<0.5	<0.5	<0.5
MW-2	03-15-95	<50	<0.5	<0.5	<0.5	<0.5
MW-2	05-30-95	<50	<0.5	<0.5	<0.5	<0.5
MW-3	07-08-94	<50	<0.5	<0.5	<0.5	<0.5
MW-3	09-24-94	<50	<0.5	<0.5	<0.5	<0.5
MW-3	11-21-94	<50	<0.5	<0.5	<0.5	<0.5
MW-3	03-15-95	<50	<0.5	<0.5	<0.5	<0.5
MW-3	05-30-95	<50	<0.5	<0.5	<0.5	<0.5
MW-4	07-08-94	<50	<0.5	<0.5	<0.5	<0.5
MW-4	09-24-94	140	<0.5	<0.5	<0.9	<0.5
MW-4	11-21-94	<50	<0.5	<0.5	<0.5	<0.5
MW-4	03-15-95	<50	<0.5	<0.5	<0.5	<0.5
MW-4	05-30-95	<50	<0.5	<0.5	<0.5	<0.5
MW-5	07-08-94	41000	3300	<50	2200	2900
MW-5	09-24-94	28000	4000	<50	2400	2100
MW-5	11-21-94	38000	3100	<50	3100	4100
MW-5	03-15-95	21000	870	22	1600	1900
MW-5	05-30-95	17000	2100	250	1000	520

TPHG: total petroleum hydrocarbons as gasoline
µg/L: micrograms per liter

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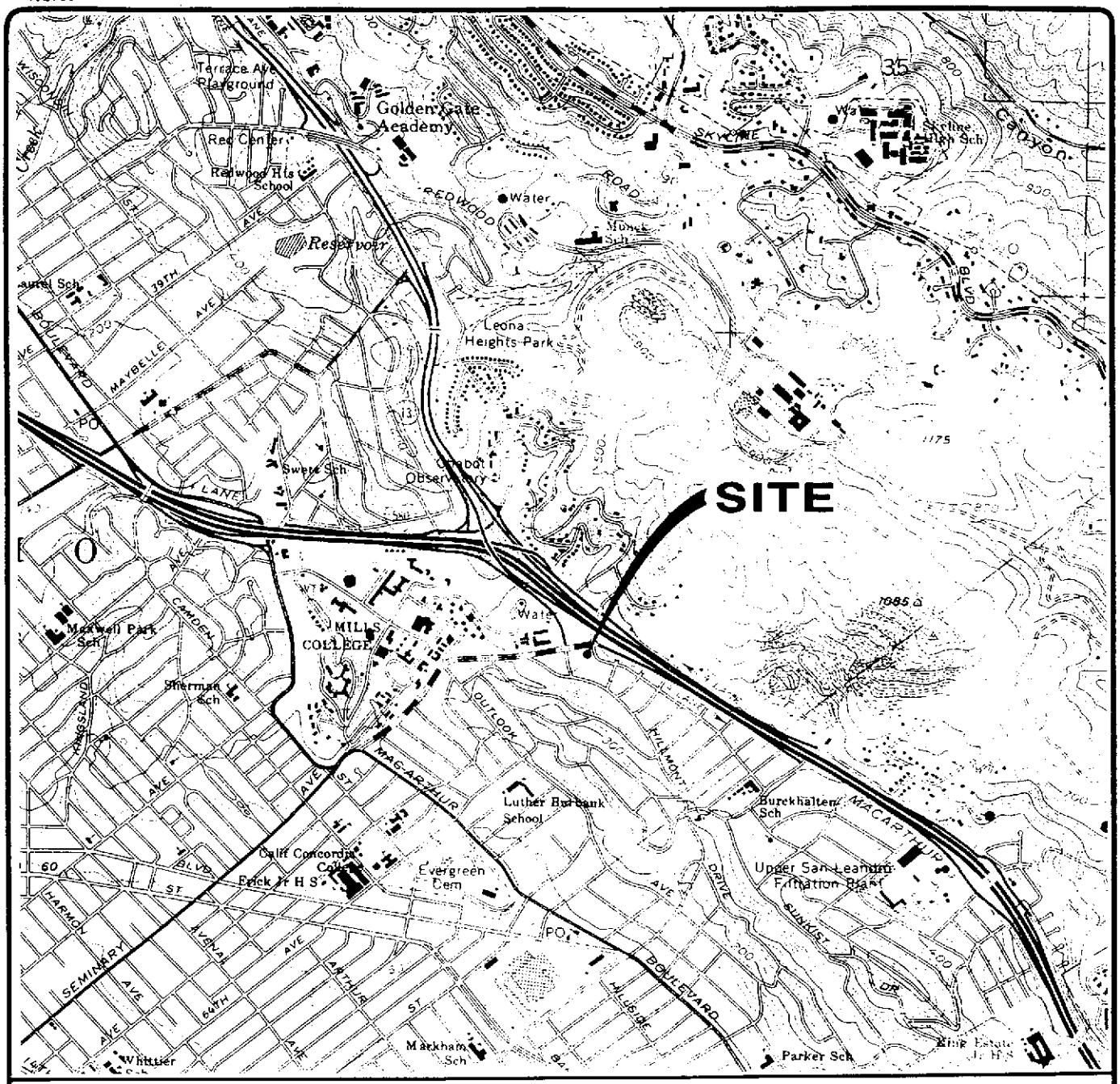

Base map from USGS 7.5' Quad. Map:
Oakland East, California.
Photorevised 1980.

Scale : 0 2000 4000 Feet

N

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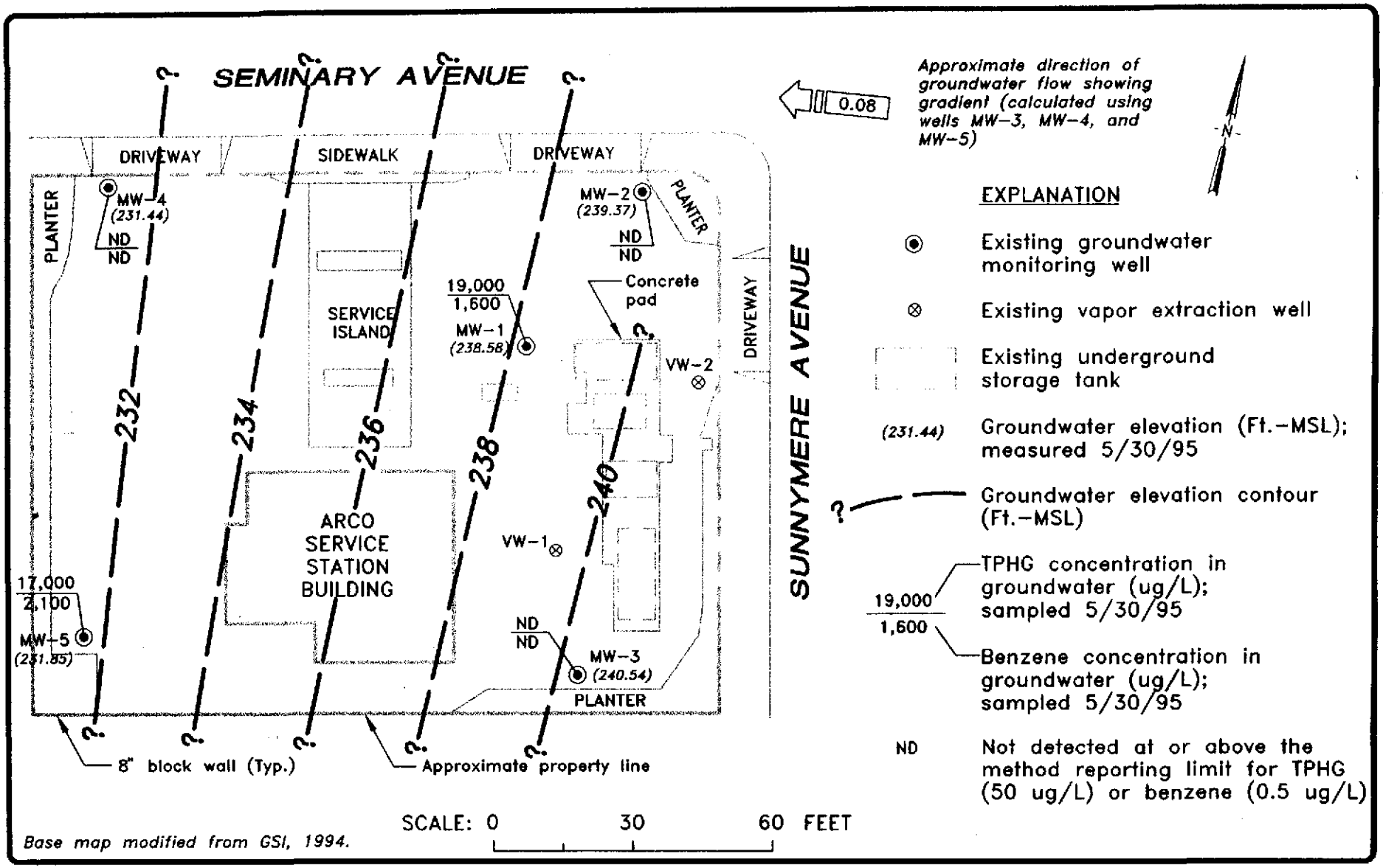
ARCO PRODUCTS COMPANY
SERVICE STATION 6002, 6235 SEMINARY AVE.
QUARTERLY GROUNDWATER MONITORING
OAKLAND, CALIFORNIA

SITE LOCATION

FIGURE 1

PROJECT NO. 805-131.03



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ARCO PRODUCTS COMPANY
SERVICE STATION 6002, 6235 SEMINARY AVENUE
QUARTERLY GROUNDWATER MONITORING
OAKLAND, CALIFORNIA

GROUNDWATER DATA
SECOND QUARTER 1995

FIGURE NO.
2
PROJECT NO.
805-131.03

FIELD REPORT
DEPTH TO WATER / FLOATING PRODUCT SURVEY

PROJECT # : 1775-241.01 STATION ADDRESS : 6235 Seminary Avenue DATE : 5/30/95

ARCO STATION # : 6002 FIELD TECHNICIAN : M. Ross / Darren Gamboa DAY : Tuesday

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-2**	OK	Yes	OK	Yes	Yes	9.93	9.93	NA	NA	19.6	
2	**MW-3**	OK	Yes	OK	Yes	Yes	7.91	7.91	NA	NA	24.5	
3	**MW-4**	OK	Yes	OK	Yes	Yes	11.47	11.47	NA	NA	24.2	
4	**MW-1**	OK	Yes	BAD	Yes	Yes	8.48	8.48	NA	NA	24.3	WATER IN BOX
5	**MW-5**	OK	Yes	OK	Yes	Yes	12.97	12.97	NA	NA	24.1	

SURVEY POINTS ARE TOP OF WELL CASINGS

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1.96

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-241.01 SAMPLE ID: MW-1

PURGED BY: M. Rossi / C. Gamboa CLIENT NAME: ARCO 6002

SAMPLED BY: M. Rossi / C. Gamboa LOCATION: OAKLAND, CA

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

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

CASING ELEVATION (feet/MSL):	NA	VOLUME IN CASING (gal.):	10.33
DEPTH TO WATER (feet):	7.98	CALCULATED PURGE (gal.):	31.00
DEPTH OF WELL (feet):	24.3	ACTUAL PURGE VOL. (gal.):	19.0

DATE PURGED: 5/30/95 Start (2400 Hr) 1121 End (2400 Hr) 1124

DATE SAMPLED: 5/30/95 Start (2400 Hr) 1130 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1123	10.5	6.19	6.37	68.1	clr	clr
1124	DRY	pvt. - 19.0 GALLONS				
1130	Recharge	6.58	6.78	67.6	cldy	TRACE

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

COLOR (COBALT 0 - 500): NA

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

Field QC samples collected at this well: NA

Parameters field filtered at this well: NA

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: Good LOCK #: ARCO

REMARKS: Dry at 19.0 Gallons

Meter Calibration: Date: 5/30/95 Time: 1005 Meter Serial #: 9210 Temperature °F: ___

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

Location of previous calibration: MW-2

Signature: Mike Ross Reviewed By: SK Page 1 of 5

1.94

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-241.01 SAMPLE ID: MW-2

PURGED BY: M. Ross / D. Cambria CLIENT NAME: ARCO 6002

SAMPLED BY: M. Ross / D. Cambria LOCATION: OAKLAND, CA

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

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

CASING ELEVATION (feet/MSL):	NA	VOLUME IN CASING (gal.):	5.01
DEPTH TO WATER (feet):	9.93	CALCULATED PURGE (gal.):	15.03
DEPTH OF WELL (feet):	17.6	ACTUAL PURGE VOL. (gal.):	8.5

DATE PURGED: 5/30/95 Start (2400 Hr) 1004 End (2400 Hr) 1007

DATE SAMPLED: 5/30/95 Start (2400 Hr) 1015 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1006	5.5	5.11	.287	66.1	BRN	HEAVY
1007		DRY at 8.5 GALLONS				
1015	RECHARGE	6.03	265	63.5	LGHT BRN	MOD

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

COLOR (COBALT 0 - 500): NA

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

Field QC samples collected at this well: NA

Parameters field filtered at this well: NA

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: GOOD LOCK #: ARCO

REMARKS: DRY at 8.5 GALLONS

Meter Calibration: Date: 5/30/95 Time: 1005 Meter Serial #: 9210 Temperature °F: 67.5

(EC 1000 1073 / 1000) (DI 39.2) (pH 7 707 / 700) (pH 10 995 / 1000) (pH 4 397 / —)

Location of previous calibration: ___

Signature: [signature] Reviewed By: SA Page 2 of 5

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WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-241.01 SAMPLE ID: MW-3

PURGED BY: M. Ross / D. Gamache CLIENT NAME: ARCO 6022

SAMPLED BY: M. Ross / D. Gamache LOCATION: OAKLAND, CA

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

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

CASING ELEVATION (feet/MSL):	NA	VOLUME IN CASING (gal.):	10.90
DEPTH TO WATER (feet):	7.81	CALCULATED PURGE (gal.):	32.71
DEPTH OF WELL (feet):	24.5	ACTUAL PURGE VOL. (gal.):	24.0

DATE PURGED: 5/30/95 Start (2400 Hr) 1026 End (2400 Hr) 1031

DATE SAMPLED: 5/30/95 Start (2400 Hr) 1040 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1028	11.0	6.47	310	64.1	Rusty	Trace
1030	22.0	6.38	359	64.3	Light Brn	Mod
1031		Dry	at 24.0	gallons		
1040	Recharge	6.49	315	63.6	Clr	Trace

D. O. (ppm): NA ODOR: Slight

COLOR (visual) NA (COBALT 0 - 500)

TURBIDITY (visual) NA (NTU 0 - 200 or 0 - 1000)

Field QC samples collected at this well: NA

Parameters field filtered at this well: NA

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: Good LOCK #: ARCO

REMARKS: Dry at 24.0 Gallons

Meter Calibration: Date: 5/30/95 Time: 1005 Meter Serial #: 921C Temperature °F: ___

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

Location of previous calibration: MW-2

Signature: Mike Ross Reviewed By: SK Page 3 of 5

Rev. 3, 2/94

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WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-241.01 SAMPLE ID: MW-4

PURGED BY: M. Ross / D. Gamboa CLIENT NAME: ARCO 6002

SAMPLED BY: M. Ross / D. Gamboa LOCATION: Oakland, CA

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

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

CASING ELEVATION (feet/MSL): N/A VOLUME IN CASING (gal.): 8.3

DEPTH TO WATER (feet): 11.47 CALCULATED PURGE (gal.): 24.95

DEPTH OF WELL (feet): 24.2 ACTUAL PURGE VOL. (gal.): 150

DATE PURGED: 5/30/95 Start (2400 Hr) 1049 End (2400 Hr) 1051

DATE SAMPLED: 5/30/95 Start (2400 Hr) 1058 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1050	7.5	6.53	297	67.4	Brn	Mod
1051	↓	DRY	at 15.0 GALLONS			
1058	Recharge	6.46	306	67.5	Brn	Mod

D. O. (ppm): NA ODOR: None

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

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

Field QC samples collected at this well: NA

Parameters field filtered at this well: NA

PURGING EQUIPMENT

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

SAMPLING EQUIPMENT

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

WELL INTEGRITY: Good LOCK #: ARCO

REMARKS: Dry at 150 GALLONS

Meter Calibration: Date: 5/30/95 Time: 1005 Meter Serial #: 9210 Temperature °F: ___

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

Location of previous calibration: MW-2

Signature: Mike Ross Reviewed By: SA Page 4 of 5

Rev. 3, 2/94

WATER SAMPLE FIELD DATA SHEET

EMCON ASSOCIATES

PROJECT NO: 1775-241.01 SAMPLE ID: MW-5

PURGED BY: M. Ross / D. Gamblin CLIENT NAME: ARCO 6002

SAMPLED BY: M. Ross / D. Gamblin LOCATION: OAKLAND, CA

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

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

CASING ELEVATION (feet/MSL): NA VOLUME IN CASING (gal.): 7.46

DEPTH TO WATER (feet): 12.97 CALCULATED PURGE (gal.): 22.40

DEPTH OF WELL (feet): 24.4 ACTUAL PURGE VOL (gal.): 12.0

DATE PURGED: 5/30/95 Start (2400 Hr) 1141 End (2400 Hr) 1145

DATE SAMPLED: 5/30/95 Start (2400 Hr) 1150 End (2400 Hr) —

TIME (2400 Hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25° C)	TEMPERATURE (°F)	COLOR (visual)	TURBIDITY (visual)
1143	7.5	6.29	603	68.1	Yellow/cldy	mod
1145	DRY at 12.0		GALLONS			
1150	Recharge	6.26	599	66.7	Yellow/cldy	mod

D. O. (ppm): NA ODOR: Slight

COLOR (COBALT 0 - 500): NA

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

Field QC samples collected at this well: NA

Parameters field filtered at this well: NA

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: GOOD LOCK #: ARCO

REMARKS: DRY at 120 GALLONS

Meter Calibration: Date: 9/30/95 Time: 1005 Meter Serial #: 9210 Temperature °F: ___

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

Location of previous calibration: MW-2

Signature: Mike Ross Reviewed By: SH Page 5 of 5

Columbia Analytical Services, Inc.

June 13, 1995

Service Request No. S950680

John Young
EMCON
1921 Ringwood Avenue
San Jose, CA 95131

Re: **ARCO Facility No. 6002 / EMCON Project No. 0805-131.03**

Dear Mr. Young:

Attached are the results of the water sample(s) submitted to our lab on May 30, 1995. For your reference, these analyses have been assigned our service request number S950680.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and CAS is not responsible for use of less than the complete report. Results apply only to the samples analyzed.

Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.

Steven L. Green
Project Chemist

Annelise J. Bazar
Regional QA Coordinator

SLG/ajb

01

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the U. S. EPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the paper industry for Air and Stream Improvement
ND	Not Detected at or above the MRL
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	EMCON	**Service Request:**	S950680
Project:	ARCO Facility No. 6002/EMCON Project No. 0805-131.03	**Date Collected:**	5/30/95
Sample Matrix:	Water	**Date Received:**	5/30/95
		Date Extracted:	NA
		Date Analyzed:	6/7/95

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

Analyte:	**TPH as Gasoline**	**Benzene**	**Toluene**	**Ethyl-benzene**	**Xylenes, Total**
Units:	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
Method Reporting Limit:	50	0.5	0.5	0.5	0.5
Sample Name	**Lab Code**				
MW-2 (17)	S950680-001	ND	ND	ND	ND	ND
MW-3 (24)	S950680-002	ND	ND	ND	ND	ND
MW-4 (24)	S950680-003	ND	ND	ND	ND	ND
MW-1 (24)	S950680-004	19,000	1,600	30	890	1,400
MW-5 (24)	S950680-005	17,000	2,100	250	1,000	520
Method Blank	S950607-WB1	ND	ND	ND	ND	ND

Approved By: _____ Date: 6/13/95

5ABTXGAS/061694

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	EMCON	**Service Request:**	S950680
Project:	ARCO Facility No. 6002/EMCON Project No. 0805-131.03	**Date Collected:**	5/30/95
Sample Matrix:	Water	**Date Received:**	5/30/95
		Date Extracted:	NA
		Date Analyzed:	6/7/95

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

Sample Name: MW-2 (17)
Lab Code: S950680-001

	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	241	230	96	92	67-121	5

Approved By: _____ Date: 6/13/95

DMS1S/060194

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON
Project: ARCO Facility No. 6002/EMCON Project No. 0805-131.03
Sample Matrix: Water

Service Request: S950680
Date Collected: 5/30/95
Date Received: 5/30/95
Date Extracted: NA
Date Analyzed: 6/7/95

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

Sample Name	Lab Code	Percent Recovery α,α,α-Trifluorotoluene
MW-2 (17)	S950680-001	91
MW-3 (24)	S950680-002	96
MW-4 (24)	S950680-003	94
MW-1 (24)	S950680-004	94
MW-5 (24)	S950680-005	96
MW-2 (17) (MS)	S950680-001MS	105
MW-2 (17) (DMS)	S950680-001DMS	102
Method Blank	S950607-WB1	91

CAS Acceptance Limits: 69-116

Approved By: _____ Date: 6/13/95

SUR1/062994

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: EMCON **Service Request:** S950680
Project: ARCO Facility No. 6002/EMCON Project No. 0805-131.03 **Date Analyzed:** 6/7/95

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

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	25.2	101	85-115
Toluene	25	24.4	98	85-115
Ethylbenzene	25	24.8	99	85-115
Xylenes, Total	75	71.9	96	85-115
Gasoline	250	247	99	90-110

Approved By: _____ Date: 6/13/95

ICV25AL/060194

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. 17075.00

Chain of Custody

ARCO Facility no. 6002	City (Facility) Oakland	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	Contract number
Consultant name EMCON	Address (Consultant) 1921 Ringwood Ave, San Jose, CA 95131		

	Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
1	MW-2	(17)			X		X	HCL	5/30/95	1015		X											
2	MW-3	(24)			X		X	HCL	5/30/95	1040		X											
3	MW-4	(24)			X		X	HCL	5/30/95	1058		X											
4	MW-1	(24)			X		X	HCL	5/30/95	1130		X											
5	MW-5	(24)			X		X	HCL	5/30/95	1150		X											

Method of shipment: Sampler will deliver

Special detection Limit/reporting: Lowest Possible

Special QA/QC: As Normal

Remarks: 2-40ml HCL VOAs

#0805-131.03

Lab number: 9506180

Turnaround time

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

Condition of sample: ok		Temperature received: Cool	
Relinquished by sampler: Mike Ross	Date: 5/30/95 Time: 1610	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory: Joanne Brown	Date: 5/30/95 Time: 1610

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

APPC-3292 (2-91)

Due 6/13