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

Date December 30, 1994
Project 0805-131.01

To:

Ms. Juliet Shin
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

We are enclosing:

Copies	Description
1	Third quarter 1994 groundwater monitoring report for ARCO service station 6002, Oakland, California

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

Comments:

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

David Larsen

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

Date: December 30, 1994

Re: ARCO Station # 6002 • 6235 Seminary Avenue • Oakland, CA
Third Quarter 1994 Groundwater Monitoring Report

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

Submitted by:

Michael R. Whelan

Michael R. Whelan
Environmental Engineer

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

December 20, 1994
Project 0805-131.01

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

Re: Third quarter 1994 groundwater monitoring program results, ARCO service station 6002, Oakland, California

Dear Mr. Whelan:

This letter presents the results of the third quarter 1994 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

In January 1994, RESNA conducted an initial subsurface environmental investigation to assess the extent of impact of gasoline hydrocarbons on the subsurface soils and groundwater at the site. This investigation included installation of one groundwater monitoring well, MW-1, and two vadose wells VW-1 and VW-2.

In June 1994, a second phase of subsurface investigation was conducted by GeoStrategies, Inc., which included installation of four additional groundwater monitoring wells, MW-2 through MW-5.

Groundwater monitoring and sampling at this site was initiated in January 1994. Currently, five groundwater monitoring wells, and two vadose wells exist on site. For additional background information please refer to *Additional On-Site Subsurface Investigation and Second Quarter 1994 Groundwater Monitoring Report*, (GeoStrategies, Inc., August 29, 1994).

Wells MW-1 through MW-5 are monitored quarterly.

MONITORING PROGRAM FIELD PROCEDURES AND RESULTS

The third quarter 1994 groundwater monitoring event was performed by Integrated Wastestream Management, Inc. (IWM), on September 24, 1994. Field work performed by IWM during this quarter included (1) measuring depths to groundwater and subjectively analyzing groundwater for the presence of floating product in wells MW-1 through MW-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. The results of IWM's field work were transmitted to EMCON in a report dated October 14, 1994. These data are presented in Appendix A.

ANALYTICAL PROCEDURES

Groundwater samples collected during third quarter monitoring were analyzed for total petroleum hydrocarbons as gasoline (TPHG), and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Groundwater samples were prepared for analysis by U.S. Environmental Protection Agency (EPA) method 5030 (purge and trap). Groundwater was analyzed for TPHG by the methods accepted by the Department of Toxic Substances Control, California EPA (Cal-EPA), and referenced in the *Leaking Underground Fuel Tank (LUFT) Field Manual* (State Water Resources Control Board, May 1988, revised October 1989). Samples were analyzed for BTEX by EPA 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 for samples from petroleum-hydrocarbon-impacted sites in the *Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites* (August 10, 1990).

MONITORING PROGRAM RESULTS

Results of the third quarter 1994 groundwater monitoring event are summarized in Table 1 and illustrated in Figure 2. 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 third quarter 1994 certified analytical report and chain-of-custody documentation are included in Appendix B.

MONITORING PROGRAM EVALUATION

Groundwater elevation data collected on September 24, 1994, illustrate 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 third quarter of 1994.

Groundwater samples collected from wells MW-2 and MW-3 did not contain detectable concentrations of TPHG or BTEX. Groundwater samples collected from wells MW-1 and MW-5 contained 13,000 and 28,000 parts per billion (ppb) TPHG, and 2,900 and 4,000 ppb benzene, respectively. Groundwater samples collected from well MW-4 contained 140 ppb TPHG, but did not contain detectable concentrations of benzene (<0.5 ppb). Similar analytical results were reported for wells MW-1, MW-2, MW-3, and MW-5 during previous monitoring events. The result of 140 ppb TPHG reported for well MW-4 represents the first time that gasoline constituents have been detected in groundwater samples collected from that well.

LIMITATIONS

Field procedures were performed by, and field data were acquired from, IWM. EMCON does not warrant the accuracy of data supplied by IWM. EMCON's scope of work was limited to interpreting field data, which included evaluating trends in the groundwater gradient, groundwater flow direction, and dissolved-petroleum-hydrocarbon concentrations beneath the site.

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

SITE STATUS UPDATE

This update reports site activities performed during the third quarter of 1994 and the anticipated site activities for the fourth quarter of 1994.

Third Quarter 1994 Activities

- Prepared and submitted quarterly groundwater monitoring report for second quarter 1994.
- Performed quarterly groundwater monitoring for third quarter 1994.

Work Anticipated Fourth Quarter 1994

- Prepare and submit quarterly groundwater monitoring report for third quarter 1994.
- Perform quarterly groundwater monitoring for fourth quarter 1994.
- Prepare workplan for additional assessment.

Please call if you have questions.

Sincerely,

EMCON Associates

David Larsen
Sampling Coordinator

Mark Smolley, R.G. 4650
Senior Project Geologist

Attachment: Table 1 - Groundwater Monitoring Data, Third Quarter 1994
Table 2 - Historical Groundwater Elevation Data
Table 3 - Historical Groundwater Analytical Data (TPHG and BTEX)
Figure 1 - Site Location
Figure 2 - Groundwater Data, Third Quarter 1994
Appendix A - Field Data Report, Integrated Wastestream Management, October 14, 1994
Appendix B - Certified Analytical Report and Chain-of-Custody Documentation, Third Quarter 1994

Table 1
Groundwater Monitoring Data
Third Quarter 1994
Summary Report

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, California

Date: 12-09-94
Project Number: 0805-131.01

Well Desig-nation	Water Level Field Date	TOC Elevation	Depth to Water	Ground-Water Elevation	Floating Product Thickness	Ground-Water Flow Direction	Hydraulic Gradient	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ft-MSL	feet	ft-MSL	feet	MWN	foot/foot		ppb	ppb	ppb	ppb	ppb
MW-1	09-24-94	247.06	8.84	238.22	ND	WSW	0.08	09-24-94	13000	2900	37	830	640
MW-2	09-24-94	249.30	10.02	239.28	ND	WSW	0.08	09-24-94	<50	<0.5	<0.5	<0.5	<0.5
MW-3	09-24-94	248.35	8.14	240.21	ND	WSW	0.08	09-24-94	<50	<0.5	<0.5	<0.5	<0.5
MW-4	09-24-94	242.91	11.81	231.10	ND	WSW	0.08	09-24-94	140	<0.5	<0.5	<0.9	<0.5
MW-5	09-24-94	244.82	13.60	231.22	ND	WSW	0.08	09-24-94	28000	4000	<50	2400	2100

TOC = Top of casing
ft-MSL = Elevation in feet, relative to mean sea level
MWN = Ground-water flow direction and gradient apply to the entire monitoring well network
TPHG = Total petroleum hydrocarbons as gasoline
ppb = Parts per billion or micrograms per liter (µg/l)
ND = None detected
WSW = West-southwest

esj/h:\6002\6002mdb.xls\Table 1:dcl
0805-131.01

Table 2
Historical Groundwater Elevation Data
Summary Report

ARCO Service Station 6002
6235 Seminary Avenue, Oakland, California

Date: 12-09-94
Project Number: 0805-131.01

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-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-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-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-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

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

Table 3
Historical Groundwater Analytical Data
Summary Report

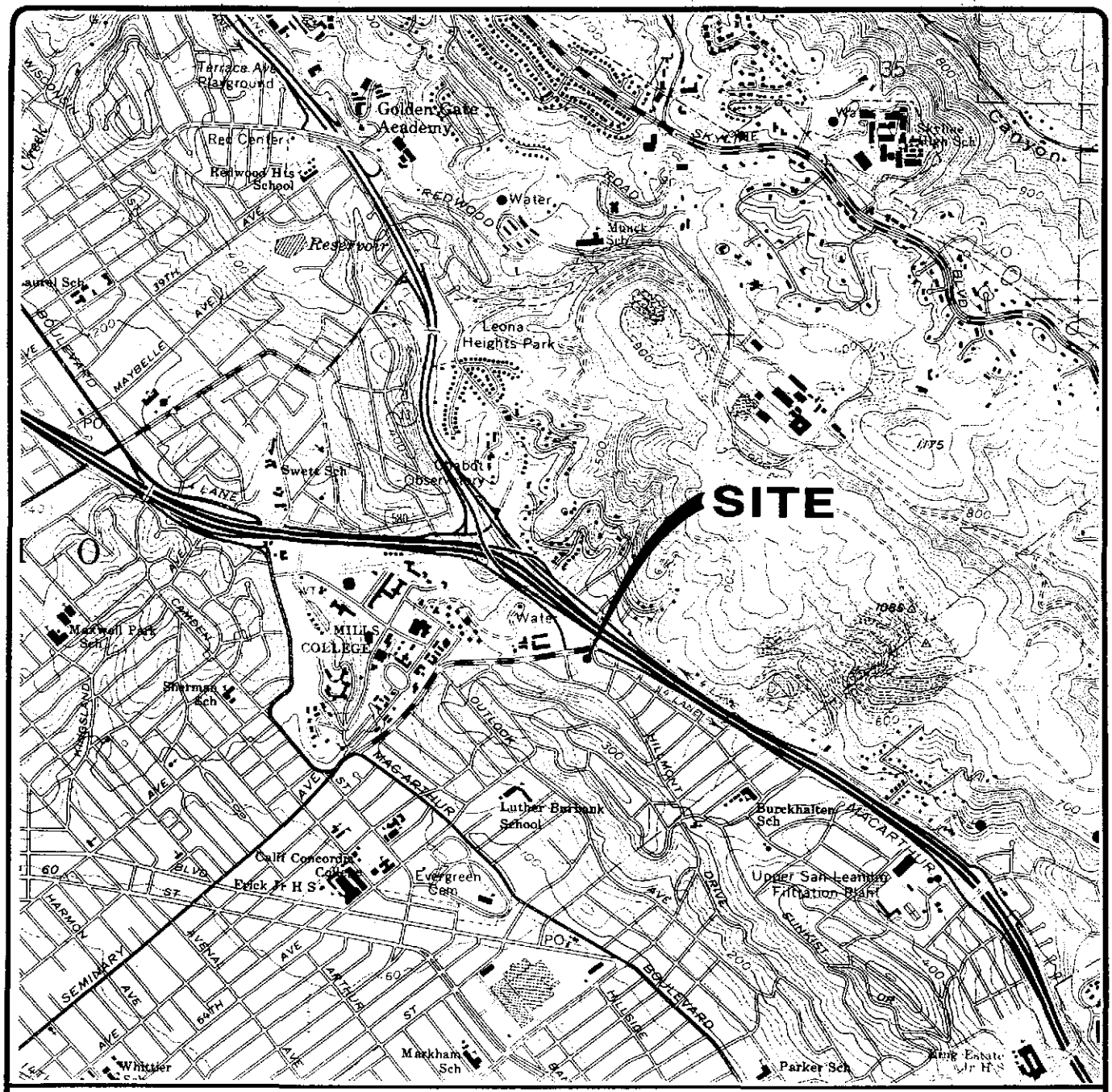
ARCO Service Station 6002
6235 Seminary Avenue, Oakland, California

Date: 12-08-94
Project Number: 0805-131.01

Well Designation	Water Sample Field Date	TPHG	Benzene	Toluene	Ethyl-benzene	Total Xylenes
		ppb	ppb	ppb	ppb	ppb
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-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-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-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-5	07-08-94	41000	3300	<50	2200	2900
MW-5	09-24-94	28000	4000	<50	2400	2100

TPHG = Total petroleum hydrocarbons as gasoline
ppb = Parts per billion or micrograms per liter (µg/l)

152753



12/94

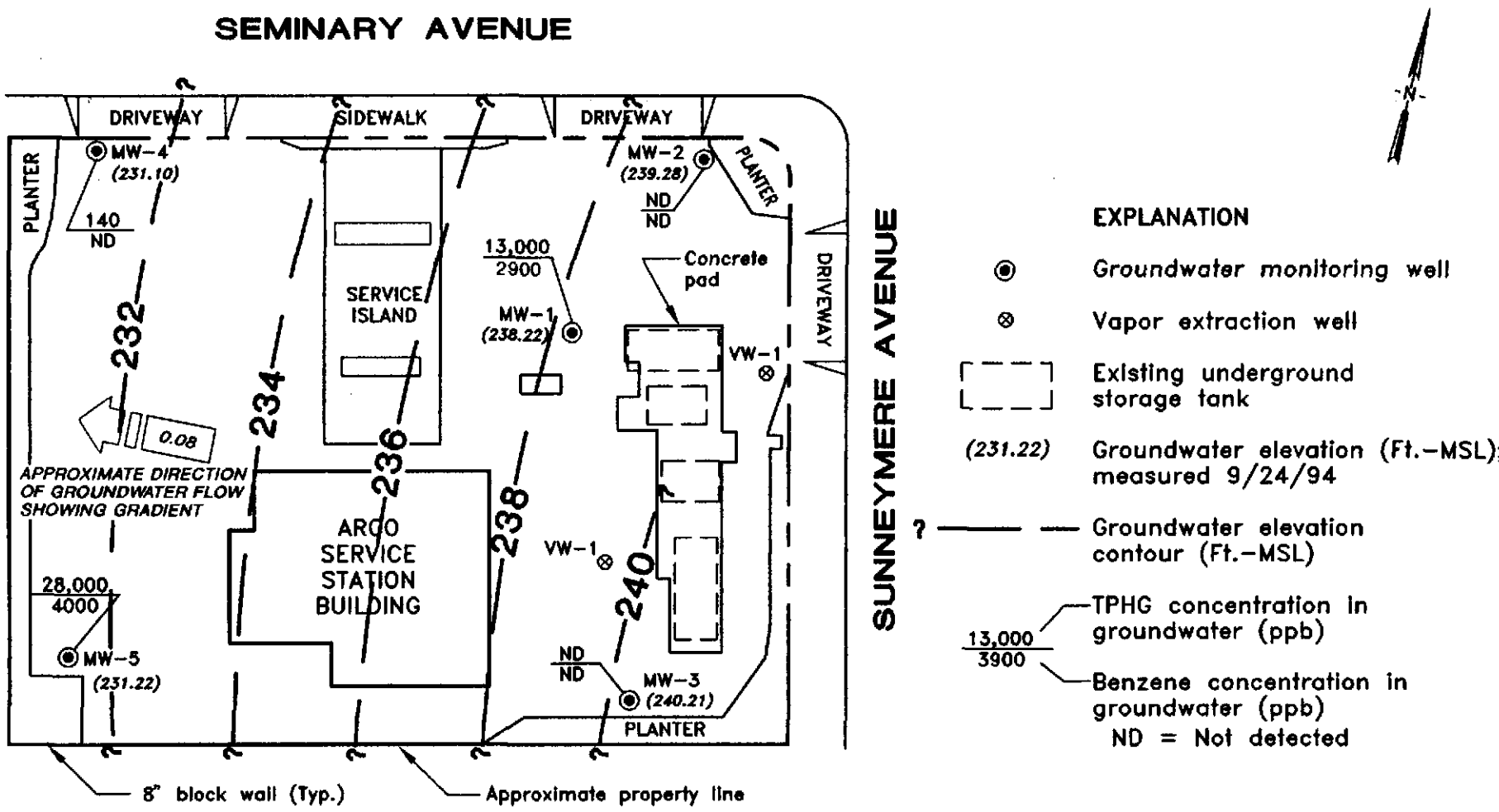
EMCON Associates

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

SITE LOCATION

FIGURE 1

PROJECT NO. 805-131.01



Base map modified from GSI, 1994.

EMCON Associates

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

GROUNDWATER DATA

FIGURE
2
PROJECT NO.
805-131.01

APPENDIX A

FIELD DATA REPORT, INTEGRATED WASTESTREAM MANAGEMENT, OCTOBER 14, 1994

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

October 14, 1994

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

Dear Mr. Young:

Attached are the field data sheets and analytical results for quarterly ground water sampling at ARCO Facility No. 6002 in Oakland, California. Integrated Wastestream Management measured the depth to water and collected samples from wells at this site on September 24, 1994.

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

Please call us if you have any questions.

Sincerely,
Integrated Wastestream Management

Tom DeLon
Project Manager

Walter H. Howe
Registered Geologist

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

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

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

A6002Q3.XLS

Summary of Ground Water Sample Analyses for ARCO Facility A-6002, Oakland, California

WELL NUMBER	MW-1	MW-2	MW-3	MW-4	MW-5
DATE SAMPLED	9/24/94	9/24/94	9/24/94	9/24/94	9/24/94
DEPTH TO WATER	8.84	10.02	8.14	11.81	13.60
SHEEN	NONE	NONE	NONE	NONE	NONE
PRODUCT THICKNESS	NA	NA	NA	NA	NA
TPHg	13,000	ND	ND	140	28,000
BTEX					
BENZENE	2,900	ND	ND	ND	4,000
TOLUENE	37	ND	ND	ND	<50#
ETHLYBENZENE	830	ND	ND	<0.9#	2,400
XYLENES	640	ND	ND	ND	2,100

FOOTNOTES:

Concentrations reported in ug/L (ppb)
TPHg = Total Purgeable Petroleum Hydrocarbons (USEPA Method 8015 Modified)
BTEX Distinction (USEPA Method 8020)
PCE = Tetrachloroethene (USEPA Method 8010)
* = Well inaccessible

** = Not sampled per consultant request
DCE = cis-1, 2-Dichloroethene (USEPA Method 8010)
TCE = Trichloroethene (USEAP Method 8010)
ND = Not Detected
NA = Not applicable
FP = Floating product
# = See laboratory analytical report

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

FIELD REPORT

Depth To Water / Floating Product Survey

Site Arrival Time: 1415
Site Departure Time: 1659
Weather Conditions: Sunny Warm

DTW: Well Box or Well Casing (circle one)

Project No.: _____ **Location:** 6235 Seminary ave. OAK **Date:** Sept 24, 1994

Client / Station#: Arco 6002 **Field Technician:** Vince Valdes **Day of Week:** Saturday

DTW ORDER	WELL ID	SURFACE SEAL	LID SECURE	GASKET	LOCK	EXPANDING CAP	TOTAL DEPTH (Feet)	FIRST DEPTH TO WATER (Feet)	SECOND DEPTH TO WATER (Feet)	DEPTH TO FLOATING PRODUCT (Feet)	FLOATING PRODUCT THICKNESS (Feet)	SHEEN (Y=YES, N=NO) FP=FLOATING PRODUCT	COMMENTS	MATERIALS
4	mw-1	OK	Yes	OK	OK	OK	24.10	8.84	8.84	N/A	N/A	N	4"	15/16
1	mw-2	OK	Yes	OK	OK	OK	17.45	10.02	10.02	N/A	N/A	N	4"	15/16
2	mw-3	OK	Yes	OK	OK	OK	24.40	8.14	8.14	N/A	N/A	N	4"	15/16
3	mw-4	OK	Yes	OK	OK	OK	24.00	11.81	11.81	N/A	N/A	N	4"	15/16
5	mw-5	OK	Yes	OK	OK	OK	24.39	13.60	13.60	N/A	N/A	N	4"	15/16

PAGE 2 OF 3 DATE: 9-24-94 CLIENT/STATION #: Arco 6002 ADDRESS: 6235 Seminary ave. OAK

WELL ID: MW-3 TD 24.40 − DTW 8.14 × 0.66 Gal./Linear Ft. × 3 Casing Volume = 32.19 Calculated Purge

DATE PURGED: 9-24-94 START (2400 HR): 1520 END (2400 HR) 1528
DATE SAMPLED: 9-24-94 TIME (2400 HR): 1530 DTW: 19.4

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1522	1	7.04	6.71	71.0	clear
1524	12	6.77	6.49	70.6	clear
1526	23	6.64	7.30	70.0	clear
1528	27	6.63	7.79	69.8	clear

Total purge: 27
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Well pumped dry at 27 gallons.

WELL ID: MW-2 TD 17.45 − DTW 10.02 × 0.66 Gal./Linear Ft. × 3 Casing Volume = 14.71 Calculated Purge

DATE PURGED: 9-24-94 START (2400 HR): 1536 END (2400 HR) 1544
DATE SAMPLED: 9-24-94 TIME (2400 HR): 1546 DTW: 14.8

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1538	2	6.79	7.15	70.9	clear
1540	9	6.80	7.75	70.1	clear
1542	11	6.77	8.88	69.9	clear
1544	12	6.76	8.93	69.7	clear

Total purge: 12
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Well pumped dry at 9, 11, and again at 12 gallons.

WELL ID: MW-4 TD 24.0 − DTW 11.81 × 0.66 Gal./Linear Ft. × 3 Casing Volume = 24.13 Calculated Purge

DATE PURGED: 9-24-94 START (2400 HR): 1555 END (2400 HR) 1603
DATE SAMPLED: 9-24-94 TIME (2400 HR): 1605 DTW: 18.8

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1557	2	6.93	8.44	70.8	clear
1559	12	6.95	9.23	70.2	clear
1601	18	6.78	10.49	69.8	clear
1603	19	6.76	10.88	69.7	clear

Total purge: 19
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Well pumped dry at 18 and again at 19 gallons.

WELL ID: MW-1 TD 24.10 − DTW 8.84 × 0.66 Gal./Linear Ft. × 3 Casing Volume = 30.21 Calculated Purge

DATE PURGED: 9-24-94 START (2400 HR): 1610 END (2400 HR) 1619
DATE SAMPLED: 9-24-94 TIME (2400 HR): 1623 DTW: 17.6

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1612	2	6.70	9.64	70.3	clear
1614	10	6.69	16.00	70.0	clear
1617	21	6.65	12.97	69.7	clear
1619	26	6.64	19.46	69.6	clear

Total purge: 26
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Well pumped dry at 26 gallons.

PRINT NAME: Vince Valdes SIGNATURE: Vince Valdes

CASING DIAMETER (inches): 2 3 4 6 8 12 Other:
GALLON/LINEAR FOOT: 0.17 0.38 0.66 1.5 2.6 5.8 Other:

 DATE: 9-24-94 CLIENT/STATION #: Arco 6002 ADDRESS: 6235 Seminary Ave. OAK

WELL ID: MW-5 TD 24.39 - DTW 13.60 X Gal. 0.66 / Linear Ft. X Casing 3 / Volume = Calculated 21.36 / Purge

DATE PURGED: 9-24-94 TIME (2400 HR): 1628 DTW: 16.35
DATE SAMPLED: 9-24-94 TIME (2400 HR): 1638 DTW: 18.5

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	E.C. (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1629	1	6.75	11.65	71.0	clear
1631	10	6.65	Off scale	70.4	clear
1633	15	6.68	"	69.8	clear
1635	17	6.67	"	69.7	clear

Total purge: 17
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: well pumped dry at 17 gallons

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

DATE PURGED: TIME (2400 HR): DTW:
DATE SAMPLED: TIME (2400 HR): DTW:

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

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

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

DATE PURGED: TIME (2400 HR): DTW:
DATE SAMPLED: TIME (2400 HR): DTW:

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

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

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

DATE PURGED: TIME (2400 HR): DTW:
DATE SAMPLED: TIME (2400 HR): DTW:

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

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

PRINT NAME: Vince Valdes SIGNATURE: Vince Valdes

APPENDIX B

CERTIFIED ANALYTICAL REPORT AND CHAIN-OF-CUSTODY DOCUMENTATION, THIRD QUARTER 1994

Columbia Analytical Services, Inc.

October 11, 1994

Service Request No. S941118

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

RECEIVED
OCT 13 1994

Re: **ARCO Facility No. 6002**

Dear Ms. Austin/Mr. DeLon:

Attached are the results of the water samples submitted to our lab on September 26, 1994. For your reference, these analyses have been assigned our service request number S941118.

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.

Carol J. Klein
Laboratory Manager

Annelise J. Bazar
Regional QA Coordinator

CJK/ajb

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

Acronyms

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

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	IWM	**Service Request:**	S941118
Project:	ARCO Facility 6002	**Date Collected:**	9/24/94
Sample Matrix:	Water	**Date Received:**	9/26/94
		Date Extracted:	NA
		Date Analyzed:	10/6,7/94

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

Analyte:	**TPH as Gasoline**	**Benzene**	**Toluene**	**Ethyl-benzene**	**Xylenes, Total**
Units:	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
Method Reporting Limit:	50	0.5	0.5	0.5	0.5
Sample Name **Lab Code**					
MW-1 (17.6) S941118-001	13,000	2,900	37	830	640
MW-2 (14.8) S941118-002	ND	ND	ND	ND	ND
MW-3 (19.4) S941118-003	ND	ND	ND	ND	ND
MW-4 (18.8) S941118-004	140	ND	ND	<0.9 *	ND
MW-5 (18.5) S941118-005	28,000	4,000	<50 **	2,400	2,100
Method Blank S941006-WB	ND	ND	ND	ND	ND
Method Blank S941007-WB	ND	ND	ND	ND	ND

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

Approved By: _____ Date: October 11, 1994

5ABTXGAS/061694

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility 6002
Sample Matrix: Water

Service Request: S941118
Date Collected: 9/24/94
Date Received: 9/26/94
Date Extracted: NA
Date Analyzed: 10/6,7/94

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

Sample Name	Lab Code	Percent Recovery α,α,α-Trifluorotoluene
MW-1 (17.6)	S941118-001	94
MW-2 (14.8)	S941118-002	82
MW-3 (19.4)	S941118-003	92
MW-4 (18.8)	S941118-004	94
MW-5 (18.5)	S941118-005	89
MW-3 (19.4) MS	S941118-003MS	92
MW-3 (19.4) DMS	S941118-003DMS	92
Method Blank	S941006-WB	87
Method Blank	S941007-WB	88

CAS Acceptance Limits: 69-116

Approved By: _____ Date: October 11, 1994

SUR1/062994

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility 6002

Service Request: S941118
Date Analyzed: 10/6/94

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

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	25.4	102	85-115
Toluene	25	24.4	98	85-115
Ethylbenzene	25	24.8	99	85-115
Xylenes, Total	75	72.3	96	85-115
Gasoline	250	236	94	90-110

Approved By: _____ Date: October 11 1994

ICV25AL/060194

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	IWM	**Service Request:**	S941118
Project:	ARCO Facility 6002	**Date Collected:**	9/23/94
Sample Matrix:	Water	**Date Received:**	9/26/94
		Date Extracted:	NA
		Date Analyzed:	10/3/94

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

Sample Name: MW-3 (19.4)
Lab Code: S941118-003

	Spike Level		Sample	Spike Result		Percent Recovery		CAS Acceptance	Relative Percent
Analyte	MS	DMS	**Result**	MS	DMS	MS	DMS	Limits	**Difference**
Benzene	25	25	ND	26.9	26.9	108	108	75-135	<1
Toluene	25	25	ND	25.8	25.7	103	103	73-136	<1
Ethylbenzene	25	25	ND	26.5	26.2	106	105	69-142	1

Approved By: _____ Date: October 11, 1994

DMS1S/060194

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ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. IWM-94-5CC

Chain of Custody

ARCO Facility no. A 6002	City (Facility) OAKland	Project manager (Consultant) Tom De Son - B Seminski	Laboratory name Columbia
ARCO engineer M. W.	Telephone no. (ARCO) 4155712434	Telephone no. (Consultant) 408/9428955	Fax no. (Consultant) 408/9421499
Consultant name IWM - G.S.I.	Address (Consultant) 950 Ames av. Milp. CA 95035		Contract number 07077

Method of shipment: CAS COURIER

	Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid (HCL)	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☒ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS Lead EPA 7420/7421 ☐		
	FB-1	6	2		✓		✓	✓	9-24-94	1423		✓	✓										
7.6	MW-1	1	2		✓		✓	✓	"	1623		✓	✓										
18	MW-2	2	2		✓		✓	✓	"	1546		✓	✓										
7.4	MW 3	3	2		✓		✓	✓	"	1530		✓	✓										
8.8	MW-4	4	2		✓		✓	✓	"	1605		✓	✓										
8.5	MW 5	5	2		✓		✓	✓	"	1638		✓	✓										

Special detection, Limit/reporting

Special QA/QC

Remarks: Hold On FB-1

Lab number: 9941118

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

Condition of sample: Good

Temperature received: Cool

Relinquished by sampler: [signature]	Date 9/26/94	Time 800	Received by: [signature]			
Relinquished by: [signature]	Date 9/26/94	Time 1110	Received by: [signature]	9/26/94		1110
Relinquished by	Date	Time	Received by laboratory		Date	Time

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