PACIFIC
ENVIRONMENTAL
GROUP, INC.

Quarterly Groundwater Monitoring Report and Remedial System Performance Evaluation Third Quarter 1996

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Prepared for

Mr. Paul Supple
ARCO Products Company

December 16, 1996

Prepared by

Pacific Environmental Group, Inc.
2025 Gateway Place, Suite 440
San Jose, California 95110

Project 330-109.2C

Shaw Garakani
Project Engineer

R. Lee Dooley
Senior Geologist
CEG 1006

Date: December 16, 1996
Quarter: 3Q96

ARCO QUARTERLY GROUNDWATER MONITORING REPORT

Facility No.: 4931 Address: 731 West MacArthur Boulevard at West Street
Oakland, California

ARCO Environmental Engineer: Paul Supple
Consulting Co./Contact Person: Pacific Environmental Group, Inc./Shaw Garakani
Consultant Project No.: 330-109.2C
Primary Agency/Regulatory ID No.: Alameda County Health Care Services Agency

WORK PERFORMED THIS QUARTER (Third - 1996):

1. Performed third quarter 1996 groundwater monitoring event.
2. Prepared third quarter 1996 groundwater monitoring report.
3. Continued and expanded intrinsic bioremediation enhancement program.

WORK PROPOSED FOR NEXT QUARTER (Fourth - 1996):

1. Perform fourth quarter 1996 groundwater monitoring event.
2. Prepare fourth quarter 1996 groundwater monitoring report.
3. Continue bioremediation enhancement program.
4. Perform intrinsic bioremediation evaluation.

Current Phase of Project:	Monitoring/Remediation	(Assmnt, Remed., etc.)
Frequency of Groundwater Sampling:	Quarterly, Semiannually, and Annually	(Quarterly, etc.)
Frequency of Groundwater Monitoring:	Quarterly	(Monthly, etc.)
Is Free Product (FP) Present On-Site:	No	(Yes/No)
FP Recovered this Quarter:	None	(gallons)
Cumulative FP Recovered to Date:	Unknown	(gallons)
Bulk Soil Removed This Quarter:	None	(cubic yards)
Bulk Soil Removed to Date:	Unknown	(cubic yards)
Current Remediation Techniques:	Intrinsic Bioremediation Enhancement	(SVE/Sparge/FP Removal, etc.)
Approximate Depth to Groundwater:	7.2 to 11.6	(Measure Feet)
Groundwater Gradient:	Southwest	(Direction)
	0.02	(Magnitude)
Period TPPH-g/Benzene Removed:	0.0/0.0	(gallons)
Cumulative TPPH-g/Benzene Removed:	0.45/0.06	(gallons)

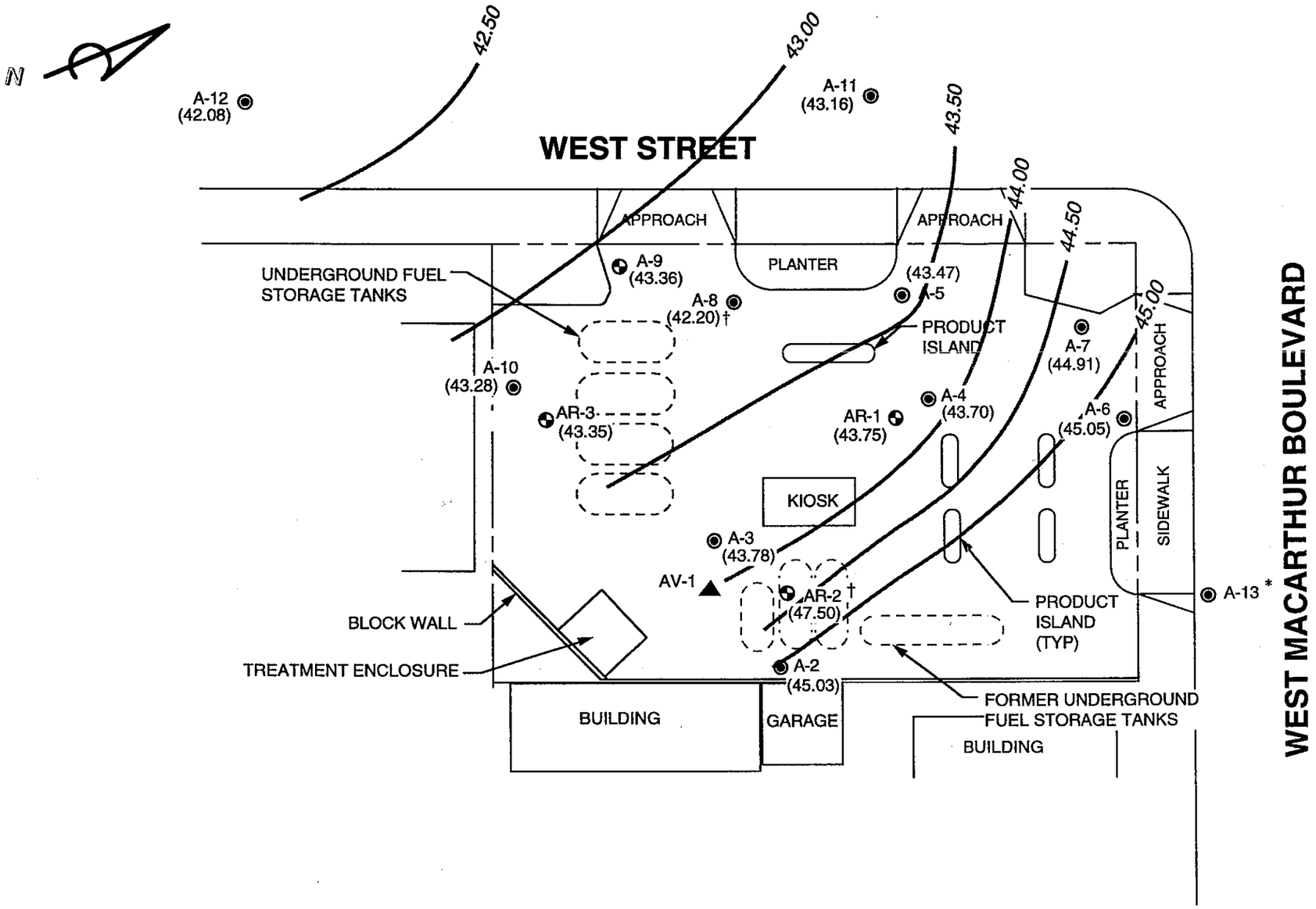
DISCUSSION:

- Hydrocarbon concentrations in groundwater are within historic levels.
- Based on ACHCSA's approval the GWE system has been deactivated and EBMUD sewer discharge permit relinquished. Plume appears stable.
- Intrinsic bioremediation enhancement program utilizing ORC units is in progress (Attachment D).
- Well A-13 was not sampled due to being asphalted over.
- Groundwater sampling frequency at Wells A-8 and A-9 has been changed from annually to semiannually (second and fourth quarters), to accommodate bioremedation enhancement program at these wells. (Please refer to Attachment D for details.)
- Groundwater sampling frequency at Well A-13 has been reduced from quarterly to annually during fourth quarter.
- Wells AR-1 and AR-2 have been removed from the sampling program.

ATTACHMENTS:

- Table 1 - Groundwater Sampling Schedule
- Table 2 - Groundwater Elevation and Analytical Data
- Figure 1 - Groundwater Elevation Contour Map
- Figure 2 - TPPH-g/Benzene Concentration Map
- Attachment A - Historical Liquid Surface Elevation and Groundwater Analytical Data Tables
- Attachment B - Field and Laboratory Procedures
- Attachment C - Certified Analytical Reports, Chain-of-Custody Documentation, and Field Data Sheets
- Attachment D - Remedial System Performance Evaluation

cc: Mr. Kevin Graves, Regional Water Quality Control Board - S.F. Bay Region
Ms. Susan Hugo, Alameda County Health Care Services Agency



LEGEND

A-7 ◉ GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

AR-3 ⊕ GROUNDWATER EXTRACTION WELL LOCATION AND DESIGNATION

AV-1 ▲ SOIL VAPOR WELL LOCATION AND DESIGNATION

(45.05) GROUNDWATER ELEVATION IN FEET - MSL, 8-22-96

43.00 GROUNDWATER ELEVATION CONTOUR IN FEET - MSL, 8-22-96

* WELL INACCESSIBLE

† NOT USED IN CONTOURING

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

APPROXIMATE GRADIENT = 0.02

SOURCE: MAP FROM GEO STRATEGIES INC. DATED 6-94

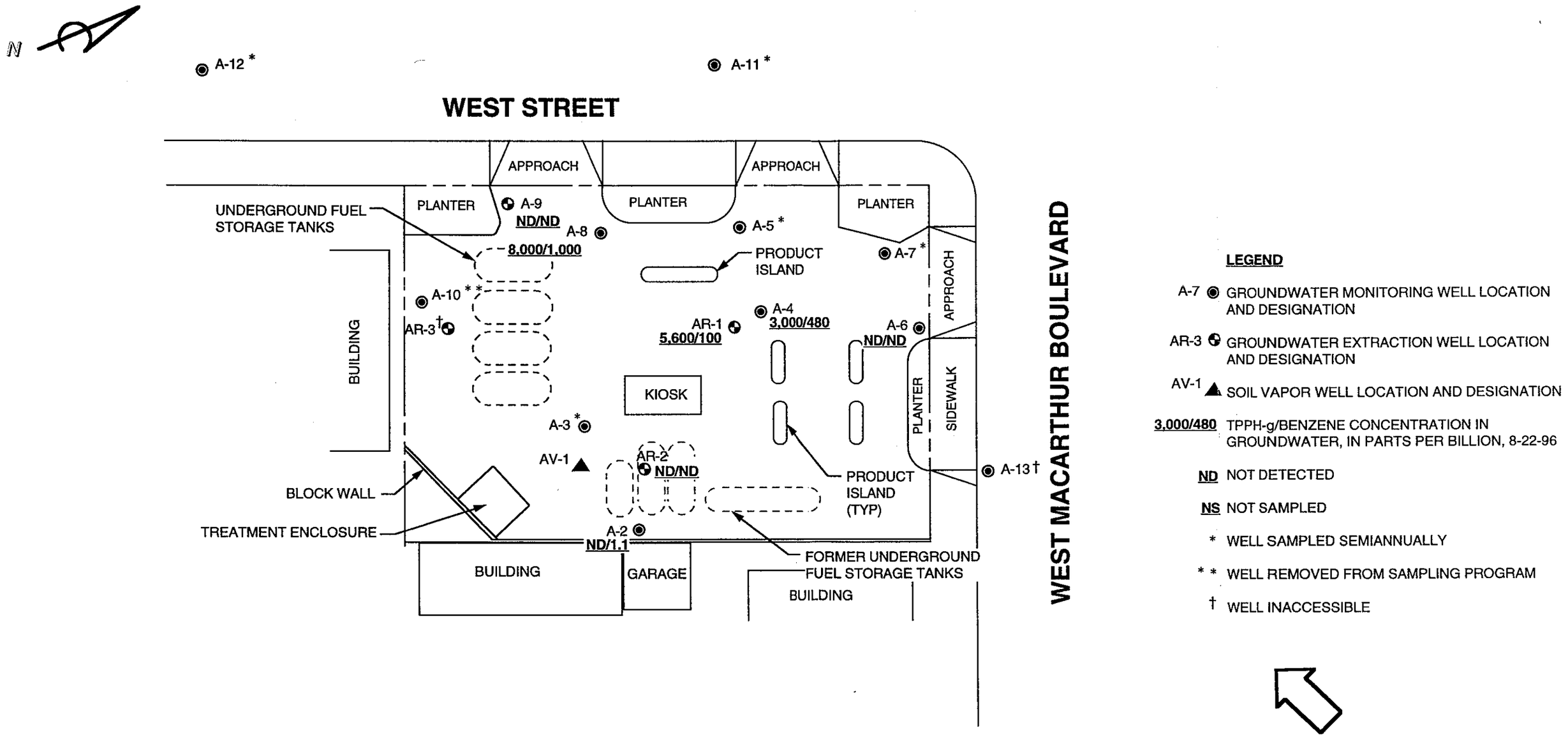
PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE
0 30 60 FEET

ARCO SERVICE STATION 4931
731 West MacArthur Boulevard at West Street
Oakland, California

GROUNDWATER ELEVATION CONTOUR MAP

FIGURE: **1**
PROJECT: 330-109.2C



LEGEND

- A-7 ◉ GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- AR-3 ◉ GROUNDWATER EXTRACTION WELL LOCATION AND DESIGNATION
- AV-1 ▲ SOIL VAPOR WELL LOCATION AND DESIGNATION
- 3,000/480 TPPH-g/BENZENE CONCENTRATION IN GROUNDWATER, IN PARTS PER BILLION, 8-22-96
- ND NOT DETECTED
- NS NOT SAMPLED
- * WELL SAMPLED SEMIANNUALLY
- * * WELL REMOVED FROM SAMPLING PROGRAM
- † WELL INACCESSIBLE

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

SOURCE: MAP FROM GEO STRATEGIES INC. DATED 6-94

PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE
0 30 60 FEET

ARCO SERVICE STATION 4931
731 West MacArthur Boulevard at West Street
Oakland, California

TPPH-g/BENZENE CONCENTRATION MAP

FIGURE: **2**
PROJECT: 330-109.2C

Table 1
Groundwater Sampling Schedule

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Sampling Frequency
A-1	---------- Well Destroyed ----------				
A-2	a	a	a	a	Quarterly
A-3		a		a	Semiannually
A-4	a	a	a	a	Quarterly
A-5		a		a	Semiannually
A-6	a	a	a	a	Quarterly
A-7		a			Annually
A-8		a		a	Semiannually
A-9		a		a	Semiannually
A-10	---------- Removed from Sampling Program ----------				
A-11		a		a	Semiannually
A-12		a		a	Semiannually
A-13				a	Annually
AR-1	---------- Removed from Sampling Program ----------				
AR-2	---------- Removed from Sampling Program ----------				
AR-3	---------- Removed from Sampling Program ----------				

a. Groundwater samples analyzed for the presence of TPPH-g, BTEX compounds, and MtBE according to EPA Methods 8015 (modified) and 8020.

Table 2
Groundwater Elevation and Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, and MtBE)

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	MtBE (ppb)
A-2	03/26/96	55.48	5.37	50.11	<50	<0.50	<0.50	<0.50	<0.50	NA
	05/22/96		5.25	50.23	<50	<0.50	<0.50	<0.50	<0.50	NA
	08/22/96		10.45	45.03	<50	1.1	1.8	<0.50	1.3	<2.5
A-3	03/26/96	54.66	7.20	47.46	---------- Well Sampled Semiannually ----------					
	05/22/96		7.70	46.96	<50	1.2	1.9	0.70	1.3	NA
	08/22/96		10.88	43.78	---------- Well Sampled Semiannually ----------					
A-4	03/26/96	54.73	7.95	46.78	8,900	1,200	21	200	220	NA
	05/22/96		8.35	46.38	5,300	700	<10	170	130	NA
	08/22/96		11.03	43.70	3,000	480	<5.0	75	26	150
A-5	03/26/96	54.17	7.93	46.24	---------- Well Sampled Semiannually ----------					
	05/22/96		8.20	45.97	<50	<0.50	<0.50	<0.50	<0.50	NA
	08/22/96		10.70	43.47	---------- Well Sampled Semiannually ----------					
A-6	03/26/96	55.17	7.15	48.02	52	2.7	<0.50	1.1	2.0	NA
	05/22/96		7.35	47.82	<50	2.4	<0.50	0.88	1.7	NA
	08/22/96		10.12	45.05	<50	<0.50	<0.50	<0.50	<0.50	<2.5
A-7	03/26/96	54.71	6.90	47.81	---------- Well Sampled Semiannually ----------					
	05/22/96		8.27	46.44	<50	<0.50	<0.50	<0.50	<0.50	NA
	08/22/96		9.80	44.91	---------- Well Sampled Semiannually ----------					
A-8††	03/26/96	53.77	7.10	46.67	48,000	2,600	<100	650	1,100	NA
	05/22/96		7.20	46.57	14,000	2,800	160	320	190	NA
	08/22/96		11.57	42.20	8,000	1,000	76	150	96	4,300
A-9†	03/26/96	53.04	7.05	45.99	<50	<0.50	<0.50	<0.50	<0.50	NA
	05/22/96		7.20	45.84	<50	<0.50	<0.50	<0.50	<0.50	NA
	08/22/96		9.68	43.36	<50	<0.50	<0.50	<0.50	<0.50	8.5
A-10	03/26/96	54.26	8.28	45.98	-------- Well Removed from Sampling Program --------					
	05/22/96		8.60	45.66	-------- Well Removed from Sampling Program --------					
	08/22/96		10.98	43.28	-------- Well Removed from Sampling Program --------					
A-11	03/26/96	53.74	8.10	45.64	---------- Well Sampled Semiannually ----------					
	05/22/96		8.25	45.49	<50	<0.50	<0.50	<0.50	<0.50	NA
	08/22/96		10.58	43.16	---------- Well Sampled Semiannually ----------					
A-12	03/26/96	52.05	7.83	44.22	---------- Well Sampled Semiannually ----------					
	05/22/96		7.80	44.25	<50	<0.50	<0.50	<0.50	<0.50	NA
	08/22/96		9.97	42.08	---------- Well Sampled Semiannually ----------					
A-13	03/26/96	55.11	---------- Well Inaccessible ----------							
	05/22/96		---------- Well Inaccessible ----------							
	08/22/96		---------- Well Sampled Annually ----------							
AR-1	03/26/96	54.72	8.13	46.59	6,200	110	64	38	520	NA
	05/22/96		8.57	46.15	NS	NS	NS	NS	NS	NS
	08/22/96		10.97	43.75	5,600	100	28	29	310	960
AR-2	03/26/96	54.77	4.93	49.84	<50	<0.50	<0.50	<0.50	<0.50	NA
	05/22/96		5.65	49.12	NS	NS	NS	NS	NS	NS
	08/22/96		7.27	47.50	<50	<0.50	<0.50	<0.50	<0.50	200

Table 2 (continued)
Groundwater Elevation and Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, and MtBE)

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Gauged/ Sampled	Well Elevation (feet, MSL)	Depth to Water (feet, TOB)	Groundwater Elevation (feet, MSL)	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	MtBE (ppb)
AR-3	03/26/96	54.19	7.95	46.24	<50	<0.50	<0.50	<0.50	<0.50	NA
	05/22/96		8.30	45.89	NS	NS	NS	NS	NS	NS
	08/22/96		10.84	43.35	------- Well Removed from Sampling Program -------					

MSL = Mean sea level
TOB = Top of box
ppb = Parts per billion
< = Denotes laboratory detection limit
NS = Not sampled
† = Bioremediation enhancement at this well has been in progress since 11/17/95.
†† = Bioremediation enhancement at this well has been in progress since 5/22/96.

ATTACHMENT A

HISTORICAL LIQUID SURFACE ELEVATION AND GROUNDWATER ANALYTICAL DATA TABLES

Table A-1
Historical Liquid Surface Elevation Data

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Liquid (feet, TOB)	Depth to Water (feet, TOB)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)
A-2	03/20/89	55.38	3.45	3.45	0.00	51.93
	05/24/89		6.80	6.80	0.00	48.58
	08/18/89		10.82	10.82	0.00	44.56
	10/27/89		8.25	8.25	0.00	47.13
	01/15/90		4.87	4.87	0.00	50.51
	04/04/90		7.03	7.03	0.00	48.35
	07/30/90		10.01	10.01	0.00	45.37
	10/29/90		11.60	11.60	0.00	43.78
	01/16/91		9.43	9.43	0.00	45.95
	04/12/91		3.65	3.65	0.00	51.73
	07/10/91		9.57	9.57	0.00	45.81
	10/21/91		11.54	11.54	0.00	43.84
	02/01/92		11.20	11.20	0.00	44.18
	04/29/92		7.18	7.18	0.00	48.20
	07/29/92	55.48	11.81	11.81	0.00	43.67
	10/29/92		11.91	11.91	0.00	43.57
	01/26/93		5.06	5.06	0.00	50.42
	04/01/93		5.15	5.15	0.00	50.33
	08/06/93		15.33	15.33	0.00	40.15
	10/14/93		15.74	15.74	0.00	39.74
	11/16/93		14.61	14.61	0.00	40.87
	12/16/93		5.80	5.80	0.00	49.68
	02/10/94		4.88	4.88	0.00	50.60
	03/21/94		4.94	4.94	0.00	50.54
	05/06/94		Well Inaccessible			
	08/09/94		12.51	12.51	0.00	42.97
	11/17/94		5.24	5.24	0.00	50.24
	02/09/95		6.55	6.55	0.00	48.93
	05/08/95		6.08	6.08	0.00	49.40
	08/08/95		11.50	11.50	0.00	43.98
	11/03/95		10.92	10.92	0.00	44.56
A-3	03/20/89	54.48	7.51	7.51	0.00	46.97
	05/24/89		10.29	10.29	0.00	44.19
	08/18/89		11.60	11.60	0.00	42.88
	10/27/89		10.16	10.16	0.00	44.32
	01/15/90		8.55	8.55	0.00	45.93
	04/04/90		10.66	10.66	0.00	43.82
	07/30/90		11.26	11.26	0.00	43.22
	10/29/90		11.86	11.86	0.00	42.62
	01/16/91		11.46	11.46	0.00	43.02
	04/12/91		9.28	9.28	0.00	45.20
	07/10/91		11.29	11.29	0.00	43.19
	10/21/91		11.51	11.51	0.00	42.97
	02/02/92		Well Inaccessible			
	04/29/92		Well Inaccessible			
	07/29/92	54.66	11.59	11.59	0.00	43.07
	10/28/92		12.00	12.00	0.00	42.66
	01/26/93		9.82	9.82	0.00	44.84
	04/01/93		10.61	10.61	0.00	44.05
	08/06/93		14.90	14.90	0.00	39.76
	10/14/93		15.11	15.11	0.00	39.55
	11/16/93		14.72	14.72	0.00	39.94
	12/16/93		13.37	13.37	0.00	41.29
	02/10/94		9.20	9.20	0.00	45.46
	05/06/94		10.34	10.34	0.00	44.32
	08/09/94		12.09	12.09	0.00	42.57
	11/17/94		5.85	5.85	0.00	48.81
	02/09/95		9.93	9.93	0.00	44.73

Table A-1 (continued)
Historical Liquid Surface Elevation Data

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Liquid (feet, TOB)	Depth to Water (feet, TOB)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)
A-3	05/08/95		11.32	11.32	0.00	43.34
(cont.)	08/08/95		9.80	9.80	0.00	44.86
	11/03/95		10.26	10.26	0.00	44.40
A-4	03/21/86	54.62	NM	NM	3.50	NM
	01/07/88		NM	NM	0.02	NM
	03/20/89		8.13	8.13	0.00	46.49
	05/24/89		11.40	11.40	0.00	43.22
	08/18/89		11.90	11.91	0.01	42.72
	10/27/89		11.36	11.37	0.01	43.26
	01/15/90		9.73	9.74	0.01	44.89
	04/04/90		11.19	11.19	0.00	43.43
	07/30/90		11.70	11.71	0.01	42.92
	10/29/90		12.18	12.21	0.03	42.44
	01/16/91		11.88	11.89	0.01	42.74
	04/12/91		9.54	9.54	0.00	45.08
	07/10/91		11.55	11.55	0.00	43.07
	09/20/91		12.12	12.12	0.00	42.50
	10/21/91		11.73	11.76	0.03	42.89
	02/02/92		11.16	11.18	0.02	43.46
	04/29/92		10.76	10.78	0.02	43.86
	07/29/92	54.73	11.70	11.74	0.04	43.03
	10/28/92		11.90	11.93	0.03	42.83
	01/26/93		10.55	10.59	0.04	44.18
	04/01/93		10.15	10.17	0.02	44.58
	08/06/93		15.09	15.12	0.03	39.64
	10/14/93		15.37	15.37	0.00	39.36
	11/16/93		14.86	14.86	0.00	39.87
	12/16/93		13.41	13.41	0.00	41.32
	02/10/94		9.30	9.30	0.00	45.43
	05/06/94		10.02	10.02	0.00	44.71
	08/09/94		12.28	12.28	0.00	42.45
	11/17/94		9.44	9.44	0.00	45.29
	02/09/95		10.95	10.95	0.00	43.78
	05/08/95		11.29	11.29	0.00	43.44
	08/08/95		9.81	9.81	0.00	44.92
	11/03/95		10.42	10.42	0.00	44.31
A-5	03/20/89	54.15	8.09	8.09	0.00	46.06
	05/24/89		11.13	11.13	0.00	43.02
	08/18/89		11.58	11.58	0.00	42.57
	10/27/89		10.68	10.68	0.00	43.47
	01/15/90		9.24	9.24	0.00	44.91
	04/04/90		10.93	10.93	0.00	43.22
	07/30/90		11.48	11.48	0.00	42.67
	10/29/90		11.77	11.77	0.00	42.38
	01/16/91		11.36	11.36	0.00	42.79
	04/12/91		9.64	9.64	0.00	44.51
	07/10/91		11.30	11.30	0.00	42.85
	10/21/91		11.48	11.48	0.00	42.67
	02/02/92		10.73	10.73	0.00	43.42
	04/29/92		10.58	10.58	0.00	43.57
	07/29/92	54.17	11.46	11.46	0.00	42.71
	10/28/92		11.55	11.55	0.00	42.62
	01/26/93		10.32	10.32	0.00	43.85
	04/01/93		10.36	10.36	0.00	43.81
	08/06/93		14.82	14.82	0.00	39.35
	10/14/93		14.99	14.99	0.00	39.18
	11/16/93		14.47	14.47	0.00	39.70
	12/16/93		12.94	12.94	0.00	41.23
	02/10/94		8.94	8.94	0.00	45.23

Table A-1 (continued)
Historical Liquid Surface Elevation Data

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Liquid (feet, TOB)	Depth to Water (feet, TOB)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)
A-5	05/06/94		10.48	10.48	0.00	43.69
(cont.)	08/09/94		11.86	11.86	0.00	42.31
	11/17/94		9.49	9.49	0.00	44.68
	02/09/95		10.50	10.50	0.00	43.67
	05/08/95		11 15	11.15	0.00	43.02
	08/08/95		9.39	9.39	0.00	44.78
	11/03/95		10.00	10.00	0.00	44.17
A-6	03/20/89	55.13	6.43	6.43	0.00	48.70
	05/24/89		9.43	9.43	0.00	45.70
	08/18/89		10.10	10.10	0.00	45.03
	10/27/89		9.16	9.16	0.00	45.97
	01/15/90		8.02	8.02	0.00	47.11
	04/04/90		9.29	9.29	0.00	45.84
	07/30/90		9.93	9.93	0.00	45.20
	10/29/90		10.42	10.42	0.00	44.71
	01/16/91		10.15	10.15	0.00	44.98
	04/12/91		8.05	8.05	0.00	47.08
	07/10/91		10.03	10.03	0.00	45.10
	10/21/91		10.30	10.30	0.00	44.83
	02/02/92		9.81	9.81	0.00	45.32
	04/29/92		Well Inaccessible			
	07/29/92	55.17	10.40	10.40	0.00	44.77
	10/28/92		10.55	10.55	0.00	44.62
	01/26/93		7.50	7.50	0.00	47.67
	04/01/93		7.59	7.59	0.00	47.58
	08/06/93		12.32	12.32	0.00	42.85
	10/14/93		12.82	12.82	0.00	42.35
	11/16/93		12.34	12.34	0.00	42.83
	12/16/93		10.40	10.40	0.00	44.77
	02/10/94		7.53	7.53	0.00	47.64
	05/06/94		8.71	8.71	0.00	46.46
	08/09/94		10.57	10.57	0.00	44.60
	11/17/94		7.91	7.91	0.00	47.26
	02/09/95		8.13	8.13	0.00	47.04
	05/08/95		8.85	8.85	0.00	46.32
	08/08/95		8.98	8.98	0.00	46.19
	11/03/95		9.64	9.64	0.00	45.53
A-7	03/20/89	54.67	6.29	6.29	0.00	48.38
	05/24/89		9.26	9.26	0.00	45.41
	08/18/89		9.97	9.97	0.00	44.70
	10/27/89		9.02	9.02	0.00	45.65
	01/15/90		7.90	7.90	0.00	46.77
	04/04/90		9.15	9.15	0.00	45.52
	07/30/90		9.80	9.80	0.00	44.87
	10/29/90		10.30	10.30	0.00	44.37
	01/16/91		11.35	11.35	0.00	43.32
	04/12/91		7.90	7.90	0.00	46.77
	07/10/91		9.82	9.82	0.00	44.85
	10/21/91		10.12	10.12	0.00	44.55
	02/02/92		9.28	9.28	0.00	45.39
	04/29/92		8.85	8.85	0.00	45.82
	07/29/92	54.71	10.09	10.09	0.00	44.62
	10/28/92		10.31	10.31	0.00	44.40
	01/26/93		7.33	7.33	0.00	47.38
	04/01/93		7.35	7.35	0.00	47.36
	08/06/93		12.67	12.67	0.00	42.04
	10/14/93		12.52	12.52	0.00	42.19
	11/16/93		12.13	12.13	0.00	42.58
	12/16/93		10.18	10.18	0.00	44.53

Table A-1 (continued)
Historical Liquid Surface Elevation Data

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Liquid (feet, TOB)	Depth to Water (feet, TOB)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)
A-7	02/10/94		7.40	7.40	0.00	47.31
(cont.)	05/06/94		8.41	8.41	0.00	46.30
	08/09/94		10.57	10.57	0.00	44.14
	11/17/94		7.91	7.91	0.00	46.80
	02/09/95		7.85	7.85	0.00	46.86
	05/08/95		8.36	8.36	0.00	46.35
	08/08/95		8.66	8.66	0.00	46.05
	11/03/95		9.25	9.25	0.00	45.46
A-8	03/21/86	53.61	---------- Well Inaccessible ----------			
	01/07/88		---------- Well Inaccessible ----------			
	03/20/89		7.55	8.21	0.66	46.06
	05/24/89		10.21	11.41	1.20	43.40
	08/18/89		10.11	10.88	0.77	43.50
	10/27/89		10.35	11.66	1.31	43.26
	01/15/90		8.97	9.84	0.87	44.64
	04/04/90		11.10	11.35	0.25	42.51
	07/30/90		8.73	10.48	1.75	44.88
	10/29/90		11.29	11.39	0.10	42.32
	01/16/91		11.10	11.11	0.01	42.51
	04/12/91		9.15	9.16	0.01	44.46
	07/10/91		10.72	10.73	0.01	42.89
	10/21/91		10.87	10.98	0.11	42.74
	02/02/92		9.40	10.80	1.40	44.21
	04/29/92		9.85	11.15	1.30	43.76
	07/29/92	53.77	11.27	11.33	0.06	42.50
	10/28/92		---------- Well Dry ----------			
	01/26/93		---------- Well Dry ----------			
	04/01/93		9.38	9.38	0.00	44.39
	08/06/93		---------- Well Dry ----------			
	10/14/93		13.10	13.10	0.00	40.67
	11/16/93		---------- Well Dry ----------			
	12/16/93		13.40	13.40	0.00	40.37
	02/10/94		8.93	8.94	0.01	44.84
	05/06/94		8.38	8.80	0.42	45.39
	08/09/94		10.13	10.46	0.33	43.64
	11/17/94		9.09	9.41	0.32	44.68
	02/09/95		9.07	9.07	0.00	44.70
	05/08/95		10.60	10.60	<0.01	43.17
	08/08/95		8.87	8.87	0.00	44.90
	11/03/95		9.59	9.60	0.01	44.18
A-9	03/20/89	52.96	6.28	6.28	0.00	46.68
	05/24/89		10.12	10.12	0.00	42.84
	08/18/89		9.51	9.51	0.00	43.45
	10/27/89		8.56	8.56	0.00	44.40
	01/15/90		7.20	7.20	0.00	45.76
	04/04/90		8.78	8.78	0.00	44.18
	07/30/90		10.16	10.16	0.00	42.80
	10/29/90		10.71	10.71	0.00	42.25
	01/16/91		10.44	10.44	0.00	42.52
	04/12/91		8.69	8.69	0.00	44.27
	07/10/91		10.23	10.23	0.00	42.73
	09/20/91		10.47	10.47	0.00	42.49
	10/21/91		10.39	10.39	0.00	42.57
	02/02/92		9.05	9.05	0.00	43.91
	04/29/92		9.56	9.56	0.00	43.40
	07/29/92	53.04	10.43	10.43	0.00	42.61
	10/28/92		---------- Well Inaccessible ----------			
	01/26/93		---------- Well Inaccessible ----------			
	04/01/93		---------- Well Inaccessible ----------			

Table A-1 (continued)
Historical Liquid Surface Elevation Data

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Liquid (feet, TOB)	Depth to Water (feet, TOB)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)
A-9	08/06/93		Well Inaccessible			
(cont.)	10/14/93		Well Inaccessible			
	11/16/93		Well Inaccessible			
	12/16/93		12.10	12.10	0.00	40.94
	02/10/94		6.00	6.00	0.00	45.04
	03/21/94		9.62	9.62	0.00	43.42
	05/06/94		9.41	9.41	0.00	43.63
	08/09/94		10.81	10.81	0.00	42.23
	11/17/94		9.89	9.89	0.00	43.15
	02/09/95		9.97	9.97	0.00	43.07
	05/08/95		10.28	10.28	0.00	42.76
	08/08/95		8.33	8.33	0.00	44.71
	11/03/95		9.00	9.00	0.00	44.04
A-10	03/20/89	54.16	8.52	8.52	0.00	45.64
	05/24/89		11.31	11.31	0.00	42.85
	08/18/89		11.82	11.82	0.00	42.34
	10/27/89		10.94	10.94	0.00	43.22
	01/15/90		9.58	9.58	0.00	44.58
	04/04/90		Well Inaccessible			
	07/30/90		11.57	11.57	0.00	42.59
	10/29/90		12.11	12.11	0.00	42.05
	01/16/91		11.60	11.60	0.00	42.56
	04/12/91		10.04	10.04	0.00	44.12
	07/10/91		11.55	11.55	0.00	42.61
	10/21/91		11.79	11.79	0.00	42.37
	02/02/92		Well Inaccessible			
	04/29/92		10.85	10.85	0.00	43.31
	07/29/92	54.26	11.84	11.84	0.00	42.42
	10/28/92		11.89	11.89	0.00	42.37
	01/26/93		10.81	10.81	0.00	43.45
	04/01/93		10.85	10.85	0.00	43.41
	08/06/93		15.06	15.06	0.00	39.20
	10/14/93		15.22	15.22	0.00	39.04
	11/16/93		14.70	14.70	0.00	39.56
	12/16/93		13.22	13.22	0.00	41.04
	02/10/94		9.61	9.61	0.00	44.65
	05/06/94		10.81	10.81	0.00	43.45
	08/09/94		12.24	12.24	0.00	42.02
	11/17/94		9.89	9.89	0.00	44.37
	02/09/95		11.00	11.00	0.00	43.26
	05/08/95		11.60	11.60	0.00	42.66
	08/08/95		9.65	9.65	0.00	44.61
	11/03/95		10.28	10.28	0.00	43.98
A-11	03/20/89	53.75	8.11	8.11	0.00	45.64
	05/24/89		10.92	10.92	0.00	42.83
	08/18/89		11.52	11.52	0.00	42.23
	10/27/89		10.63	10.63	0.00	43.12
	01/15/90		9.22	9.22	0.00	44.53
	04/04/90		10.85	10.85	0.00	42.90
	07/30/90		11.29	11.29	0.00	42.46
	10/29/90		11.66	11.66	0.00	42.09
	01/16/91		11.31	11.31	0.00	42.44
	04/12/91		9.55	9.55	0.00	44.20
	07/10/91		11.18	11.18	0.00	42.57
	10/21/91		11.24	11.24	0.00	42.51
	02/02/92		10.70	10.70	0.00	43.05
	04/29/92		10.57	10.57	0.00	43.18
	07/29/92	53.74	11.33	11.33	0.00	42.41
	10/28/92		11.54	11.54	0.00	42.20

Table A-1 (continued)
Historical Liquid Surface Elevation Data

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Liquid (feet, TOB)	Depth to Water (feet, TOB)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)
A-11	01/26/93		9.90	9.90	0.00	43.84
(cont.)	04/01/93		10.11	10.11	0.00	43.63
	08/06/93		14.43	14.43	0.00	39.31
	10/14/93		14 72	14.72	0.00	39.02
	11/16/93		NM	NM	NM	NM
	12/16/93		NM	NM	NM	NM
	02/10/94		9.30	9.30	0.00	44.44
	05/06/94		9.94	9.94	0.00	43.80
	08/09/94		11.67	11.67	0.00	42.07
	11/17/94		9.32	9.32	0.00	44.42
	02/09/95		10.20	10.20	0.00	43.54
	05/08/95		10.88	10.88	0.00	42.86
	08/08/95		9.37	9.37	0.00	44.37
	11/03/95		10.10	10.10	0.00	43.64
A-12	03/20/89	52.05	8.00	8.00	0.00	44.05
	05/24/89		10 35	10.35	0.00	41.70
	08/18/89		10.75	10.75	0.00	41.30
	10/27/89		10.06	10.06	0.00	41.99
	01/15/90		8.88	8.88	0.00	43.17
	04/04/90		10.30	10.30	0.00	41.75
	07/30/90		10.66	10.66	0.00	41.39
	10/29/90		10.90	10.90	0.00	41.15
	01/16/91		10.60	10.60	0.00	41.45
	04/12/91		9.45	9.45	0.00	42.60
	07/10/91		10.56	10.56	0.00	41.49
	10/21/91		10.62	10.62	0.00	41.43
	02/02/92		10.10	10.10	0.00	41.95
	04/29/92		10.19	10.19	0.00	41.86
	07/29/92		10.81	10.81	0.00	41.24
	10/28/92		10.81	10.81	0.00	41.24
	01/26/93		9.48	9.48	0.00	42.57
	04/01/93		10.67	10.67	0.00	41.38
	08/06/93		12.95	12.95	0.00	39.10
	10/14/93		13.28	13.28	0.00	38.77
	11/16/93		NM	NM	NM	NM
	12/16/93		NM	NM	NM	NM
	02/10/94		8.66	8.66	0.00	43.39
	05/06/94		9.89	9.89	0.00	42.16
	08/09/94		11.07	11.07	0.00	40.98
	11/17/94		9.17	9.17	0.00	42.88
	02/09/95		9.90	9.90	0.00	42.15
	05/08/95		10.27	10.27	0.00	41.78
	08/08/95		8.47	8.47	0.00	43.58
	11/03/95		9.10	9.10	0.00	42.95
A-13	07/01/92	55.11	9.93	9.93	0.00	45.18
	07/29/92		11.12	11.12	0.00	43.99
	10/28/92		10.84	10.84	0.00	44.27
	01/26/93		8.99	8.99	0.00	46.12
	04/01/93		9.18	9.18	0.00	45.93
	08/06/93		13.70	13.70	0.00	41.41
	10/14/93		14.02	14.02	0.00	41.09
	11/16/93		NM	NM	NM	NM
	12/16/93		NM	NM	NM	NM
	02/10/94		9.64	9.64	0.00	45.47
	05/06/94		10.29	10.29	0.00	44.82
	08/09/94		11.45	11.45	0.00	43.66
	11/17/94		9.67	9.67	0.00	45.44
	02/09/95		9.38	9.38	0.00	45.73
	05/08/95		10.32	10.32	0.00	44.79

Table A-1 (continued)
Historical Liquid Surface Elevation Data

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Liquid (feet, TOB)	Depth to Water (feet, TOB)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)
A-13	08/08/95		----------	Well Inaccessible	----------	
(cont.)	11/03/95		----------	Well Inaccessible	----------	
AR-1	07/01/92	54.72	10.27	10.27	0.00	44.45
	07/29/92		11.32	11.32	0.00	43.40
	10/28/92		----------	Well Inaccessible	----------	
	01/26/93		----------	Well Inaccessible	----------	
	04/01/93		----------	Well Inaccessible	----------	
	08/06/93		17.42	17.42	0.00	37.30
	10/14/93		----------	Well Inaccessible	----------	
	11/16/93		13.76	13.76	0.00	40.96
	12/16/93		19.44	19.44	0.00	35.28
	02/10/94		9.00	9.00	0.00	45.72
	03/21/94		9.99	10.00	0.01	44.73
	05/06/94		19.61	19.61	0.00	35.11
	08/09/94		17.51	17.59	0.08	37.21
	11/17/94		17.39	17.39	sheen	37.33
	02/09/95		18.83	18.83	0.00	35.89
	05/08/95		10.96	10.96	0.00	43.76
	08/08/95		9.70	9.70	0.00	45.02
	11/03/95		10.32	10.32	0.00	44.40
AR-2	07/01/92	54.77	11.33	11.33	0.00	43.44
	07/29/92		11.90	11.90	0.00	42.87
	10/28/92		----------	Well Inaccessible	----------	
	01/26/93		----------	Well Inaccessible	----------	
	04/01/93		----------	Well Inaccessible	----------	
	08/06/93		17.16	17.16	0.00	37.61
	10/14/93		18.11	18.11	0.00	36.66
	11/16/93		17.92	17.92	0.00	36.85
	12/16/93		18.02	18.02	0.00	36.75
	02/10/94		9.32	9.32	0.00	45.45
	03/21/94		10.36	10.36	0.00	44.41
	05/06/94		15.14	15.14	0.00	39.63
	08/09/94		18.25	18.25	0.00	36.52
	11/17/94		18.10	18.10	0.00	36.67
	02/09/95		17.10	17.10	0.00	37.67
	05/08/95		18.25	18.25	0.00	36.52
	08/08/95		10.20	10.20	0.00	44.57
	11/03/95		10.27	10.27	0.00	44.50
AR-3	07/01/92	54.19	10.11	10.11	0.00	44.08
	07/29/92		11.55	11.55	0.00	42.64
	10/28/92		----------	Well Inaccessible	----------	
	01/26/93		----------	Well Inaccessible	----------	
	04/01/93		----------	Well Inaccessible	----------	
	08/06/93		16.12	16.12	0.00	38.07
	10/14/93		----------	Well Inaccessible	----------	
	11/16/93		16.38	16.38	0.00	37.81
	12/16/93		----------	Well Inaccessible	----------	
	02/10/94		9.20	9.20	0.00	44.99
	03/21/94		10.80	10.80	0.00	43.39
	05/06/94		10.54	10.54	0.00	43.65
	08/09/94		11.92	11.92	0.00	42.27
	11/17/94		9.62	9.62	0.00	44.57
	02/09/95		15.90	15.90	0.00	38.29
	05/08/95		17.75	17.75	0.00	36.44
	08/08/95		9.47	9.47	0.00	44.72
	11/03/95		10.05	10.05	0.00	44.14

MSL = Mean sea level
TOB = Top of box
NM = Not measured

Table A-2
Historical Groundwater Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline and BTEX Compounds)

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Sampled	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
A-2	03/21/86	31,000	NA	NA	NA	NA
	01/07/88	12,000	920	1,500	--	4,000
	03/20/89	22,000	1,200	1,800	1,200	7,700
	05/24/89	9,000	460	260	250	2,400
	08/18/89	14,000	900	200	<200	1,300
	10/27/89	16,000	1,200	340	90	3,100
	01/15/90	9,900	1,100	460	150	2,900
	04/04/90	16,000	1,100	400	380	3,900
	07/30/90	16,000	1,400	340	290	3,600
	07/30/90	16,000	1,400	340	290	3,600
	10/29/90	14,000	1,100	210	66	2,700
	01/16/91	15,000	1,200	800	190	4,600
	04/12/91	16,000	640	290	280	2,600
	10/21/91	26,000	1,100	560	81	3,900
	02/02/92	11,000	150	13	91	94
	04/29/92	5,400	120	16	129	19
	07/30/92	590	10	<2.0	<2.0	9
	10/29/92	77	0.56	<0.50	<0.50	0.51
	01/26/93	390	0.87	<0.50	<0.50	4.3
	04/01/93	16,000	<10	<10	<10	<10
	08/06/93	Well Dry				
	10/14/93	350	<0.5	<0.5	<0.5	<0.5
	02/10/94	Well Dry				
	03/21/94	66	<0.5	<0.5	<0.5	<0.5
	05/06/94	Well Inaccessible				
	08/09/94	<50	1.1	<0.5	<0.5	<0.5
	11/17/94	<50	<0.5	<0.5	<0.5	<0.5
	02/09/95	50	1.7	2.0	<0.5	1.6
	05/08/95	<50	1.4	1.4	<0.50	0.50
	08/08/95	<50	<0.50	<0.50	<0.50	<0.50
	11/03/95	<50	<0.50	<0.50	<0.50	<0.50
A-3	03/21/86	1,000	NA	NA	NA	NA
	01/07/88	250	2.3	8	NA	21
	03/20/89	230	1.6	<1	3	3
	05/24/89	170	0.9	2	1	<3
	08/18/89	180	0.7	1	<1	<3
	10/27/89	120	<0.5	<0.5	<0.5	<1
	01/15/90	<50	<0.5	<0.5	<0.5	<1
	04/04/90	88	1.2	2.0	0.8	4
	07/30/90	120	8.3	2.9	2.3	12
	10/29/90	780	10	27	18	85
	01/16/91	69	2.0	3.5	<0.5	9.6
	04/12/91	<30	<0.30	<0.30	<0.30	<0.30
	07/10/91	59	<0.30	<0.30	0.50	0.51
	10/21/91	56	0.44	0.77	0.41	1.3
	02/01/92	Well Inaccessible				
	04/29/92	Well Inaccessible				
	07/30/92	<50	<0.50	<0.50	<0.50	<0.50
	10/28/92	<50	<0.50	<0.50	<0.50	<0.50
	01/26/93	<50	<0.50	<0.50	<0.50	<0.50
	04/01/93	<50	<0.50	<0.50	<0.50	<0.50
	08/06/93	<50	<0.5	<0.5	<0.5	<0.5
	10/14/93	<50	<0.5	<0.5	<0.5	<0.5
	02/10/94	<50	<0.5	<0.5	<0.5	<0.5
	05/06/94	<50	<0.5	<0.5	<0.5	<0.5
	08/09/94	<50	<0.5	<0.5	<0.5	<0.5

Table A-2 (continued)
Historical Groundwater Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline and BTEX Compounds)

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Sampled	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
A-3	11/17/94	<50	<0.5	<0.5	<0.5	<0.5
(cont.)	02/09/95	90	0.9	<0.5	0.7	1.3
	05/08/95	<50	<0.50	<0.50	<0.50	<0.50
	08/08/95	NS	NS	NS	NS	NS
	11/03/95	<50	<0.50	<0.50	<0.50	<0.50
A-4	03/21/86	---------- 3.50 feet of Separate-Phase Hydrocarbons ----------				
	01/07/88	---------- 0.02 foot of Separate-Phase Hydrocarbons ----------				
	03/20/89	360,000	1,500	3,700	6,500	35,000
	05/24/89	1,500,000	1,000	2,000	6,000	23,000
	08/18/89	---------- 0.01 foot of Separate-Phase Hydrocarbons ----------				
	10/27/89	---------- 0.01 foot of Separate-Phase Hydrocarbons ----------				
	01/15/90	---------- 0.01 foot of Separate-Phase Hydrocarbons ----------				
	04/04/90	40,000	680	320	1,400	4,900
	07/30/90	---------- 0.01 foot of Separate-Phase Hydrocarbons ----------				
	10/29/90	---------- 0.03 foot of Separate-Phase Hydrocarbons ----------				
	01/16/91	---------- 0.01 foot of Separate-Phase Hydrocarbons ----------				
	04/12/91	1,800	<60	90	650	1,700
	07/10/91	61,000	2,700	8,500	1,700	8,200
	09/20/91	NA	1,200	5,300	1,500	11,000
	02/01/92	---------- 0.02 foot of Separate-Phase Hydrocarbons ----------				
	04/29/92	---------- 0.02 foot of Separate-Phase Hydrocarbons ----------				
	07/29/92	---------- 0.04 foot of Separate-Phase Hydrocarbons ----------				
	10/28/92	---------- 0.03 foot of Separate-Phase Hydrocarbons ----------				
	01/26/93	---------- 0.04 foot of Separate-Phase Hydrocarbons ----------				
	04/01/93	---------- 0.02 foot of Separate-Phase Hydrocarbons ----------				
	08/06/93	---------- 0.03 foot of Separate-Phase Hydrocarbons ----------				
	10/14/93	160,000	1,200	<250	4,100	950
	02/10/94	56,000	220	68	790	700
	05/06/94	18,000	210	<30	200	101
	08/09/94	20,000	800	<20	200	270
	11/17/94	3,900	420	11	38	92
	02/09/95	14,000	2,900	7.5	420	440
	05/08/95	5,100	700	<10 b	79	160
	08/08/95	4,200	240	17	88	110
	11/03/95	1,200	22	<0.50	6.4	3.7
A-5	03/21/86	88	NA	NA	NA	NA
	01/07/88	<50	0.5	1	NA	4
	03/20/89	60	0.5	1	2	10
	05/24/89	<50	0.5	<1	<1	<3
	08/18/89	<50	<0.5	<1	<1	<3
	10/27/89	<50	<0.50	<0.50	<0.50	<1
	01/15/90	<50	<0.5	<0.5	<0.5	<1
	04/04/90	<50	<0.5	<0.5	<0.5	<1
	07/30/90	<50	<0.5	<0.5	<0.5	<0.5
	10/29/90	280	<0.5	<0.5	<0.5	<0.5
	01/16/91	<50	<0.5	<0.5	<0.5	<0.5
	04/12/91	<30	<0.30	<0.30	<0.30	0.84
	07/10/91	<30	<0.30	<0.30	<0.30	<0.30
	10/21/91	<30	<0.30	<0.30	<0.30	<0.30
	02/01/92	<30	1.7	<0.30	<0.30	<0.30
	04/29/92	<30	<0.30	<0.30	<0.30	<0.30
	07/30/92	<50	<0.50	<0.50	<0.50	<0.50
	10/28/92	<50	<0.50	<0.50	<0.50	<0.50
	01/26/93	<50	<0.50	<0.50	<0.50	<0.50
	04/01/93	<50	<0.50	<0.50	<0.50	<0.50
	08/06/93	<50	<0.5	<0.5	<0.5	<0.5
	10/14/93	<50	<0.5	<0.5	<0.5	<0.5

Table A-2 (continued)
Historical Groundwater Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline and BTEX Compounds)

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Sampled	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
A-5	02/10/94	<50	<0.5	<0.5	<0.5	<0.5
(cont.)	05/06/94	<50	<0.5	<0.5	<0.5	<0.5
	08/09/94	<50	<0.5	<0.5	<0.5	<0.5
	11/17/94	<50	<0.5	<0.5	<0.5	<0.5
	02/09/95	<50	<0.5	<0.5	<0.5	<0.5
	05/08/95	<50	<0.50	<0.50	<0.50	<0.50
	08/08/95	NS	NS	NS	NS	NS
	11/03/95	<50	<0.50	<0.50	<0.50	<0.50
A-6	03/21/86	<10	NA	NA	NA	NA
	01/07/88	390	54	89	NA	110
	03/20/89	220	33	21	9	39
	05/24/89	110	13	6	3	13
	08/18/89	<50	2.1	1	<1	<3
	10/27/89	55	3.8	1.6	1.7	6
	01/15/90	100	12	2.5	5.5	18
	04/04/90	100	17	7.1	5.5	18
	07/30/90	<50	2.6	<0.5	<0.5	1.2
	10/29/90	<50	0.7	<0.5	<0.5	<0.5
	01/16/91	<50	<0.5	<0.5	<0.5	<0.5
	04/12/91	430	24	5.1	9.4	32
	07/10/91	<30	1.4	0.39	0.47	1.5
	10/21/91	<30	<0.30	<0.30	<0.30	<0.30
	02/01/92	<30	2.0	0.40	0.58	1.7
	04/29/92	Well Inaccessible				
	07/30/92	<50	0.64	<0.50	<0.50	<0.50
	10/28/92	<50	<0.50	<0.50	<0.50	<0.50
	01/26/93	1,600	4.8	1.2	14	46
	04/01/93	310	4.8	0.74	3.3	8.7
	08/06/93	<50	<0.5	<0.5	<0.5	<0.5
	10/14/93	<50	<0.5	<0.5	<0.5	<0.5
	02/10/94	140	2.8	<0.5	2.4	5.6
	05/06/94	61	1.7	<0.5	0.6	1.4
	08/09/94	<50	<0.5	<0.5	<0.5	<0.5
	11/17/94	53	<0.5	<0.5	<0.5	<0.5
	02/09/95	90	17	0.8	1.2	6.0
	05/08/95	100	7.9	<0.50	4.1	8.6
	08/08/95	<50	<0.50	<0.50	<0.50	<0.50
	11/03/95	<50	<0.50	<0.50	<0.50	<0.50
A-7	01/07/88	<50	<0.5	1	NA	4
	03/20/89	<50	0.9	<1	<1	<3
	05/24/89	<50	<0.5	<1	<1	<3
	08/18/89	<50	<0.5	<1	<1	<3
	10/27/89	<50	<0.5	<0.5	<0.5	<1
	01/15/90	<50	<0.5	<0.5	<0.5	<1
	04/04/90	<50	<0.5	<0.5	<0.5	<1
	07/30/90	<50	<0.5	<0.5	<0.5	<0.5
	10/29/90	<50	2.7	7.6	1.1	3.0
	01/16/91	<50	<0.5	<0.5	<0.5	<0.5
	04/12/91	<30	<0.30	<0.30	<0.30	0.48
	07/10/91	<30	<0.30	0.49	<0.30	1.2
	10/21/91	<30	<0.30	<0.30	<0.30	<0.30
	02/01/92	<30	<0.30	<0.30	<0.30	<0.30
	04/29/92	<30	<0.30	<0.30	<0.30	<0.30
	07/29/92	<50	<0.50	<0.50	<0.50	<0.50
	10/28/92	<50	<0.50	<0.50	<0.50	<0.50
	01/26/93	<50	<0.50	<0.50	<0.50	<0.50
	04/01/93	<50	<0.50	<0.50	<0.50	<0.50

Table A-2 (continued)
Historical Groundwater Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline and BTEX Compounds)

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Sampled	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
A-7 (cont.)	08/06/93	<50	<0.5	<0.5	<0.5	<0.5
	10/14/93	<50	<0.5	<0.5	<0.5	<0.5
	02/10/94	<50	<0.5	<0.5	<0.5	<0.5
	05/06/94	<50	<0.5	<0.5	<0.5	<0.5
	08/09/94	<50	<0.5	<0.5	<0.5	<0.5
	11/17/94	<50	<0.5	<0.5	<0.5	<0.5
	02/09/95	<50	3.7	<0.5	<0.5	<0.5
	05/08/95	<50	<0.50	<0.50	<0.50	<0.50
	08/08/95	NS	NS	NS	NS	NS
	11/03/95	Well Sampled Annually				
A-8	03/21/86	Well Inaccessible				
	01/07/88	Well Inaccessible				
	03/20/89	0.66 foot of Separate-Phase Hydrocarbons				
	05/24/89	1.20 feet of Separate-Phase Hydrocarbons				
	08/18/89	0.77 foot of Separate-Phase Hydrocarbons				
	10/27/89	1.31 feet of Separate-Phase Hydrocarbons				
	01/15/90	0.87 foot of Separate-Phase Hydrocarbons				
	04/04/90	0.25 foot of Separate-Phase Hydrocarbons				
	07/30/90	1.75 feet of Separate-Phase Hydrocarbons				
	10/29/90	0.10 foot of Separate-Phase Hydrocarbons				
	01/16/91	0.01 foot of Separate-Phase Hydrocarbons				
	04/12/91	0.01 foot of Separate-Phase Hydrocarbons				
	07/10/91	0.01 foot of Separate-Phase Hydrocarbons				
	10/21/91	0.11 foot of Separate-Phase Hydrocarbons				
	02/01/92	1.40 feet of Separate-Phase Hydrocarbons				
	04/29/92	1.30 feet of Separate-Phase Hydrocarbons				
	07/29/92	0.06 foot of Separate-Phase Hydrocarbons				
	10/28/92	Well Dry				
	01/26/93	Well Dry				
	04/01/93	Well Inaccessible				
	08/06/93	Well Dry				
	10/14/93	Well Inaccessible				
	12/10/93	29,000,000	16,000	12,000	19,000	99,000
	02/10/94	NS	NS	NS	NS	NS
	05/06/94	NS	NS	NS	NS	NS
	08/09/94	0.33 foot of Separate-Phase Hydrocarbons				
	11/17/94	0.32 foot of Separate-Phase Hydrocarbons				
	02/09/95	68,000	2,400	500	960	5,000
	05/08/95	23,000	3,600	560	520	2,100
	08/08/95	20,000	2,700	140	730	1,600
	11/03/95	0.01 foot of Separate-Phase Hydrocarbons				
A-9	01/07/88	300	45	14	NA	43
	03/21/89	50	2.8	1	1	3
	05/24/89	120	26	12	4	79
	08/18/89	14,000	400	800	400	2,000
	10/27/89	1,700	150	36	30	110
	01/15/90	860	140	58	38	140
	04/04/90	620	36	13	9.4	32
	07/30/90	180	77	1.6	2.1	4.2
	10/29/90	110	30	3.7	4.1	8.3
	01/16/91	<50	15	<0.5	<0.5	0.6
	04/12/91	130	52	0.83	5.3	6.0
	07/10/91	<30	7.8	<0.30	<0.30	<0.30
	09/20/91	NA	21	<2.0	<2.0	<0.20
	10/21/91	240	63	0.65	5.1	1.6
	02/01/92	320	77	0.95	11	6.5
	04/29/92	170	52	<0.30	5.6	1.4

Table A-2 (continued)
Historical Groundwater Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline and BTEX Compounds)

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Sampled	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
A-9	07/30/92	<50	14	<0.50	1.7	6.0
(cont.)	10/28/92	Well Inaccessible				
	01/26/93	Well Inaccessible				
	04/01/93	Well Inaccessible				
	08/06/93	Well Inaccessible				
	10/14/93	Well Inaccessible				
	12/10/93	<50	<0.5	<0.5	<0.5	<0.5
	02/10/94	Well Inaccessible				
	03/21/94	<50	<0.5	<0.5	<0.5	<0.5
	05/06/94	<50	<0.5	<0.5	<0.5	<0.5
	08/09/94	<50	<0.5	<0.5	<0.5	<0.5
	11/17/94	<50	2.5	<0.5	0.9	3.3
	02/09/95	<50	<0.5	<0.5	<0.5	<0.5
	05/08/95	<50	<0.50	<0.50	<0.50	<0.50
	08/08/95	80	2.6	<0.50	<0.50	<0.50
	11/03/95	NS	NS	NS	NS	NS
A-10	01/07/88	<50	0.6	11	NA	4
	03/20/89	<50	<0.5	<1	<1	<3
	05/24/89	<50	<0.5	<1	<1	<3
	08/18/89	<50	<0.5	<1	<1	<3
	10/27/89	<50	<0.5	<0.5	<0.5	<1
	01/15/90	<50	<0.5	<0.5	<0.5	<1
	04/04/90	Well Inaccessible				
	07/30/90	<50	<0.5	<0.5	<0.5	<0.5
	10/29/90	<50	2.3	6.9	1.2	3.0
	01/16/91	<50	<0.5	<0.5	<0.5	<0.5
	04/12/91	<30	0.67	0.55	<0.30	0.90
	07/10/91	<30	<0.30	<0.30	<0.30	<0.30
	10/21/91	<30	<0.30	<0.30	<0.30	<0.30
	02/02/92	Well Inaccessible				
	04/29/92	<30	<0.30	<0.30	<0.30	<0.30
	07/29/92	<50	25	<0.50	<0.50	1.8
	10/28/92	<50	<0.50	<0.50	<05.0	<0.50
	01/26/93	<50	<0.50	<0.50	<0.50	<0.50
	04/01/93	<50	<0.50	<0.50	<0.50	<0.50
	08/06/93	<50	<0.5	<0.5	<0.5	<0.5
	10/14/93	<50	<0.5	<0.5	<0.5	<0.5
	02/10/94	<50	<0.5	<0.5	<0.5	<0.5
	05/06/94	<50	<0.5	<0.5	<0.5	<0.5
	08/09/94	<50	<0.5	<0.5	<0.5	<0.5
	11/17/94	<50	<0.5	<0.5	<0.5	<0.5
	02/09/95	60	<0.5	<0.5	<0.5	<0.5
	05/08/95	<50	<0.50	<0.50	<0.50	<0.50
	08/08/95	Well Removed from Sampling Program				
A-11	01/07/88	<50	1.1	2	NA	5
	03/20/89	<50	<0.5	<1	<1	<3
	05/24/89	<50	<0.5	<1	<1	<3
	08/18/89	<50	<0.5	<1	<1	<3
	10/27/89	<50	<0.5	<0.5	<0.5	<1
	01/15/90	<50	<0.5	<0.5	<0.5	<1
	04/04/90	<50	<0.5	<0.5	<0.5	<1
	07/30/90	<50	<0.5	0.6	<0.5	0.5
	10/29/90	<50	0.6	2.4	0.6	1.5
	01/16/91	<50	<0.5	<0.5	<0.5	<0.5
	04/12/91	<30	<0.30	0.37	<0.30	<0.30
	07/10/91	<30	0.61	0.46	<0.30	1.0

Table A-2 (continued)
Historical Groundwater Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline and BTEX Compounds)

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Sampled	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
A-11	10/21/91	<30	<0.30	<0.30	<0.30	<0.30
(cont.)	02/01/92	<30	<0.30	<0.30	<0.30	<0.30
	04/29/92	<30	<0.30	<0.30	<0.30	<0.30
	07/30/92	<50	<0.50	<0.50	<0.50	<0.50
	10/28/92	<50	<0.50	<0.50	<0.50	<0.50
	01/26/93	<50	<0.50	<0.50	<0.50	<0.50
	01/04/93	<50	<0.50	<0.50	<0.50	<0.50
	08/06/93	<50	<0.5	<0.5	<0.5	<0.5
	10/14/93	<50	<0.5	<0.5	<0.5	<0.5
	02/10/94	<50	<0.5	<0.5	<0.5	<0.5
	05/06/94	<50	<0.5	<0.5	<0.5	<0.5
	08/09/94	<50	<0.5	<0.5	<0.5	<0.5
	11/17/94	<50	<0.5	<0.5	<0.5	<0.5
	02/09/95	<50	<0.5	<0.5	<0.5	<0.5
	05/08/95	<50	<0.50	<0.50	<0.50	<0.50
	08/08/95	NS	NS	NS	NS	NS
	11/03/95	<50	<0.50	<0.50	<0.50	<0.50
A-12	01/07/88	<50	<0.5	2	NA	<4
	03/20/89	<50	<0.5	<1	<1	<3
	05/24/89	<50	<0.5	<1	<1	<3
	08/18/89	<50	<0.5	<1	<1	<3
	10/27/89	<50	<0.5	<0.5	<0.5	<1
	01/15/90	<50	<0.5	<0.5	<0.5	<1
	04/04/90	<50	<0.5	<0.5	<0.5	<1
	07/30/90	<50	<0.5	<0.5	<0.5	<0.5
	10/29/90	<50	<0.5	<0.5	<0.5	<0.5
	01/16/91	<50	<0.5	<0.5	<0.5	<0.5
	04/12/91	<30	<0.30	<0.30	<0.30	<0.30
	07/10/91	<30	<0.30	<0.30	<0.30	<0.30
	10/21/91	<30	<0.30	<0.30	<0.30	<0.30
	02/01/92	<30	<0.30	<0.30	<0.30	<0.30
	04/29/92	<30	<0.30	<0.30	<0.30	<0.30
	07/30/92	<50	<0.50	<0.50	<0.50	<0.50
	10/28/92	<50	<0.50	<0.50	<0.50	<0.50
	01/26/93	<50	<0.50	<0.50	<0.50	<0.50
	04/01/93	<50	<0.50	<0.50	<0.50	<0.50
	08/06/93	<50	<0.5	<0.5	<0.5	<0.5
	10/14/93	<50	<0.5	<0.5	<0.5	<0.5
	02/10/94	<50	<0.5	<0.5	<0.5	<0.5
	05/06/94	<50	<0.5	<0.5	<0.5	<0.5
	08/09/94	<50	<0.5	<0.5	<0.5	<0.5
	11/17/94	<50	<0.5	<0.5	<0.5	<0.5
	02/09/95	<50	<0.5	<0.5	<0.5	<0.5
	05/08/95	<50	<0.50	<0.50	<0.50	<0.50
	08/08/95	NS	NS	NS	NS	NS
	11/03/95	<50	<0.50	<0.50	<0.50	<0.50
A-13	07/01/92	<50	<0.50	<0.50	<0.50	<0.50
	07/30/92	<50	<0.50	<0.50	<0.50	<0.50
	10/28/92	<50	<0.50	<0.50	<0.50	<0.50
	01/26/93	<50	<0.50	<0.50	<0.50	<0.50
	04/01/93	<50	<0.50	<0.50	<0.50	<0.50
	08/06/93	<50	<0.5	<0.5	<0.5	<0.5
	10/14/93	<50	<0.5	<0.5	<0.5	<0.5
	02/10/94	<50	<0.5	<0.5	<0.5	<0.5
	05/06/94	<50	<0.5	<0.5	<0.5	<0.5
	08/09/94	<50	<0.5	<0.5	<0.5	<0.5
	11/17/94	<50	<0.5	<0.5	<0.5	<0.5

Table A-2 (continued)
Historical Groundwater Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline and BTEX Compounds)

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Sampled	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
A-13	02/09/95	<50	<0.5	<0.5	<0.5	<0.5
(cont.)	05/08/95	<50	<0.50	<0.50	<0.50	<0.50
	08/08/95	Well Inaccessible				
	11/03/95	Well Inaccessible				
AR-1	07/01/92	2,300	260	150	38	470
	07/29/92	1,600	340	180	52	320
	10/28/92	Well Inaccessible				
	01/26/93	Well Inaccessible				
	04/01/93	Well Inaccessible				
	08/06/93	Well Inaccessible				
	10/14/93	Well Inaccessible				
	12/10/93	3,400	<25	<25	<25	250
	02/10/94	Well Inaccessible				
	03/21/94	NS	NS	NS	NS	NS
	05/06/94	NS	NS	NS	NS	NS
	08/09/94	0.08 foot of Separate-Phase Hydrocarbons				
	11/17/94	Sheen of Separate-Phase Hydrocarbons				
	02/09/95	670	1.5	1.0	0.7	33
	05/08/95	3,700	19	<2.5 b	5.7	47
	08/08/95	12,000	560	180	82	1,000
	11/03/95	7,400	130	41	18	370
AR-2	07/01/92	<50	<0.50	<0.50	<0.50	<0.50
	07/29/92	350	130	8.5	<10	<10
	10/28/92	Well Inaccessible				
	01/26/93	Well Inaccessible				
	04/01/93	Well Inaccessible				
	08/06/93	Well Inaccessible				
	10/14/93	Well Inaccessible				
	12/10/93	<50	<0.5	<0.5	<0.5	<0.5
	02/10/94	Well Inaccessible				
	03/21/94	<50	<0.5	<0.5	<0.5	<0.5
	05/06/94	<50	<0.5	<0.5	<0.5	<0.5
	08/09/94	<50	<0.5	<0.5	<0.5	<0.5
	11/17/94	<50	<0.5	<0.5	<0.5	<0.5
	02/09/95	60	<0.5	<0.5	<0.5	<0.5
	05/08/95	<50	<0.50	<0.50	<0.50	<0.50
	08/08/95	<50	<0.50	<0.50	<0.50	<0.50
	11/03/95	<50	<0.50	<0.50	<0.50	<0.50
AR-3	07/01/92	<50	1.8	0.86	<0.50	2.2
	07/29/92	<50	1.6	<0.50	<0.50	<0.50
	10/28/92	Well Inaccessible				
	01/26/93	Well Inaccessible				
	04/01/93	Well Inaccessible				
	08/06/93	Well Inaccessible				
	10/14/93	Well Inaccessible				
	12/10/93	<50	<0.5	<0.50	<0.50	<0.50
	02/10/94	Well Inaccessible				
	03/21/94	<50	<0.5	<0.5	<0.5	<0.5
	05/06/94	<50	<0.5	<0.5	<0.5	<0.5
	08/09/94	<50	<0.5	<0.5	<0.5	<0.5
	11/17/94	<50	<1.3 a	<0.5	<0.5	<0.5
	02/09/95	50	<0.5	<0.5	<0.5	<0.5
	05/08/95	<50	<0.50	<0.50	<0.50	<0.50

Table A-2 (continued)
Historical Groundwater Analytical Data
Total Purgeable Petroleum Hydrocarbons
(TPPH as Gasoline and BTEX Compounds)

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Well Number	Date Sampled	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
AR-3	08/08/95	<50	<0.50	<0.50	<0.50	<0.50
(cont.)	11/03/95	<50	<0.50	<0.50	<0.50	<0.50

ppb = Parts per billion
NA = Not analyzed
NS = Not sampled
a. = Laboratory raised MRL due to matrix interference
b. = Laboratory raised MRL due to high analyte concentration requiring sample dilution.
Prior to June 1995, TPPH as gasoline was reported as TPH as gasoline.

Table A-3
Historical Groundwater Analytical Data
Total Methyl t-Butyl Ether

ARCO Service Station 4931
731 West MacArtur Boulevard at West Street
Oakland, California

Well I.D.	Date Sampled	Methyl t-Butyl Ether (ppb)
A-2	08/08/95	<2.5
	11/03/95	NS
A-3	08/08/95	NS
	11/03/95	<2.5
A-4	08/08/95	210
	11/03/95	NS
A-5	08/08/95	NS
	11/03/95	<2.5
A-6	08/08/95	<2.5
	11/03/95	NS
A-7	08/08/95	NS
	11/03/95	NS
A-8	08/08/95	1,200
	11/03/95	NS
A-9	08/08/95	17
	11/03/95	NS
A-10	08/08/95	NS
	11/03/95	NS
A-11	08/08/95	NS
	11/03/95	<2.5
A-12	08/08/95	NS
	11/03/95	<2.5
A-13	08/08/95	NS
	11/03/95	NS
AR-1	08/08/95	220
	11/03/95	NS
AR-2	08/08/95	<2.5
	11/03/95	NS
AR-3	08/08/95	<2.5
	11/03/95	NS

ppb = Parts per billion
NS = Not sampled

ATTACHMENT B

FIELD AND LABORATORY PROCEDURES

ATTACHMENT B
FIELD AND LABORATORY PROCEDURES

Sampling Procedures

The sampling procedure for each well consists first of measuring the water level and checking for the presence of separate-phase hydrocarbons (SPH), using either an electronic indicator and a clear Teflon® bailer or an oil-water interface probe. Wells not containing SPH are then purged of approximately four casing volumes of water (or to dryness) using a centrifugal pump, gas displacement pump, or bailer. Equipment used for the current sampling event is noted on the attached field data sheets. During purging, temperature, pH, and electrical conductivity are monitored in order to document that these parameters are stable prior to collecting samples. After purging, water levels are allowed to partially recover. Groundwater samples are collected using a Teflon® bailer, placed into appropriate EPA-approved containers, labeled, logged onto chain-of-custody documents, and transported on ice to a California State-certified laboratory.

Laboratory Procedures

The groundwater samples were analyzed for the presence of total purgeable petroleum hydrocarbons calculated as gasoline, benzene, toluene, ethylbenzene, xylenes, and methyl tert-butyl ether. The analyses were performed according to EPA Methods 8015 (modified) and 8020 utilizing a purge-and-trap extraction technique. Final detection was by gas chromatography using flame- and photo-ionization detectors. The methods of analysis for the groundwater samples are documented in the certified analytical report. The certified analytical report, chain-of-custody documentation, and field data sheets are presented as Attachment C.

ATTACHMENT C

CERTIFIED ANALYTICAL REPORT, CHAIN-OF-CUSTODY DOCUMENTATION, AND FIELD DATA SHEETS

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Kelly Brown

Project: 330-109.2I/4931,Oakland

Enclosed are the results from samples received at Sequoia Analytical on August 23, 1996. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE COLLECTED	TEST METHOD
9608F05 -01	LIQUID, A-2	08/22/96	MTBE_W Methyl t-Butyl Ethe
9608F05 -01	LIQUID, A-2	08/22/96	TPHGBW Purgeable TPH/BTEX
9608F05 -02	LIQUID, A-4	08/22/96	MTBE_W Methyl t-Butyl Ethe
9608F05 -02	LIQUID, A-4	08/22/96	TPHGBW Purgeable TPH/BTEX
9608F05 -03	LIQUID, A-6	08/22/96	MTBE_W Methyl t-Butyl Ethe
9608F05 -03	LIQUID, A-6	08/22/96	TPHGBW Purgeable TPH/BTEX
9608F05 -04	LIQUID, A-8	08/22/96	MTBE_W Methyl t-Butyl Ethe
9608F05 -04	LIQUID, A-8	08/22/96	TPHGBW Purgeable TPH/BTEX
9608F05 -05	LIQUID, A-9	08/22/96	MTBE_W Methyl t-Butyl Ethe
9608F05 -05	LIQUID, A-9	08/22/96	TPHGBW Purgeable TPH/BTEX
9608F05 -06	LIQUID, AR-1	08/22/96	MTBE_W Methyl t-Butyl Ethe
9608F05 -06	LIQUID, AR-1	08/22/96	TPHGBW Purgeable TPH/BTEX
9608F05 -07	LIQUID, AR-2	08/22/96	MTBE_W Methyl t-Butyl Ethe
9608F05 -07	LIQUID, AR-2	08/22/96	TPHGBW Purgeable TPH/BTEX
9608F05 -08	LIQUID, TB-1	08/22/96	MTBE_W Methyl t-Butyl Ethe
9608F05 -08	LIQUID, TB-1	08/22/96	TPHGBW Purgeable TPH/BTEX

Please contact me if you have any questions. In the meantime, thank you for the opportunity to work with you on this project.

Very truly yours,

SEQUOIA ANALYTICAL

Claudia Hirotsu
Project Manager

Quality Assurance Department

Sequoia Analytical

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Pacific Environmental Group	Client Proj. ID: 330-109.2I/4931,Oakland	Sampled: 08/22/96
2025 Gateway Place, Suite 440	Sample Descript: A-2	Received: 08/23/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: EPA 8020	Analyzed: 09/05/96
Attention: Kelly Brown	Lab Number: 9608F05-01	Reported: 09/09/96

QC Batch Number: GC090596BTEX17A
Instrument ID: GCHP17

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	2.5	N.D.

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	89

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Claudia Hirotsu
Project Manager

Sequoia Analytical

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Pacific Environmental Group	Client Proj. ID: 330-109.2I/4931,Oakland	Sampled: 08/22/96
2025 Gateway Place, Suite 440	Sample Descript: A-2	Received: 08/23/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 09/05/96
Attention: Kelly Brown	Lab Number: 9608F05-01	Reported: 09/09/96

QC Batch Number: GC090596BTEX17A
Instrument ID: GCHP17

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	**0.50**	**1.1**
Toluene	**0.50**	**1.8**
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	**0.50**	**1.3**

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	89

Analytes reported as N.D. were not present above the stated limit of detection.

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Pacific Environmental Group	Client Proj. ID: 330-109.2I/4931,Oakland	Sampled: 08/22/96
2025 Gateway Place, Suite 440	Sample Descript: A-4	Received: 08/23/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: EPA 8020	Analyzed: 09/05/96
Attention: Kelly Brown	Lab Number: 9608F05-02	Reported: 09/09/96

QC Batch Number: GC090596BTEX17A
Instrument ID: GCHP17

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	25	150

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	107

Analytes reported as N.D. were not present above the stated limit of detection.

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Pacific Environmental Group	Client Proj. ID: 330-109.2I/4931,Oakland	Sampled: 08/22/96
2025 Gateway Place, Suite 440	Sample Descript: A-4	Received: 08/23/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 09/05/96
Attention: Kelly Brown	Lab Number: 9608F05-02	Reported: 09/09/96

QC Batch Number: GC090596BTEX17A
Instrument ID: GCHP17

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	**500**	**3000**
Benzene	**5.0**	**480**
Toluene	5.0	N.D.
Ethyl Benzene	**5.0**	**75**
Xylenes (Total)	**5.0**	**26**
Chromatogram Pattern:		**Gas**

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	107

Analytes reported as N.D. were not present above the stated limit of detection.

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Pacific Environmental Group	Client Proj. ID: 330-109.2I/4931,Oakland	Sampled: 08/22/96
2025 Gateway Place, Suite 440	Sample Descript: A-6	Received: 08/23/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: EPA 8020	Analyzed: 09/04/96
Attention: Kelly Brown	Lab Number: 9608F05-03	Reported: 09/09/96

QC Batch Number: GC090496BTEX20A
Instrument ID: GCHP20

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	2.5	N.D.

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	89

Analytes reported as N.D. were not present above the stated limit of detection.

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Pacific Environmental Group	Client Proj. ID: 330-109.2I/4931,Oakland	Sampled: 08/22/96
2025 Gateway Place, Suite 440	Sample Descript: A-6	Received: 08/23/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 09/04/96
Attention: Kelly Brown	Lab Number: 9608F05-03	Reported: 09/09/96

QC Batch Number: GC090496BTEX20A
Instrument ID: GCHP20

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	89

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

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Pacific Environmental Group	Client Proj. ID: 330-109.2I/4931,Oakland	Sampled: 08/22/96
2025 Gateway Place, Suite 440	Sample Descript: A-8	Received: 08/23/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: EPA 8020	Analyzed: 09/05/96
Attention: Kelly Brown	Lab Number: 9608F05-04	Reported: 09/09/96

QC Batch Number: GC090596BTEX17A
Instrument ID: GCHP17

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	50	4300

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	93

Analytes reported as N.D. were not present above the stated limit of detection.

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Pacific Environmental Group	Client Proj. ID: 330-109.2I/4931,Oakland	Sampled: 08/22/96
2025 Gateway Place, Suite 440	Sample Descript: A-8	Received: 08/23/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 09/05/96
Attention: Kelly Brown	Lab Number: 9608F05-04	Reported: 09/09/96

QC Batch Number: GC090596BTEX17A
Instrument ID: GCHP17

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	1000	8000
Benzene	10	1000
Toluene	10	76
Ethyl Benzene	10	150
Xylenes (Total)	10	96
Chromatogram Pattern:		Gas

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	93

Analytes reported as N.D. were not present above the stated limit of detection.

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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110

Attention: Kelly Brown

Client Proj. ID: 330-109.2I/4931,Oakland
Sample Descript: A-9
Matrix: LIQUID
Analysis Method: EPA 8020
Lab Number: 9608F05-05

Sampled: 08/22/96
Received: 08/23/96

Analyzed: 09/05/96
Reported: 09/09/96

QC Batch Number: GC090596BTEX17A
Instrument ID: GCHP17

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	**2.5**	**8.5**

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	97

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

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Pacific Environmental Group	Client Proj. ID: 330-109.2I/4931,Oakland	Sampled: 08/22/96
2025 Gateway Place, Suite 440	Sample Descript: A-9	Received: 08/23/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 09/05/96
Attention: Kelly Brown	Lab Number: 9608F05-05	Reported: 09/09/96

QC Batch Number: GC090596BTEX17A
Instrument ID: GCHP17

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	97

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

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Pacific Environmental Group	Client Proj. ID: 330-109.2I/4931,Oakland	Sampled: 08/22/96
2025 Gateway Place, Suite 440	Sample Descript: AR-1	Received: 08/23/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: EPA 8020	Analyzed: 09/04/96
Attention: Kelly Brown	Lab Number: 9608F05-06	Reported: 09/09/96

QC Batch Number: GC090496BTEX20A
Instrument ID: GCHP20

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	25	960

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	124

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Claudia Hirotsu
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Proj. ID: 330-109.2I/4931,Oakland	Sampled: 08/22/96
2025 Gateway Place, Suite 440	Sample Descript: AR-1	Received: 08/23/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 09/04/96
Attention: Kelly Brown	Lab Number: 9608F05-06	Reported: 09/09/96

QC Batch Number: GC090496BTEX20A
Instrument ID: GCHP20

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	**500**	**5600**
Benzene	**5.0**	**100**
Toluene	**5.0**	**28**
Ethyl Benzene	**5.0**	**29**
Xylenes (Total)	**5.0**	**310**
Chromatogram Pattern:		**Gas**

Surrogates	**Control Limits %**		**% Recovery**
Trifluorotoluene	70	130	124

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Claudia Hirotsu
Project Manager

Sequoia Analytical

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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110

Attention: Kelly Brown

Client Proj. ID: 330-109.2I/4931,Oakland
Sample Descript: AR-2
Matrix: LIQUID
Analysis Method: EPA 8020
Lab Number: 9608F05-07

Sampled: 08/22/96
Received: 08/23/96

Analyzed: 09/05/96
Reported: 09/09/96

QC Batch Number: GC090596BTEX17A
Instrument ID: GCHP17

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	2.5	200

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	81

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Claudia Hirotsu
Project Manager

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Pacific Environmental Group	Client Proj. ID: 330-109.2I/4931,Oakland	Sampled: 08/22/96
2025 Gateway Place, Suite 440	Sample Descript: AR-2	Received: 08/23/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 09/05/96
Attention: Kelly Brown	Lab Number: 9608F05-07	Reported: 09/09/96

QC Batch Number: GC090596BTEX17A
Instrument ID: GCHP17

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	81

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Claudia Hirotsu
Project Manager

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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110

Attention: Kelly Brown

Client Proj. ID: 330-109.2I/4931,Oakland
Sample Descript: TB-1
Matrix: LIQUID
Analysis Method: EPA 8020
Lab Number: 9608F05-08

Sampled: 08/22/96
Received: 08/23/96

Analyzed: 09/04/96
Reported: 09/09/96

QC Batch Number: GC090496BTEX20A
Instrument ID: GCHP20

Methyl t-Butyl Ether (MTBE)

Analyte	Detection Limit ug/L	Sample Results ug/L
Methyl t-Butyl Ether	2.5	N.D.

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	88

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Claudia Hirotsu
Project Manager

Sequoia Analytical

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Pacific Environmental Group	Client Proj. ID: 330-109.2I/4931,Oakland	Sampled: 08/22/96
2025 Gateway Place, Suite 440	Sample Descript: TB-1	Received: 08/23/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 09/04/96
Attention: Kelly Brown	Lab Number: 9608F05-08	Reported: 09/09/96

QC Batch Number: GC090496BTEX20A
Instrument ID: GCHP20

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	88

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL - ELAP #1210

Claudia Hirotsu
Project Manager

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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Kelly Brown

Client Project ID: 330-109.2I / 4931, Oakland
Matrix: LIQUID
Work Order #: 9608F05 01, 02, 04, 05, 07
Reported: Sep 9, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC090596BTEX17A	GC090596BTEX17A	GC090596BTEX17A	GC090596BTEX17A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	G. Fish	G. Fish	G. Fish	G. Fish
MS/MSD #:	9608F6301	9608F6301	9608F6301	9608F6301
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	9/5/96	9/5/96	9/5/96	9/5/96
Analyzed Date:	9/5/96	9/5/96	9/5/96	9/5/96
Instrument I.D.#:	GCHP17	GCHP17	GCHP17	GCHP17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	11	11	11	32
MS % Recovery:	110	110	110	107
Dup. Result:	11	11	11	33
MSD % Recov.:	110	110	110	110
RPD:	0.0	0.0	0.0	3.1
RPD Limit:	0-25	0-25	0-25	0-25
LCS #:	BLK090596	BLK090596	BLK090596	BLK090596
Prepared Date:	9/5/96	9/5/96	9/5/96	9/5/96
Analyzed Date:	9/5/96	9/5/96	9/5/96	9/5/96
Instrument I.D.#:	GCHP17	GCHP17	GCHP17	GCHP17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	10	10	10	30
LCS % Recov.:	100	100	100	100
MS/MSD Control Limits	60-140	60-140	60-140	60-140
LCS Control Limits	70-130	70-130	70-130	70-130

Quality Assurance Statement: All standard operating procedures and quality control requirements have been met.

SEQUOIA ANALYTICAL

Claudia Hirotsu
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Kelly Brown

Client Project ID: 330-109.21 / 4931, Oakland
Matrix: LIQUID
Work Order #: 9608F05 03, 06, 08

Reported: Sep 9, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC090496BTEX20A	GC090496BTEX20A	GC090496BTEX20A	GC090496BTEX20A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	R. Burton	R. Burton	R. Burton	R. Burton
MS/MSD #:	9508F7304	9508F7304	9508F7304	9508F7304
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	9/4/96	9/4/96	9/4/96	9/4/96
Analyzed Date:	9/4/96	9/4/96	9/4/96	9/4/96
Instrument I.D.#:	GCHP20	GCHP20	GCHP20	GCHP20
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	9.5	9.3	9.2	27
MS % Recovery:	95	93	92	90
Dup. Result:	8.0	7.8	8.0	24
MSD % Recov.:	80	78	80	80
RPD:	17	18	14	12
RPD Limit:	0-25	0-25	0-25	0-25
LCS #:	BLK090496	BLK090496	BLK090496	BLK090496
Prepared Date:	9/4/96	9/4/96	9/4/96	9/4/96
Analyzed Date:	9/4/96	9/4/96	9/4/96	9/4/96
Instrument I.D.#:	GCHP20	GCHP20	GCHP20	GCHP20
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	9.1	9.1	8.8	26
LCS % Recov.:	91	91	88	87
MS/MSD Control Limits	60-140	60-140	60-140	60-140
LCS Control Limits	70-130	70-130	70-130	70-130

SEQUOIA ANALYTICAL

Claudia Hirotsu
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS=Matrix Spike, MSD=MS Duplicate, RPD=Relative % Difference

SEQUOIA ANALYTICAL SAMPLE RECEIPT LOG

CLIENT NAME: ARCO
REC. BY (PRINT): Ken

WORKORDER: 9608F05
DATE OF LOG-IN: 8/20/96

CIRCLE THE APPROPRIATE RESPONSE

1. Custody Seal(s): Present / Absent
   Intact / Broken*
2. Custody Seal Nos.: Put In Remarks Section
3. Chain-of-Custody Records: Present / Absent*
4. Traffic Reports or Packing List: Present / Absent
5. Airbill: Airbill / Sticker Present / Absent
6. Airbill No.:
7. Sample Tags: Present / Absent*
   Sample Tag Nos.: Listed / Not Listed on Chain-of-Custody
8. Sample Condition: Intact / Broken* / Leaking*
9. Does information on custody reports, traffic reports and sample tags agree? Yes / No*
10. Proper preservatives used: Yes / No*
11. Date Rec. at Lab: 8/23/96
12. Temp. Rec. at Lab: 11°C
13. Time Rec. at Lab: 1210

LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION(ETC.)
1	A-C	A-2	3x VOA	Wtr	8/22	
2	↓	4	↓	↓	↓	
3		6				
4		8				
5		9				
6		AR-1				
7	↓	↓ 2	↓			
8	AB	TB-1	2x VOA	↓	↓	

8/23/96

* If Circled, contact Project manager and attach record of resolution

ARCO Products Company
Division of AtlanticRichfieldCompany

330 109 21

Task Order No. 1934800

Chain of Custody

ARCO Facility no. 4931	City 731 (Facility) McArthur Bl Oakland	Project manager (Consultant) Kelly Brown	Laboratory name Sequoia
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 441 7500	Fax no. (Consultant) (408) 441 7539
Consultant name Pacific Environmental Group Inc	Address (Consultant) 2025 Gateway Place Suite 440 San Jose CA 95110		Contract number

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(Gas/Diesel) 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 ☐
A-2	1	3		X		X	X	8/22/96	10:05		X									
A-4	2	|		|		|	|	|	13:00		|			9608F05					
A-6	3	|		|		|	|	|	12:00		|			|				
A-8	4	|		|		|	|	|	13:25		|			|				
A-9	5	|		|		|	|	|	11:35		|			|				
AR-1	6	|		|		|	|	|	12:40		|			|				
AR-2	7	↓		↓		↓	↓	↓	10:35		↓									
TB-1	8	2		↓		↓	↓	↓	N/A		↓									

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number

Turnaround time

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

Condition of sample:

Temperature received:

	Date	Time		Date	Time
Relinquished by sampler: Walter Hart	8/23/96	7:30	Received by: D. Alarcon	8/23/96	7:30
Relinquished by: D. Alarcon	8/23/96	9:15	Received by:		
Relinquished by:			Received by laboratory:	8/23/96	1210

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

ARC 7232 (3-91)

FIELD SERVICES / O & M REQUEST

SITE INFORMATION FORM

Project #:330-109.2I

Station #:4931

Site Address:731 McArthur Bl
Oakland, California

County: Alameda

Project Manager: Kelly Brown

Requestor: Kelly Romero

Client: Arco

Prefield contacts:

☐ **1st time visit**

☐ **1st** ☐ **2nd** ☒ **3rd** ☐ **4th**

☐ **Monthly**

☐ **Semi-Monthly**

☐ **Weekly**

☐ **One time Event**

☐ **Other.**_____

Client P.O.C.: Mike Whelan

Date of Request: 3Q

Ideal Field Date:

Budget Hrs._____

Actual Hrs. 6

Mob de Mob 2.5

Total Purge = 344.0 Gal

Field Tasks: For General Description

Third Quarter 1996 groundwater sampling event: DTW/DTL from TOB/TOC; sample all wells for GAS/BTEX.

WA# 19348 00

Comments, remarks, from Field Staff (include problems encountered

- Unable to sample AR-3 well was inacessable

Completed by: W Reck Date: 8/27/96

Checked by:_____

WELL SAMPLING REQUEST

SAMPLING PROTOCOL								
Project No.	Station #	Project Name	SEQUENCE	Project Manager	Approval	Date/s	Laboratory:	Client Engineer:
330-109.2I	4931	731 McArthur BL Oakland	3Q96	Kelly Brown	6/25/96		Sequoia	Mike Whelan

Well Number	Ideal Sampling Order	Sample I.D.	Sampling Frequency	Analyses	TOB TOC	Well Depth	Casing Diameter	Well goes Dry?	Comments
A-2	1		QLY	MtBE/GAS/BTEX	TOB/TOC	20	4"	yes	
A-3	11		Semiannual 2&4	DTW ONLY	TOB/TOC	17	4"	yes	
A-4	16		QLY	MtBE/GAS/BTEX	TOB/TOC	20	4"	yes	
A-5	2		Semiannual 2&4	DTW ONLY	TOB/TOC	24.5	3"	no	
A-6	14		QLY	MtBE/GAS/BTEX	TOB/TOC	25.5	3"	no	
A-7	13		ANNUAL 2Q	DTW ONLY	TOB/TOC	23	3"	no	
A-8	17		QLY	MtBE/GAS/BTEX	TOB/TOC	18	3"	no	
A-9	12		QLY	MtBE/GAS/BTEX	TOB/TOC	19	6"	no	
A-10	3		REMOVED	DTW ONLY	TOB/TOC	?	?	?	
A-11	6		Semiannual 2&4	DTW ONLY	TOB/TOC	28	3"	no	
A-12	7		Semiannual 2&4	DTW ONLY	TOB/TOC	30	3"	no	
A-13	8		ANNUAL 2Q	DTW ONLY	TOB/TOC	29.5	3"	no	
AR-1	15		QLY	MtBE/GAS/BTEX	TOB/TOC	31.5	6"	no	
AR-2	9		QLY	MtBE/GAS/BTEX	TOB/TOC	27.5	6"	no	
AR-3	10		QLY	MtBE/GAS/BTEX	TOB/TOC	27	6"	no	
TB-1			QLY	MtBE/GAS/BTEX					

FIELD REPORT

DEPTH TO WATER/SEPARATE-PHASE HYDROCARBON SURVEY

PROJECT No.: 330 109 21 LOCATION: 731 McArthur Blvd. Oakland DATE: 8/22/96

CLIENT/STATION NO.: Arco #4931 FIELD TECHNICIAN: (J). Peck DAY OF WEEK: Thurs

PROBE TYPE/ID No.
- ☐ Oil/Water IF/ _____
- ☒ H_2O level indicator _____
- ☐ Other: _____

Casing Size	Dtw Order	Well ID	Time	Surface Seal	Lid Secure	Gasket	Lock	Expanding Cap	TOC Total Depth (feet)	First Depth to Water (feet) TOB/TOC	Second Depth to Water (feet) TOB/TOC	SERARATE-PHASE HYDROCARBONS (SPH) SPH Depth (feet) TOB/TOC	SPH Thickness (feet)	COLOR: Fresh	Weathered	Gas	Oil	VISCOSITY: Lite	Medium	Heavy	LIQUID REMOVED (gallons) SPH / H_2O
4"	1	A-2	8:35	X	X		X		19.45	10.10 / 10.10	10.45 / 10.45										
4"	11	A-3	9:02	X	X		X	X	—	9.80 / 9.80	10.88 / 10.88										
4"	16	A-4	8:20	X	X		X		19.60	10.49 / 10.49	11.03 / 11.03										
4"	2	A-5	8:38	X	X		X		—	10.03 / 10.03	10.70 / 10.70										
3"	14	A-6	9:13	X	X		X		24.80	9.42 / 9.42	10.12 / 10.12										
3"	13	A-7	9:10	X	X		X		—	9.28 / 9.28	9.80 / 9.80										
3"	17	A-8	9:24	X	X				21.70	11.04 / 11.04	11.57 / 11.57										
6"	12	A-9	9:06	X	X				37.80	8.90 / 8.90	9.68 / 9.68										
4"	3	A-10	8:44	O	X				—	10.49 / 10.49	10.98 / 10.98										

Comments: A-5 well box lid cracked (Christy's box)

FIELD REPORT

DEPTH TO WATER/SEPARATE-PHASE HYDROCARBON SURVEY

PROJECT No.: 330 109 21 LOCATION: 731 N. McArthur Blvd. Oakland DATE: 8/12/98

CLIENT/STATION NO.: Arco # 4931 FIELD TECHNICIAN: (J). Peck DAY OF WEEK: Thurs

PROBE TYPE/ID No.
- ☐ Oil/Water IF/. _____
- ☒ H_2O level indicator _____
- ☐ Other: _____

Casing Size	Dtw Order	Well ID	Time	Surface Seal	Lid Secure	Gasket	Lock	Expanding Cap	Total Depth (feet)	First Depth to Water (feet) TOB/TOC	Second Depth to Water (feet) TOB/TOC	SEPARATE-PHASE HYDROCARBONS (SPH): SPH Depth (feet) TOB/TOC	SPH Thickness (feet)	COLOR: Fresh	Weathered	Gas	Oil	VISCOSITY: Lite	Medium	Heavy	LIQUID REMOVED (gallons): SPH / H_2O
3/4	6	A-11	8:47	X	6		X		—	10.42 / 10.42	10.58 / 10.58										
3"	7	A-12	8:50	X	X		X		—	9.22 / 9.22	9.97 / 9.97										
—	8	A-13	—	—	—		Covered			over w/ Assault			—								
6"	15	AR-1	9:17	X	X				29.68	10.60 / 10.60	10.97 / 10.97										
6"	9	AR-2	8:55	X	X				26.55	6.38 / 6.38	7.27 / 7.27										
6"	10	AR-3	8:58	X	X				26.80	10.37 / 10.37	10.84 / 10.84										

Comments: _____

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330109.21 LOCATION: 731 McArthur Blvd Oakland WELL ID #: A-2

CLIENT/STATION No.: Arco #4931 FIELD TECHNICIAN: W Park

WELL INFORMATION

Depth to Liquid: — TOB — TOC
Depth to water: 10.45 TOB 10.10 TOC
Total depth: — TOB 19.45 TOC
Date: 8/22/96 Time (2400): 8:35

Probe Type and I.D. #
- ☐ Oil/Water interface
- ☒ Electronic indicator
- ☐ Other;

CASING DIAMETER / GAL/LINEAR FT.

☐	2	0.17
☐	3	0.38
☒	4	0.66
☐	4.5	0.83
☐	5	1.02
☐	6	1.5
☐	8	2.6

SAMPLE TYPE
- ☒ Groundwater
- ☐ Duplicate
- ☐ Extraction well
- ☐ Trip blank
- ☐ Field blank
- ☐ Equipment blank
- ☐ Other;

TD 19.45 - DTW 10.10 = 9.35 x Gal/Linear Foot .66 = 6.17 x Number of Casings 3 = Calculated Purge 18.51

DATE PURGED: 8/22/96 START: 9:51 END (2400 hr): 10:00 PURGED BY: W Park

DATE SAMPLED: 8/22/96 START: 10:00 END (2400 hr): 10:05 SAMPLED BY: W Park

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
9:55	6.25	7.60	550	68.9	Brown	Mod	None
		DRY AT 6.25 Gal					

Pumped dry (Yes) / No

Cobalt 0-100: Clear, Cloudy, Yellow, Brown
NTU 0-200: Heavy, Moderate, Light, Trace
Odor: Strong, Moderate, Faint, None

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW	TOB/(TOC)	pH	E.C.	TEMPERATURE	COLOR	TURBIDITY	ODOR
18.51	(TOC)	6.07	510	66.4	Brown	Mod	None

PURGING EQUIPMENT/I.D. #
- ☐ Bailer:
- ☐ Airlift Pump:
- ☒ Centrifugal Pump:
- ☐ Dedicated:
- ☐ Other:

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: G-13
- ☐ Dedicated:
- ☐ Other:

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-2	8/22/96	10:05	3	40ml	VOA	HCl	Gas/Btex/MTBE

REMARKS: DRY AT 6.25 Gal

Water Park

PACIFIC

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330109.21 LOCATION: 731 McArthur Blvd Oakland WELL ID #: A-4

CLIENT/STATION No.: Arco #4931 FIELD TECHNICIAN: W Peck

WELL INFORMATION

Depth to Liquid:	— TOB	TOC
Depth to water:	11.03 TOB	10.49 TOC
Total depth:	— TOB	19.60 TOC
Date:	8/22/96 Time (2400):	9:28

Probe Type and I.D. #
- ☐ Oil/Water interface
- ☒ Electronic indicator
- ☐ Other;

CASING DIAMETER / GAL/LINEAR FT.

☐	2	0.17
☐	3	0.38
☑	4	0.66
☐	4.5	0.83
☐	5	1.02
☐	6	1.5
☐	8	2.6

SAMPLE TYPE
- ☒ Groundwater
- ☐ Duplicate
- ☐ Extraction well
- ☐ Trip blank
- ☐ Field blank
- ☐ Equipment blank
- ☐ Other;

TD 19.60 - DTW 10.49 = 9.11 x Gal/Linear Foot .66 = 6.01 x Number of Casings 3 = Calculated Purge 18.03

DATE PURGED: 8/22/96 START: 12:45 END (2400 hr): 12:48 PURGED BY: W Peck

DATE SAMPLED: 8/22/96 START: 12:55 END (2400 hr): 13:00 SAMPLED BY: W Peck

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
12 48	6.0	6.74	1500	69.0	Brown	Mod	Faint
		DRY	AT 6.0	Gal			

Pumped dry (Yes) / No

Cobalt 0-100: Clear, Cloudy, Yellow, Brown
NTU 0-200: Heavy, Moderate, Light, Trace
Strong, Moderate, Faint, None

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW	TOB/(TOC)						
17.22	TOC	6.70	1490	69.5	Brown	Mod	Faint

PURGING EQUIPMENT/I.D. #
- ☐ Bailer:
- ☒ Centrifugal Pump:
- ☐ Airlift Pump:
- ☐ Dedicated:
- ☐ Other:

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer:
- ☐ Dedicated:
- ☐ Other:

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-4	8/22/96	1300	3	40ml	VOA	HCl	Gas/Btex/MTBE

REMARKS: DRY AT 6.0 Gal. Broken Sheen on H2O

W Peck

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 33010921 LOCATION: 731 McArthur Blvd Oakland WELL ID #: A-6

CLIENT/STATION No.: Arco #4931 FIELD TECHNICIAN: W Peck

WELL INFORMATION

Depth to Liquid: — TOB — TOC
Depth to water: 10.12 TOB 9.42 TOC
Total depth: — TOB 24.90 TOC
Date: 8/22/96 Time (2400): 9:13

Probe Type and I.D. #
- ☐ Oil/Water interface
- ☒ Electronic indicator
- ☐ Other;

CASING DIAMETER	GAL/ LINEAR FT.
☐ 2	0.17
☑ 3	0.38
☐ 4	0.66
☐ 4.5	0.83
☐ 5	1.02
☐ 6	1.5
☐ 8	2.6

SAMPLE TYPE
- ☒ Groundwater
- ☐ Duplicate
- ☐ Extraction well
- ☐ Trip blank
- ☐ Field blank
- ☐ Equipment blank
- ☐ Other;

TD 24.90 - DTW 9.42 = 15.48 x Gal/Linear Foot .38 = 5.88 x Number of Casings 3 = Calculated Purge 17.64

DATE PURGED: 8/22/96 START: 11:42 END (2400 hr): 11:57 PURGED BY: W Peck

DATE SAMPLED: 8/22/96 START: 11:57 END (2400 hr): 12:00 SAMPLED BY: W Peck

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
11:47	6.0	6.86	620	73.6	Brown	Heavy	None
11:52	12.0	6.78	690	69.9	Brown	Heavy	None
11:57	18.0	6.77	720	68.4	Brown	Mod	None
					Cobalt 0-100 Clear Cloudy Yellow Brown	NTU 0-200 Heavy Moderate Light Trace	Strong Moderate Faint None

Pumped dry Yes (No)

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW: — TOB/TOC

PURGING EQUIPMENT/I.D. #
- ☐ Bailer:
- ☒ Centrifugal Pump:
- ☐ Other:
- ☐ Airlift Pump:
- ☐ Dedicated:

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: 26.1
- ☐ Dedicated:
- ☐ Other:

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-6	8/22/96	12:00	3	40ml	VOA	HCL	Gas/Btex/MTBE

REMARKS:

W Peck

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330109.21 LOCATION: 731 McArthor Blvd Oakland WELL ID #: A-8

CLIENT/STATION No.: Arco #4931 FIELD TECHNICIAN: W Peck

WELL INFORMATION

Depth to Liquid: — TOB ____ TOC
Depth to water: 11.57 TOB 11.04 TOC
Total depth: — TOB 21.70 TOC
Date: 8/22/96 Time (2400): 9:24

Probe Type and I.D. #
- ☐ Oil/Water interface ____
- ☒ Electronic indicator ____
- ☐ Other: ____

CASING DIAMETER		GAL/ LINEAR FT.
☐	2	0.17
☒	3	0.38
☐	4	0.66
☐	4.5	0.83
☐	5	1.02
☐	6	1.5
☐	8	2.6

SAMPLE TYPE
- ☒ Groundwater
- ☐ Duplicate
- ☐ Extraction well
- ☐ Trip blank
- ☐ Field blank
- ☐ Equipment blank
- ☐ Other: ____

TD 21.70 - DTW 11.04 = 10.66 x Gal/Linear Foot .38 = 4.05 x Number of Casings 3 = Calculated Purge 12.15

DATE PURGED: 8/22/96 START: 13:05 END (2400 hr): 13:10 PURGED BY: W Peck

DATE SAMPLED: 8/22/96 START: 13:20 END (2400 hr): 13:25 SAMPLED BY: W Peck

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
13:08	4.25	6.93	1370	72.9	Brown	Heavy	Strong
13:10	6.25	6.87	1460	70.1	Brown	Heavy	Strong
		DRY AT 6.25					

Cobalt 0-100: Clear, Cloudy, Yellow, Brown
NTU 0-200: Heavy, Moderate, Light, Trace
Strong: Moderate, Faint, None

Pumped dry: Yes / No

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW: 15.85 TOB/TOC 7.71 1290 69.5 Brown Heavy Strong

PURGING EQUIPMENT/I.D. #
- ☐ Bailer: ____
- ☒ Centrifugal Pump: ____
- ☐ Other: ____
- ☐ Airlift Pump: ____
- ☐ Dedicated: ____

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: PS-1
- ☐ Dedicated: ____
- ☐ Other: ____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-8	8/22/96	13:25	3	40ml	VOA	HCl	Gas/BTEX/MTBE

REMARKS: DRY AT 6.25 Gal. Strong on H2O

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330109.21 LOCATION: 731 McArthor Blvd Oakland WELL ID #: A-9

CLIENT/STATION No.: Arco #4931 FIELD TECHNICIAN: W Peck

WELL INFORMATION

Depth to Liquid: — TOB — TOC
Depth to water: 9.68 TOB 8.90 TOC
Total depth: — TOB 37.80 TOC
Date: 8/22/96 Time (2400): 906

Probe Type and I.D. #
- ☐ Oil/Water interface
- ☒ Electronic indicator
- ☐ Other:

CASING DIAMETER		GAL/ LINEAR FT.
☐	2	0.17
☐	3	0.38
☐	4	0.66
☐	4.5	0.83
☐	5	1.02
☑	6	1.5
☐	8	2.6

SAMPLE TYPE
- ☒ Groundwater
- ☐ Duplicate
- ☐ Extraction well
- ☐ Trip blank
- ☐ Field blank
- ☐ Equipment blank
- ☐ Other:

TD 37.80 - DTW 8.90 = 28.90 x Gal/Linear Foot 1.5 = 43.35 x Number of Casings 3 = Calculated Purge 130.05

DATE PURGED: 8/22/96 START: 10:57 END (2400 hr): 11:31 PURGED BY: W Peck

DATE SAMPLED: 8/22/96 START: 11:31 END (2400 hr): 11:35 SAMPLED BY: W Peck

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
11:07	43.50	7.05	750	65.2	Cloudy	Light	None
11:20	87.0	6.85	740	65.8	Clear	Trace	None
11:31	130.50	6.81	730	64.5	Clear	Trace	None

Pumped dry Yes / (No)

Cobalt 0-100, Clear, Cloudy, Yellow, Brown | NTU 0-200, Heavy, Moderate, Light, Trace | Strong, Moderate, Faint, None

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW: — TOB/TOC —

PURGING EQUIPMENT/I.D. #
- ☐ Bailer:
- ☒ Centrifugal Pump:
- ☐ Other:
- ☐ Airlift Pump:
- ☐ Dedicated:

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: G-7
- ☐ Dedicated:
- ☐ Other:

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-9	8/22/96	11:35	3	40ml	VOA	HCL	Gas/Btex/MTBE

REMARKS:

Water Flow

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330109.21 LOCATION: 731 McArthor Blvd Oakland WELL ID #: AR-1

CLIENT/STATION No.: Arco #4931 FIELD TECHNICIAN: W Peck

WELL INFORMATION

Depth to Liquid: — TOB — TOC
Depth to water: 10.97 TOB 10.60 TOC
Total depth: — TOB 29.68 TOC
Date: 8/22/96 Time (2400): 9:17

Probe Type and I.D. #
- ☐ Oil/Water interface
- ☒ Electronic Indicator
- ☐ Other:

CASING DIAMETER		GAL/ LINEAR FT.
☐	2	0.17
☐	3	0.38
☐	4	0.66
☐	4.5	0.83
☐	5	1.02
☒	6	1.5
☐	8	2.6

SAMPLE TYPE
- ☒ Groundwater
- ☐ Duplicate
- ☐ Extraction well
- ☐ Trip blank
- ☐ Field blank
- ☐ Equipment blank
- ☐ Other:

TD 29.68 - DTW 10.60 = 19.08 x Gal/Linear Foot 1.5 = 28.62 x Number of Casings 3 = Calculated Purge 85.86

DATE PURGED: 8/22/96 START: 12:04 END (2400 hr): 12:28 PURGED BY: W Peck

DATE SAMPLED: 8/22/96 START: 12:35 END (2400 hr): 12:40 SAMPLED BY: W Peck

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
12:19	28.75	6.58	1090	67.4	Brown	Mod	Faint
12:28	52.0	6.93	940	68.5	Brown	Mod	Faint
		DRY AT 52.0					

Pumped dry (Yes) / No

Color: Cobalt 0-100, Clear, Cloudy, Yellow, Brown
Turbidity: NTU 0-200, Heavy, Moderate, Light, Trace
Odor: Strong, Moderate, Faint, None

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW:	TOB/TOC			COLOR	TURBIDITY	ODOR
27.30	6.85	980	68.9	Brown	Mod	Faint

PURGING EQUIPMENT/I.D. #
- ☐ Bailer:
- ☐ Airlift Pump:
- ☒ Centrifugal Pump:
- ☐ Dedicated:
- ☐ Other:

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: G-7
- ☐ Dedicated:
- ☐ Other:

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
AR-1	8/22/96	1240	3	40ml	VOA	HCL	Gas/Btex/MTBE

REMARKS: DRY AT 52.0 Gal

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330109.21 LOCATION: 731 McArthur Blvd Oakland WELL ID #: AR-2

CLIENT/STATION No.: Arco #4931 FIELD TECHNICIAN: W Peck

WELL INFORMATION

Depth to Liquid: — TOB ____ TOC
Depth to water: DRY TOB 6.38 TOC
Total depth: — TOB 26.55 TOC
Date: 8/22/96 Time (2400): 8.55

Probe Type and I.D. #
- ☐ Oil/Water interface ____
- ☒ Electronic indicator ____
- ☐ Other; ____

CASING DIAMETER		GAL/ LINEAR FT.
☐	2	0.17
☐	3	0.38
☐	4	0.66
☐	4.5	0.83
☐	5	1.02
☑	6	1.5
☐	8	2.6

SAMPLE TYPE
- ☒ Groundwater
- ☐ Duplicate
- ☐ Extraction well
- ☐ Trip blank
- ☐ Field blank
- ☐ Equipment blank
- ☐ Other; ____

TD 26.55 - DTW 6.38 = 20.17 x Gal/Linear Foot 1.5 = 30.25 x Number of Casings 3 = Calculated Purge 90.76

DATE PURGED: 8/22/96 START: 10:10 END (2400 hr): 10:31 PURGED BY: W Peck

DATE SAMPLED: 8/22/96 START: 10:31 END (2400 hr): 10:35 SAMPLED BY: W Peck

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 2 5°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
10:18	30.25	6.10	850	68.2	Cloudy	Light	None
10:26	60.50	6.57	880	67.7	Clear	Trace	None
10:31	90.75	6.72	900	69.4	Clear	Trace	None

Pumped dry Yes (No)

Cobalt 0-100: Clear, Cloudy, Yellow, Brown
NTU 0-200: Heavy, Moderate, Light, Trace
Strong, Moderate, Faint, None

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW: ____ TOB/TOC ____

PURGING EQUIPMENT/I.D. #
- ☐ Bailer: ____
- ☒ Centrifugal Pump: ____
- ☐ Airlift Pump: ____
- ☐ Dedicated: ____
- ☐ Other: ____

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: 15.2
- ☐ Dedicated: ____
- ☐ Other: ____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
AR-2	8/22/96	10:35	3	40ml.	VOA	HCL	Gas/Btex/MTBE

REMARKS: ____

Walter Hall

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330109.21 LOCATION: 731 McArthor Blvd Oakland WELL ID #: AR-3

CLIENT/STATION No.: Arco #4931 FIELD TECHNICIAN: W Peck

WELL INFORMATION

Depth to Liquid: — TOB — TOC
Depth to water: 10.84 TOB 10.37 TOC
Total depth: — TOB 26.80 TOC
Date: 8/22/96 Time (2400): 8:58

Probe Type and I.D. #
- ☐ Oil/Water interface
- ☒ Electronic indicator
- ☐ Other;

CASING DIAMETER		GAL/ LINEAR FT.
☐	2	0.17
☐	3	0.38
☐	4	0.66
☐	4.5	0.83
☐	5	1.02
☒	6	1.5
☐	8	2.6

SAMPLE TYPE
- ☒ Groundwater
- ☐ Duplicate
- ☐ Extraction well
- ☐ Trip blank
- ☐ Field blank
- ☐ Equipment blank
- ☐ Other;

TD 26.80 - DTW 10.37 = 16.43 x Gal/Linear Foot 1.5 = 24.64 x Number of Casings 3 = Calculated Purge 73.93

DATE PURGED: 8/22/96 START: ____ END (2400 hr): ____ PURGED BY: W Peck

DATE SAMPLED: 8/22/96 START: ____ END (2400 hr): ____ SAMPLED BY: W Peck

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
	24.75						
		NO SAMPLE TAKEN					

Pumped dry Yes / No

Cobalt 0-100: Clear, Cloudy, Yellow, Brown
NTU 0-200: Heavy, Moderate, Light, Trace
Strong, Moderate, Faint, None

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW: ____ TOB/TOC ____

PURGING EQUIPMENT/I.D. #
- ☐ Bailer:
- ☒ Centrifugal Pump:
- ☐ Airlift Pump:
- ☐ Dedicated:
- ☐ Other:

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer:
- ☐ Dedicated:
- ☐ Other:

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
AR-3	8/22/96		3	40ml	VOA	HCL	Gas/Btex/MTBE

REMARKS: Well not accessable

Walter Peck

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330109.21 LOCATION: 731 McArthur Blvd Oakland WELL ID #: TB-1

CLIENT/STATION No.: Arco #4931 FIELD TECHNICIAN: W Peck

WELL INFORMATION

Depth to Liquid: ___ TOB ___ TOC
Depth to water: ___ TOB ___ TOC
Total depth: ___ TOB ___ TOC
Date: 8/22/96 Time (2400): ___

Probe Type and I.D. #
- ☐ Oil/Water interface ___
- ☒ Electronic indicator ___
- ☐ Other; ___

CASING DIAMETER	GAL/LINEAR FT.
☐ 2	0.17
☐ 3	0.38
☐ 4	0.66
☐ 4.5	0.83
☐ 5	1.02
☐ 6	1.5
☐ 8	2.6

SAMPLE TYPE
- ☒ Groundwater
- ☐ Duplicate
- ☐ Extraction well
- ☒ Trip blank
- ☐ Field blank
- ☐ Equipment blank
- ☐ Other; ___

TD ___ - DTW ___ = ___ x Gal/Linear Foot ___ = ___ x Number of Casings 3 = Calculated Purge ___

DATE PURGED: 8/22/96 START: ___ END (2400 hr): ___ PURGED BY: W Peck

DATE SAMPLED: 8/22/96 START: ___ END (2400 hr): ___ SAMPLED BY: W Peck

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
			TRIP BLANK				
					Cobalt 0-100 Clear Cloudy Yellow Brown	NTU 0-200 Heavy Moderate Light Trace	Strong Moderate Faint None

Pumped dry Yes / No

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW: ___ TOB/TOC

PURGING EQUIPMENT/I.D. #
- ☐ Bailer: ___
- ☒ Centrifugal Pump: ___
- ☐ Other: ___
- ☐ Airlift Pump: ___
- ☐ Dedicated: ___

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: ___
- ☐ Dedicated: ___
- ☐ Other: ___

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
TB-1	8/22/96	N/A	3	40ml	VOA	HCL	Gas/Btex/MTBE

REMARKS: ___

Walter P. Moran

PACIFIC

ARCO Products Company

Division of AtlanticRichfieldCompany

330 109 21

Task Order No. 1934800

Chain of Custody

ARCO Facility no. 4931	City 731 (Facility) McArthur Bl Oakland	Project manager (Consultant) Kelly Brown	Laboratory name Sequoia
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no (408) 441 7500 (Consultant)	Fax no. (408) 441 7539 (Consultant)
Consultant name Pacific Environmental Group Inc	Address (Consultant) 2025 Gateway Place Suite 440 San Jose CA 95110		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 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 ☐		
A-2		3		X		X	X (HCL)	8/22/96	10:05		X											
A-4									13:00													
A-6									12:00													
A-8									13:25													
A-9									11:35													
AR-1									12:40													
AR-2									10:35													
TB-1		2		V		V	V	V	N/A		V											

Condition of sample:

Temperature received:

Relinquished by sampler Walter Hart	Date 8/23/96	Time 7130	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory / Date / Time

Remarks

Lab number

Turnaround time

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

Special detection Limit/reporting

Special QA/QC

Method of shipment

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

ATTACHMENT D

REMEDIAL SYSTEM PERFORMANCE EVALUATION

Conclusions

Oxygen enhancement program will continue during fourth quarter 1996. PACIFIC will perform intrinsic bioremediation evaluation during fourth quarter 1996.

Attachments:
- Table D-1 - Historical Groundwater Extraction System Performance Data
- Table D-2 - Historical Groundwater Extraction System Analytical Data
- Table D-3 - Bioremediation Enhancement Program Data
- Figure D-1 - Historical Groundwater Extraction System Mass Removal Trend
- Figure D-2 - Historical Groundwater Extraction System Hydrocarbon Concentrations

Table D-1
Historical Groundwater Extraction System Performance Data

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Sample I.D.	Date Sampled	Totalizer Reading (gallons)	Net Volume (gallons)	Average Flow Rate (gpm)	TPPH as Gasoline: Influent Concentration (µg/L)	TPPH as Gasoline: Net Removed (lbs)	TPPH as Gasoline: Removed to Date (lbs)	Benzene: Influent Concentration (µg/L)	Benzene: Net Removed (lbs)	Benzene: Removed to Date (lbs)	Primary Carbon Loading (percent)
INFL	06/28/94 a	4,120,050	N/A	0.9	740	0.000	1.61	38	0.000	0.38	2.0
INFL	07/15/94	4,143,150	23,100	0.9	ND	0.071	1 68	ND	0.004	0.38	2.1
INFL	08/18/94	4,175,310	32,160	0.7	NS	0.099	1.78	NS	0.005	0.39	2.2
INFL	09/30/94	4,243,295 b	67,985	1.1	NS	0.210	1.99	NS	0.011	0.40	2.5
INFL	10/31/94 c	4,311,280	67,985	1.5	ND	0.000	1.99	ND	0.000	0.40	2.5
INFL	11/04/94	4,330,500	19,220	3.3	56	0.004	2.00	ND	0.000	0.40	2.5
INFL	12/16/94	4,352,780	22,280	0 4	NS d	0.005	2.00	NS d	0.000	0.40	2.5
INFL	01/05/95	4,382,610	29,830	1 0	1,000	0.131	2.13	87	0.011	0.41	2.7
INFL	02/07/95	4,430,130 e	47,520	1.0 e	NS d	0.209	2.34	NS d	0.017	0.43	2.9
INFL	03/03/95	4,464,690 e	34,560	1.0 e	NS d	0.152	2 49	NS d	0.013	0 44	3.1
INFL	04/13/95	23 f	59,040	1.0 e	ND	0.246	2.74	ND	0.021	0.46	3.4
INFL	05/01/95	12,138	12,115	0.5	ND	0.000	2.74	ND	0.000	0.46	3.4
INFL	06/09/95	36,412	24,274	0 4	ND	0.000	2.74	ND	0.000	0.46	3.4
INFL	07/05/95 g	121,199	84,787	2.3	ND	0.000	2 74	0.59	0.000	0.46	3.4
REPORTING PERIOD: 06/31/96 - 09/30/96 (g)											
TOTAL POUNDS REMOVED:							**2.74**			**0.46**	
TOTAL GALLONS REMOVED:							**0.45**			**0.06**	
PERIOD POUNDS REMOVED:						**0.00**			**0.00**		
PERIOD GALLONS REMOVED:						**0.00**			**0.00**		
TOTAL GALLONS EXTRACTED:					**4,643,696 (e)**						
PERIOD GALLONS EXTRACTED:					**N/A**						
PERIOD AVERAGE FLOW RATE (gpm):					**N/A**						
PRIMARY BED CAPACITY REMAINING (%):					**96.6**						

TPPH = Total purgeable petroleum hydrocarbons
gpm = Gallons per minute
µg/L = Micrograms per liter
lbs = Pounds
N/A = Not available
ND = Not detected
NS = Not sampled

a. Data prior to October 1, 1994 provided by prior consultant.
b. No operational or analytical data available; totalizer reading, flow rate, and sample estimated from prior event July 15, 1994.
c. Pacific Environmental Group, Inc. became consultant for the site as of October 1, 1994.
d. Sampled quarterly; concentrations assumed from prior sampling event.
e. Totalizer broken; volume estimated using 1.0 gpm based on prior sampling event.
f. Totalizer replaced and recalibrated on April 13, 1995.
g. System shut down on 07/05/95 for review, due to low concentrations and removal rates.

Carbon loading assumes an 8% isotherm.
Mass removed is an approximation calculated using averaged concentrations.
Pounds of hydrocarbons removed to date provided by prior consultant.
Prior to June 1995, TPPH as gasoline was reported as TPH calculated as gasoline.
See certified analytical reports for detection limits.

Table D-2
Historical Groundwater Extraction System Analytical Data

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Sample I.D.	Date Sampled	TPPH as Gasoline (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)
INFL	10/31/94	ND	ND	ND	ND	ND
	11/09/94	56	ND	ND	ND	2.7
	01/05/95	1,000	87	9	ND	160
	04/13/95	ND	ND	ND	ND	ND
	05/01/95	ND	ND	ND	ND	ND
	06/09/95	ND	ND	ND	ND	ND
	07/05/95	ND	0.59	ND	ND	ND
MID-1	11/09/94	ND	ND	ND	ND	ND
	01/05/95	ND	ND	ND	ND	ND
	04/13/95	ND	ND	ND	ND	ND
	05/01/95	ND	ND	ND	ND	ND
MID-2	11/09/94	ND	ND	ND	ND	ND
	01/05/95	ND	ND	ND	ND	ND
	04/13/95	ND	ND	ND	ND	ND
	05/01/95	ND	ND	ND	ND	ND
	06/09/95	ND	ND	ND	ND	ND
	07/05/95	ND	ND	ND	ND	ND
EFFL	10/31/94	ND	ND	ND	ND	ND
	11/09/94	ND	ND	ND	ND	ND
	01/05/95	ND	ND	ND	ND	ND
	04/13/95	ND	ND	ND	ND	ND
	05/01/95	ND	ND	ND	ND	ND
	06/09/95	ND	ND	ND	ND	ND
	07/05/95	ND	ND	ND	ND	ND

TPPH = Total purgeable petroleum hydrocarbons
µg/L = Micrograms per liter
ND = Not detected above detection limits
Pacific Environmental Group, Inc. became consultant to site 10/01/94.
Prior to June 1995, TPPH as gasoline was reported as TPH calculated as gasoline.
GWE system was deactivated on 07/05/95.
See certified analytical reports for detection limits.

Table D-3
Bioremediation Enhancement Program Data

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

		Field Analyses				Laboratory Analyses			
Well	Date Sampled	Groundwater Temperature (deg F)	pH (units)	Conductivity (µmhos)	DO (mg/L)	Nitrite as Nitrite (mg/L)	Nitrate as Nitrate (mg/L)	TPPH as Gasoline (µg/L)	Total BTEX (µg/L)
A-8	05/22/96 †	71.1	6.46	1045	0.3	0.17	18	14,000	3,470
A-9	11/17/95 *	69.3	6.39	560	0.7	<1.0	22	NS	NS
	05/22/96 **	76.0	6.69	720	3.8	<1.0	41	ND	ND

deg F = Degrees Fahrenheit
µmhos = Microhmos
DO = Dissolved oxygen
TPPH = Total purgeable petroleum hydrocarbons
BTEX = Benzene, toluene, ethylbenzene, and xylenes
mg/L = Milligrams per liter
µg/L = Micrograms per liter
ND = Not detected above the method detection limit
NS = Not sampled
* = Eight 2-inch diameter ORC units installed in Well A-9.
** = ORC units replaced with the same number originally installed.
† = Thirteen 2-inch diameter ORC units installed in Well A-8.
All data collected before original or any subsequent ORC installation, following standard purging protocol.

Figure D-1
Historical Groundwater Extraction System Mass Removal Trend

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

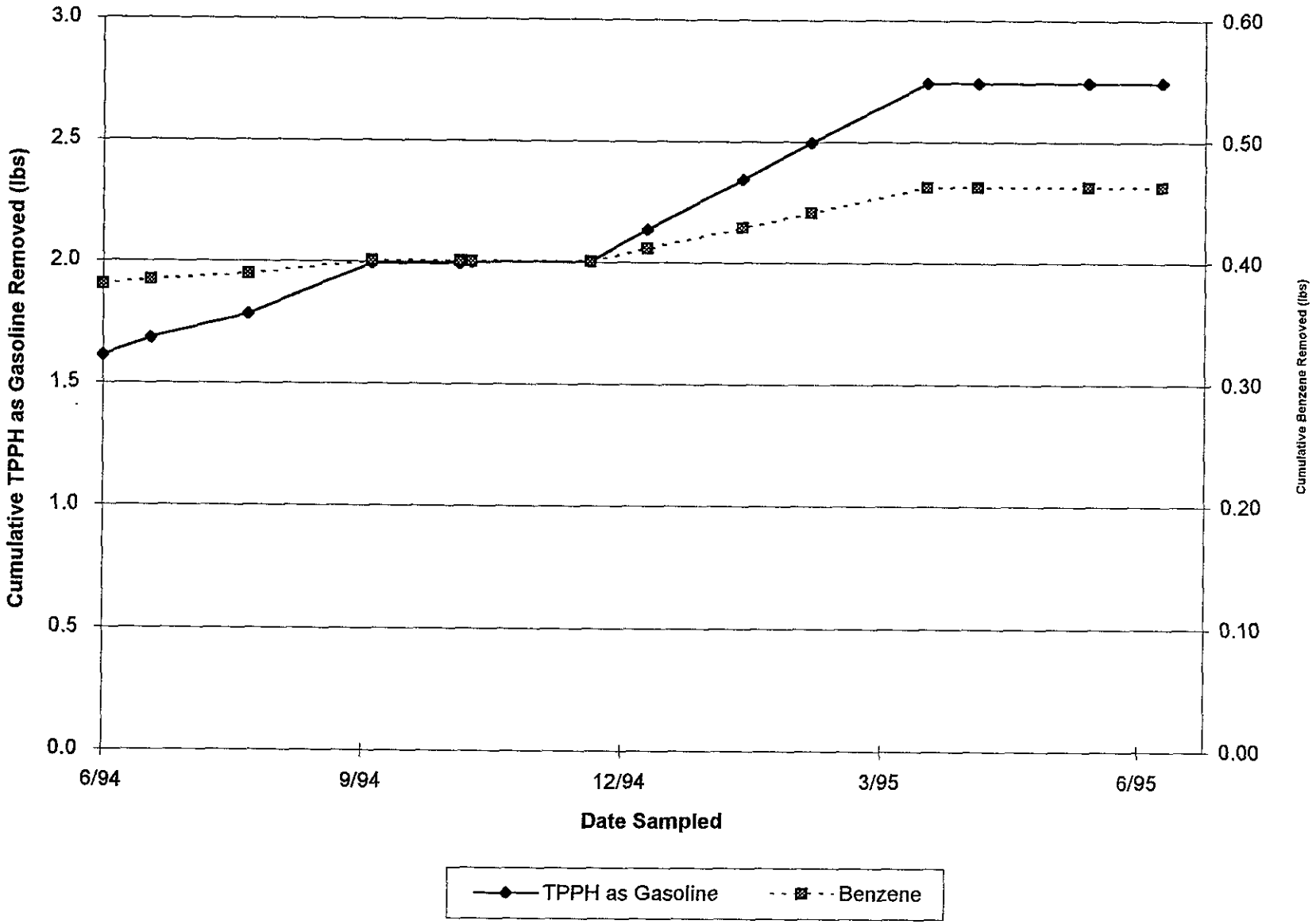

Figure D-2
Historical Groundwater Extraction System Hydrocarbon Concentrations

ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California