PACIFIC
ENVIRONMENTAL
GROUP INC.

March 15, 1996
Project 330-109.2B

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

Re: Quarterly Report - Fourth Quarter 1995
Remedial System Performance Evaluation
ARCO Service Station 4931
731 West MacArthur Boulevard at West Street
Oakland, California

Dear Mr. Whelan:

This letter, prepared by Pacific Environmental Group, Inc. (PACIFIC) on behalf of ARCO Products Company (ARCO), presents the results of the fourth quarter 1995 groundwater monitoring and performance evaluation of the groundwater extraction (GWE) system at the site referenced above. In addition, a summary of work performed and anticipated at the site is included.

QUARTERLY GROUNDWATER MONITORING RESULTS

Groundwater samples were collected from Wells A-2 through A-6, A-11, A-12, and AR-1 through AR-3 by PACIFIC on November 3, 1995, and analyzed for the presence of total purgeable petroleum hydrocarbons calculated as gasoline (TPPH-g), benzene, toluene, ethylbenzene, and xylenes (BTEX compounds). In addition, groundwater samples from Wells A-3, A-5, A-11, and A-12 were analyzed for total methyl t-butyl ether (MTBE). Wells A-7 through A-10 were not sampled. Well A-7 is sampled annually in the second quarter and Well A-8 contained separate-phase hydrocarbons (SPH). Well A-9 was inadvertently not sampled, and Well A-10 was removed from the sampling schedule. A groundwater sampling schedule is presented in Table 1. Field and laboratory procedures are presented as Attachment A. Certified analytical reports, chain-of-custody documentation, and field data sheets are presented as Attachment B.

Depth to water data collected during the November 1995 sampling event indicate that groundwater elevation changes in site monitoring wells are mixed but, on average, have decreased approximately 0.39 foot since August 8, 1995. Groundwater flow is toward the west-southwest at an approximate gradient of 0.009. Groundwater elevation data are presented in Table 2. A liquid surface elevation contour map based on the November 1995 data is shown on Figure 1.

The results of groundwater sampling this quarter indicate that TPPH-g and benzene concentrations are generally consistent with previous quarterly data. TPPH-g and benzene were below the detection limit in Wells A-2, A-3, A-5, A-6, A-11, A-12, AR-2, and AR-3. TPPH-g and benzene concentrations in remaining site wells ranged from 1,200 to 7,400 parts per billion (ppb), and from 22 to 130 ppb, respectively. Groundwater analytical data are presented in Tables 3 and 4. A TPPH-g and benzene concentration map is shown on Figure 2.

REMEDIAL PERFORMANCE EVALUATION

Remedial action consisting of GWE was initiated on November 10, 1992. Remedial objectives for the site include: (1) migration control of the impacted groundwater plume, and (2) petroleum hydrocarbon mass reduction. To evaluate GWE system performance, PACIFIC monitors groundwater levels, instantaneous and average flow rates, evaluates and analyzes samples of system influent and effluent for TPPH-g and BTEX compound concentrations. Below is a brief description of the GWE system and an evaluation of its performance from September 30 to December 31, 1995.

GROUNDWATER EXTRACTION SYSTEM

System Description

The treatment system utilizes electric GWE pumps in Wells A-9, AR-1, AR-2, and AR-3, and three 1,500-pound granular activated carbon vessels arranged in series to treat the influent groundwater stream prior to being discharged into the sanitary sewer system. Sample ports are located at the treatment system influent (Sample Point D), between the carbon vessels (Sample Point C at Mid-1, and Sample Point B at Mid-2), and at the effluent (Sample Point A). The treated groundwater is discharged into the sanitary sewer system under East Bay Municipal Utility District Permit Account Number 502-62131, which expires November 1, 1997.

Migration Control

Progress toward meeting the migration control objective is evaluated by comparison of the groundwater elevation contour map (Figure 1) and TPPH-g and benzene concentra-

tion map (Figure 2) from previous and current groundwater monitoring events. The GWE system was not operational during the fourth quarter 1995 monitoring event; therefore, the migration control objective could not be fully evaluated. PACIFIC has initiated semiannual sampling of downgradient Monitoring Wells A-11 and A-12 to assess the stability of the impacted plume while the GWE system remains inactive. As indicated by Figure 2, TPPH-g and benzene concentration results from Wells A-11 and A-12 remained below detection limits during the current quarter sampling event.

Mass Reduction

Progress toward meeting the mass reduction objective is determined by evaluating the GWE system mass removal data and the TPPH-g concentration trends in associated groundwater monitoring wells. GWE system flow data are collected monthly. GWE system analytical data are obtained quarterly. The system flow and influent sample analysis data are used to estimate dissolved TPPH-g mass removal values. During the reporting period, the GWE system was not operational; therefore, neither TPPH-g nor benzene masses were removed from the impacted groundwater beneath the site. To date, GWE has removed approximately 2.74 pounds (0.45 gallon) of TPPH-g and 0.46 pound (0.06 gallon) of benzene from impacted groundwater beneath the site. During this period, no SPH were removed from any site wells. To date, 23 pounds (3.75 gallons) of SPH have been removed from the site groundwater monitoring wells. Mass removal data for the GWE system are presented in Table 5. GWE system analytical data are presented in Table 6. Graphical presentations of mass removal and TPPH-g and benzene data are shown on Figures 3 and 4, respectively. Progress toward site remediation is presented in the following table.

	Mass Removed			
	09/30/95 to 12/31/95		Cumulative	
Analyte	(lbs)	(gal)	(lbs)	(gal)
Groundwater Extraction				
TPPH-g	0.00	0.00	2.74	0.45
Benzene	0.00	0.00	0.46	0.06
SPH	<0.10	<0.01	23	3.75

lbs = Pounds
gal = Gallons
TPPH-g = Total purgeable petroleum hydrocarbons calculated as gasoline
SPH = Separate-phase hydrocarbons
Cumulative mass removed up to 10/31/94 was obtained from available data provided by the previous consultant.
GWE system was deactivated on July 5, 1995.

GWE System Operational Data

As indicated in PACIFIC's second quarter 1995 report, the GWE was deactivated on July 5, 1995, and remained inactive during the reporting period.

BIOREMEDIATION ENHANCEMENT PROGRAM

At the request of ARCO, PACIFIC initiated an in-situ bioremediation enhancement program at Well A-9 on November 17, 1995, utilizing oxygen releasing compound (ORC) manufactured by Regenesis Bioremediation Products, Inc. ORC is a formulation of very fine, insoluble magnesium peroxide that releases oxygen at a slow, controlled rate when hydrated. ORC product literature is presented as Attachment C.

Following removal of the extraction pump from Well A-9, eight ORC socks were installed below the groundwater surface in Well A-9. To evaluate the program, baseline concentrations of dissolved oxygen, nitrate, and nitrite concentrations in groundwater at Well A-9 were obtained prior to ORC installation (Table 7). The aforementioned parameters will be monitored during future quarterly sampling events. Initial program evaluation results will be presented in PACIFIC's first quarter 1996 report. Field data sheets and certified analytical reports are presented as Attachment B.

CONCLUSIONS

As indicated in PACIFIC's second quarter 1995 report, the GWE system was shut down on July 5, 1995 due to low TPPH-g and benzene mass removal rates and demonstrated stability of the impacted groundwater plume. Quarterly groundwater monitoring at the site will be continued to verify that conditions remain stable; in particular, that the hydrocarbon plume remains stagnant.

During the meeting attended by ARCO, PACIFIC, and Alameda County Health Care Services Agency (ACHCSA) on October 5, 1995, it was agreed that the operation of the GWE system was no longer required unless quarterly groundwater monitoring indicates a plume migration during the verification monitoring period, at which point GWE will be resumed.

In light of recent regulatory developments, PACIFIC will continue liaison with the Regional Water Quality Control Board (RWQCB) and ACHCSA regarding site closure. In addition, based on the criteria indicated in PACIFIC's third quarter 1995 report, PACIFIC has reduced the groundwater sampling frequency at site wells beginning with the third quarter 1995 groundwater monitoring and sampling event. A groundwater sampling schedule is presented in Table 1.

SUMMARY OF WORK

Work Performed Fourth Quarter 1995

- Prepared and submitted third quarter 1995 groundwater monitoring and remedial system evaluation report.
- Sampled site wells for fourth quarter 1995 groundwater monitoring program. Sampling performed by PACIFIC.
- Prepared fourth quarter 1995 groundwater monitoring and remedial system performance evaluation report.
- Met with the ACHCSA to discuss site closure requirements.

Work Anticipated First Quarter 1996

- Prepare and submit fourth quarter 1995 groundwater monitoring and remedial system performance evaluation report.
- Sample site wells for first quarter 1996 groundwater monitoring program. Sampling to be performed by PACIFIC.
- Prepare first quarter 1996 groundwater monitoring and remedial system performance evaluation report.
- Continue liaison with the ACHCSA and RWQCB regarding site closure.

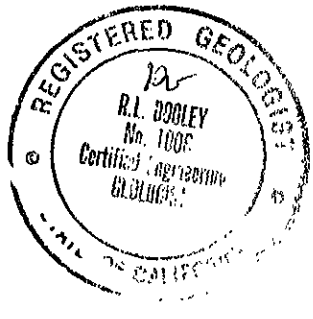
If there are any questions regarding the contents of this letter, please call.

Sincerely,

Pacific Environmental Group, Inc.

Shaw E. Garakani
Project Engineer

R. Lee Dooley
Senior Geologist
CEG 1006



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Attachments:
- Table 1 - Groundwater Sampling Schedule
- Table 2 - Liquid Surface Elevation Data
- Table 3 - Groundwater Analytical Data - Total Purgeable Petroleum Hydrocarbons (TPPH as Gasoline and BTEX Compounds)
- Table 4 - Groundwater Analytical Data - Total Methyl t-Butyl Ether
- Table 5 - Groundwater Extraction System Performance Data
- Table 6 - Groundwater Extraction System Analytical Data - Total Purgeable Petroleum Hydrocarbons (TPPH as Gasoline and BTEX Compounds)
- Table 7 - Groundwater Biodegradation Study Field and Laboratory Data
- Figure 1 - Liquid Surface Elevation Contour Map
- Figure 2 - TPPH-g/Benzene Concentration Map
- Figure 3 - Groundwater Extraction System Mass Removal Trend
- Figure 4 - Groundwater Extraction System Hydrocarbon Concentrations
- Attachment A - Field and Laboratory Procedures
- Attachment B - Certified Analytical Reports, Chain-of-Custody Documentation, and Field Data Sheets
- Attachment C - ORC Product Literature

cc: Mr. Kevin Graves, Regional Water Quality Control Board - San Francisco Bay Region
Ms. Susan Hugo, Alameda County Health Care Services Agency
Ms. Sue Jenne, East Bay Municipal Utility District

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	a	a	Quarterly
A-9	a	a	a	a	Quarterly
A-10	---------- Removed from Sampling Program ----------				
A-11		a		a	Semiannually
A-12		a		a	Semiannually
A-13		a			Annually
AR-1	a	a	a	a	Quarterly
AR-2	a	a	a	a	Quarterly
AR-3	a	a	a	a	Quarterly

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

Table 2
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 2 (continued)
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 2 (continued)
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 2 (continued)
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 2 (continued)
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		8.00	8.00	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 2 (continued)
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 2 (continued)
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 3
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 3 (continued)
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 3 (continued)
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 3 (continued)
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	08/06/93	<50	<0.5	<0.5	<0.5	<0.5
(cont.)	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				
	10/26/92	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 3 (continued)
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 3 (continued)
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 3 (continued)
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 3 (continued)
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 (cont.)	08/08/95	<50	<0.50	<0.50	<0.50	<0.50
	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 4
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

Table 5
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: 09/30/95 (g) - 12/31/95											
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:					**0.0**						
PERIOD AVERAGE FLOW RATE (gpm):					**0.0**						
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 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 6
Groundwater Extraction System 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

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

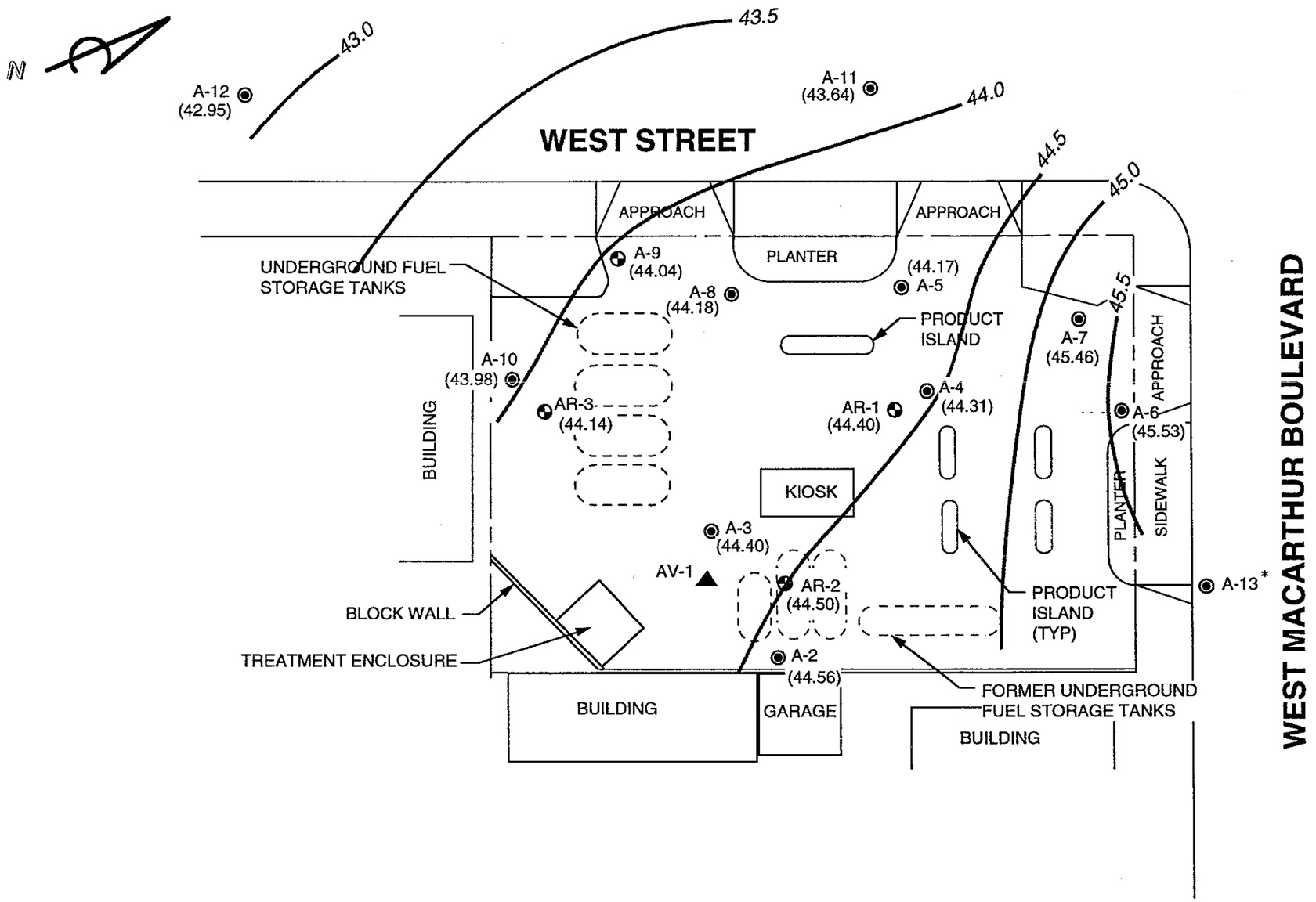
µg/L = Micrograms per liter
ND = Not detected above detection limits
Pacific Environmental Group, Inc. became consultant to site 10/01/94.
Prior to June 1995, TPPH as gasoline was reported as TPH calculated as gasoline.
GWE system was deactivated on 07/05/95.
See certified analytical reports for detection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

Table 7
Groundwater Biodegradation Study Field and Laboratory 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)
A-9	11/17/95	69.3	6.39	560	0.7	<1.0	22

deg F = Degrees Fahrenheit
µmhos = Microhmos
DO = Dissolved oxygen
mg/L = Milligrams per liter



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

(44.18) LIQUID SURFACE ELEVATION IN FEET - MSL, 11-3-95

43.5 LIQUID SURFACE ELEVATION CONTOUR IN FEET - MSL, 11-3-95

* WELL NOT MEASURED

APPROXIMTE DIRECTION OF HISTORICAL GROUNDWATER FLOW

APPROXIMATE GRADIENT = 0.009

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

PACIFIC ENVIRONMENTAL GROUP, INC.

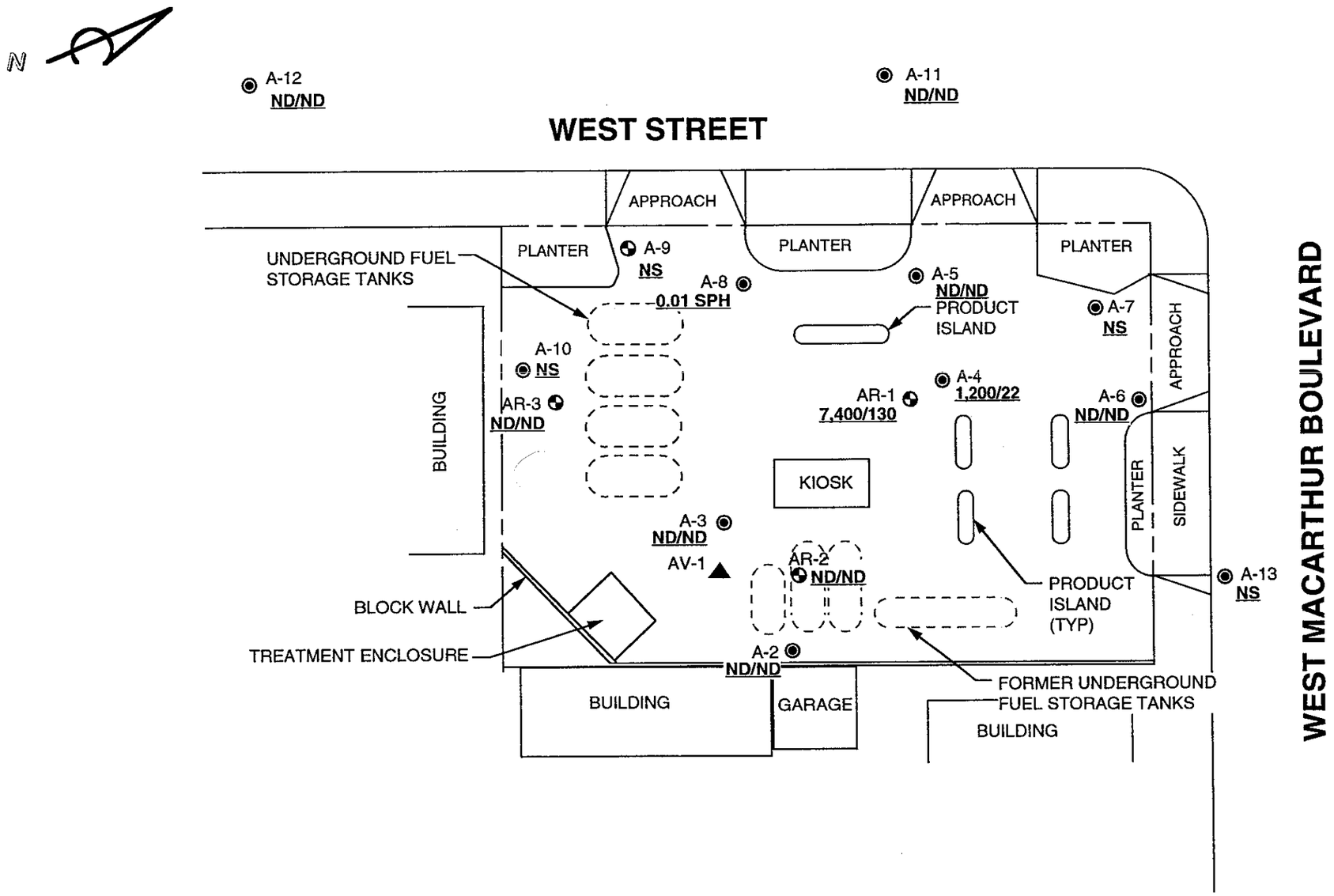
SCALE
0 30 60 FEET

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

LIQUID SURFACE ELEVATION CONTOUR MAP

FIGURE: **1**

PROJECT: 330-109.2B



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
- 1,200/22 TPPH-g/BENZENE CONCENTRATION IN GROUNDWATER, IN PARTS PER BILLION, 11-3-95 (LABORATORY SAMPLED PER 8015M/8020)
- 0.01 SPH SEPARATE-PHASE HYDROCARBON THICKNESS IN FEET, 11-3-95
- ND NOT DETECTED
- NS NOT SAMPLED

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: 330-109.2B

Figure 3
Groundwater Extraction System Mass Removal Trend

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

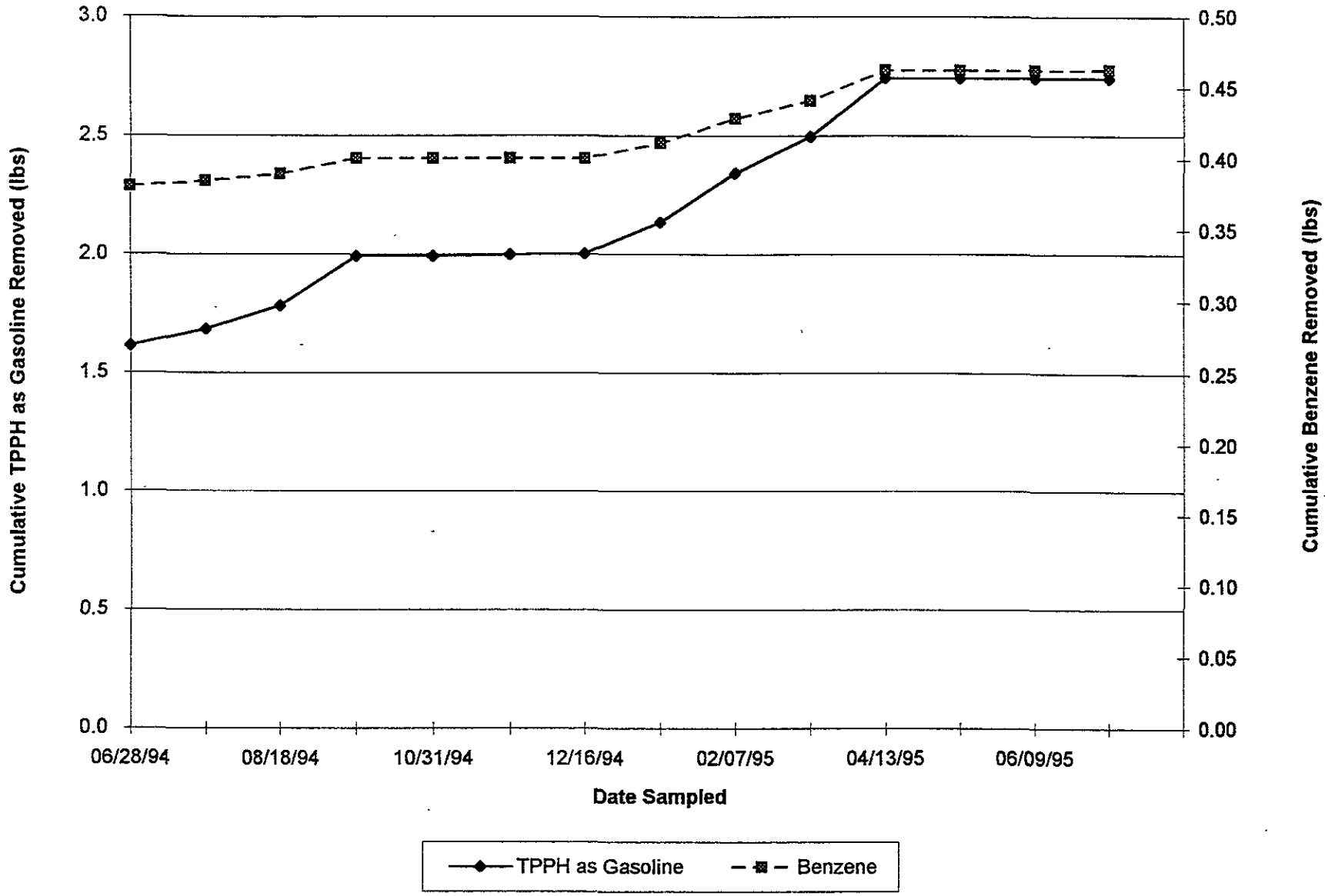
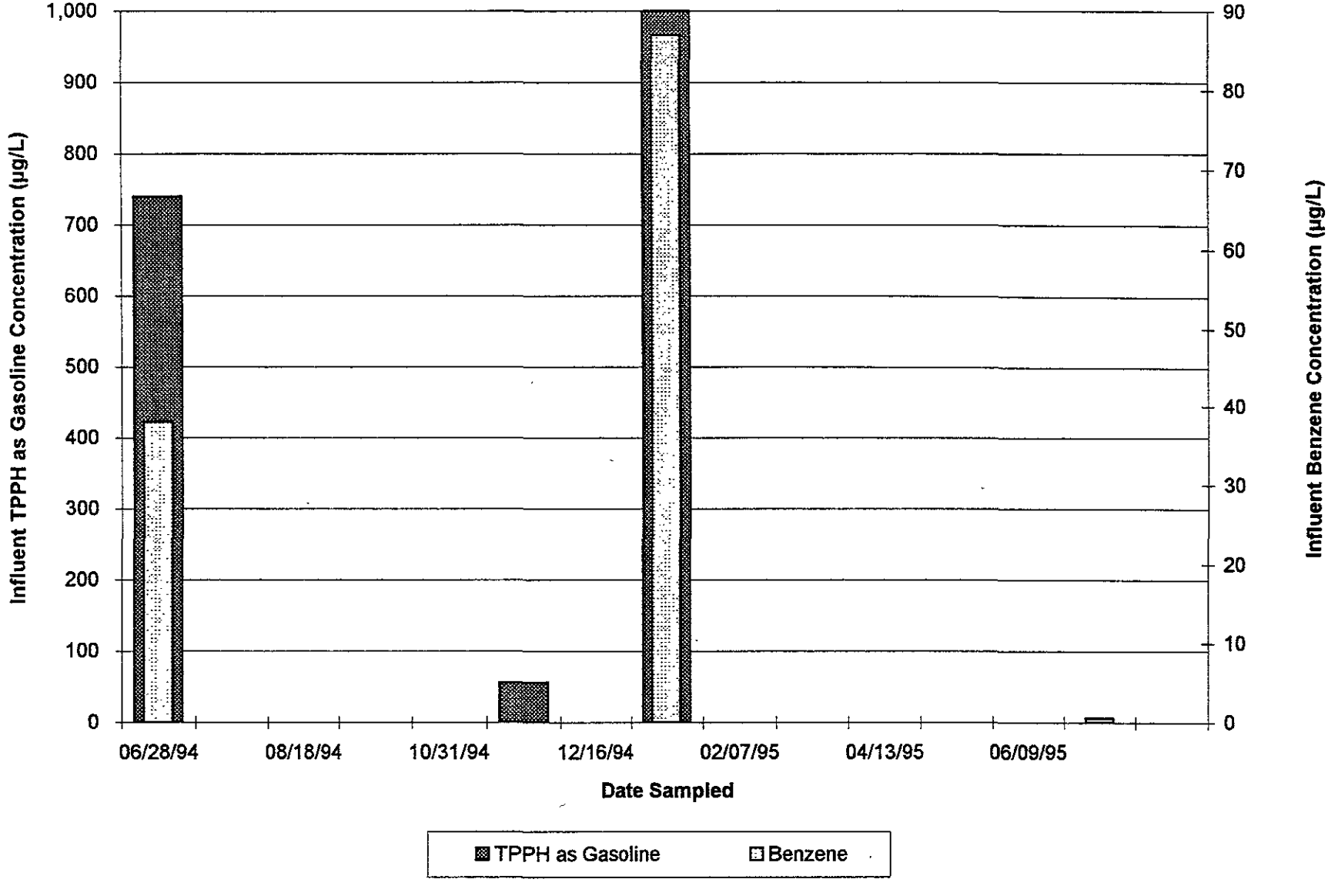


Figure 4
Groundwater Extraction System Hydrocarbon Concentrations

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



ATTACHMENT A

FIELD AND LABORATORY PROCEDURES

ATTACHMENT A
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, and xylenes. The analyses were performed according to EPA Methods 8015 (modified), 8020, and 5030 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 B.

ATTACHMENT B

CERTIFIED ANALYTICAL REPORTS, 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: Maree Dodén

Project: 330-109.2G/4931,Oakland

Enclosed are the results from samples received at Sequoia Analytical on November 6, 1995. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE COLLECTED	TEST METHOD
9511366 -01	LIQUID, A-2	11/03/95	TPHGBW Purgeable TPH/BTEX
9511366 -02	LIQUID, A-3	11/03/95	TPGBMW Purgeable TPH/BTEX
9511366 -03	LIQUID, A-4	11/03/95	TPHGBW Purgeable TPH/BTEX
9511366 -04	LIQUID, A-5	11/03/95	TPGBMW Purgeable TPH/BTEX
9511366 -05	LIQUID, A-6	11/03/95	TPHGBW Purgeable TPH/BTEX
9511366 -06	LIQUID, A-11	11/03/95	TPGBMW Purgeable TPH/BTEX
9511366 -07	LIQUID, A-12	11/03/95	TPGBMW Purgeable TPH/BTEX
9511366 -08	LIQUID, AR-1	11/03/95	TPHGBW Purgeable TPH/BTEX
9511366 -09	LIQUID, AR-2	11/03/95	TPHGBW Purgeable TPH/BTEX
9511366 -10	LIQUID, AR-3	11/03/95	TPHGBW Purgeable TPH/BTEX
9511366 -11	LIQUID, TB	11/03/95	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

B Fletcher

Brucie Fletcher
Project Manager

Kri Fall

Quality Assurance Department

Sequoia Analytical

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

Attention: Maree Doden

Client Proj. ID: 330-109.2G/4931,Oakland
Sample Descript: A-2
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9511366-01

Sampled: 11/03/95
Received: 11/06/95

Analyzed: 11/07/95
Reported: 11/17/95

QC Batch Number: 5G110795BTEX03A
Instrument ID: GCHP03

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.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	103

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

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

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Pacific Environmental Group	Client Proj. ID: 330-109.2G/4931,Oakland	Sampled: 11/03/95
2025 Gateway Place, Suite 440	Sample Descript: A-3	Received: 11/06/95
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 11/07/95
Attention: Maree Doden	Lab Number: 9511366-02	Reported: 11/17/95

QC Batch Number: 5G110795BTEX21A
Instrument ID: GCHP21

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Methyl t-Butyl Ether	2.5	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		

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

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

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

Attention: Maree Doden

Client Proj. ID: 330-109.2G/4931,Oakland
Sample Descript: A-4
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9511366-03

Sampled: 11/03/95
Received: 11/06/95

Analyzed: 11/07/95
Reported: 11/17/95

QC Batch Number: 5G110795BTEX21A
Instrument ID: GCHP21

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	**50**	**1200**
Benzene	**0.50**	**22**
Toluene	0.50	N.D.
Ethyl Benzene	**0.50**	**6.4**
Xylenes (Total)	**0.50**	**3.7**
Chromatogram Pattern:		**Gas**

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	110

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

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

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

Attention: Maree Doden

Client Proj. ID: 330-109.2G/4931,Oakland
Sample Descript: A-5
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9511366-04

Sampled: 11/03/95
Received: 11/06/95

Analyzed: 11/07/95
Reported: 11/17/95

QC Batch Number: 5G110795BTEX20A
Instrument ID: GCHP20

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Methyl t-Butyl Ether	2.5	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	103

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

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Proj. ID: 330-109.2G/4931,Oakland	Sampled: 11/03/95
2025 Gateway Place, Suite 440	Sample Descript: A-6	Received: 11/06/95
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 11/07/95
Attention: Maree Doden	Lab Number: 9511366-05	Reported: 11/17/95

QC Batch Number: 5G110795BTEX20A
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.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	103

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

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

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

Attention: Maree Doden

Client Proj. ID: 330-109.2G/4931,Oakland
Sample Descript: A-11
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9511366-06

Sampled: 11/03/95
Received: 11/06/95

Analyzed: 11/07/95
Reported: 11/17/95

QC Batch Number: 5G110795BTEX20A
Instrument ID: GCHP20

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Methyl t-Butyl Ether	2.5	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	99

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

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
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: 330-109.2G/4931,Oakland	Sampled: 11/03/95
2025 Gateway Place, Suite 440	Sample Descript: A-12	Received: 11/06/95
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 11/07/95
Attention: Maree Doden	Lab Number: 9511366-07	Reported: 11/17/95

QC Batch Number: 5G110795BTEX20A
Instrument ID: GCHP20

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Methyl t-Butyl Ether	2.5	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	95

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

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

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

Attention: Maree Doden

Client Proj. ID: 330-109.2G/4931,Oakland
Sample Descript: AR-1
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9511366-08

Sampled: 11/03/95
Received: 11/06/95

Analyzed: 11/07/95
Reported: 11/17/95

QC Batch Number: 5G110795BTEX20A
Instrument ID: GCHP20

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	500	7400
Benzene	5.0	130
Toluene	5.0	41
Ethyl Benzene	5.0	18
Xylenes (Total)	5.0	370
Chromatogram Pattern:		Gas

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	126

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

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

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Pacific Environmental Group	Client Proj. ID: 330-109.2G/4931,Oakland	Sampled: 11/03/95
2025 Gateway Place, Suite 440	Sample Descript: AR-2	Received: 11/06/95
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 11/07/95
Attention: Maree Doden	Lab Number: 9511366-09	Reported: 11/17/95

QC Batch Number: 5G110795BTEX20A
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.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	86

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

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110

Attention: Maree Doden

Client Proj. ID: 330-109.2G/4931,Oakland
Sample Descript: AR-3
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9511366-10

Sampled: 11/03/95
Received: 11/06/95

Analyzed: 11/07/95
Reported: 11/17/95

QC Batch Number: 5G110795BTEX20A
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.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	90

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

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

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

Attention: Maree Doden

Client Proj. ID: 330-109.2G/4931,Oakland
Sample Descript: TB
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9511366-11

Sampled: 11/03/95
Received: 11/06/95

Analyzed: 11/07/95
Reported: 11/17/95

QC Batch Number: 5G110795BTEX21A
Instrument ID: GCHP21

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.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	90

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

SEQUOIA ANALYTICAL - ELAP #1210

B Fletcher

Brucie Fletcher
Project Manager

Sequoia Analytical

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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Maree Doden

Client Project ID: 330-109.2G/4931, Oakland
Matrix: LIQUID
Work Order #: 9511366 01

Reported: Nov 17, 1995

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC110795BTEX03A	GC110795BTEX03A	GC110795BTEX03A	GC110795BTEX03A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	J. Woo	J. Woo	J. Woo	J. Woo
MS/MSD #:	9510L3207	9510L3207	9510L3207	9510L3207
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	11/7/95	11/7/95	11/7/95	11/7/95
Analyzed Date:	11/7/95	11/7/95	11/7/95	11/7/95
Instrument I.D.#:	GCHP3	GCHP3	GCHP3	GCHP3
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µgL
Result:	9.7	9.7	9.6	29
MS % Recovery:	97	97	96	97
Dup. Result:	11	11	11	32
MSD % Recov.:	110	110	110	107
RPD:	13	13	14	9.8
RPD Limit:	0-50	0-50	0-50	0-50
LCS #:	BLK102795	BLK102795	BLK102795	BLK102795
Prepared Date:	11/7/95	11/7/95	11/7/95	11/7/95
Analyzed Date:	11/7/95	11/7/95	11/7/95	11/7/95
Instrument I.D.#:	GCHP3	GCHP3	GCHP3	GCHP3
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µgL
LCS Result:	10	10	10	31
LCS % Recov.:	100	100	100	103
MS/MSD LCS Control Limits	71-133	72-128	72-130	71-120

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

SEQUOIA ANALYTICAL

B Fletcher

Brucie Fletcher
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: Maree Doden

Client Project ID: 330-109.2G/4931, Oakland
Matrix: LIQUID
Work Order #: 9511366 01

Reported: Nov 17, 1995

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC110795BTEX21A	GC110795BTEX21A	GC110795BTEX21A	GC110795BTEX21A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	J. Woo	J. Woo	J. Woo	J. Woo
MS/MSD #:	9510L3207	9510L3207	9510L3207	9510L3207
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	11/7/95	11/7/95	11/7/95	11/7/95
Analyzed Date:	11/7/95	11/7/95	11/7/95	11/7/95
Instrument I.D.#:	GCHP21	GCHP21	GCHP21	GCHP21
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µgL
Result:	9.9	9.8	9.5	27
MS % Recovery:	99	98	95	90
Dup. Result:	10	11	10	31
MSD % Recov.:	100	110	100	103
RPD:	1.0	12	5.1	14
RPD Limit:	0-50	0-50	0-50	0-50
LCS #:	BLK102695	BLK102695	BLK102695	BLK102695
Prepared Date:	11/7/95	11/7/95	11/7/95	11/7/95
Analyzed Date:	11/7/95	11/7/95	11/7/95	11/7/95
Instrument I.D.#:	GCHP21	GCHP21	GCHP21	GCHP21
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µgL
LCS Result:	9.1	8.8	8.6	26
LCS % Recov.:	91	88	86	87
MS/MSD LCS Control Limits	71-133	72-128	72-130	71-120

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

SEQUOIA ANALYTICAL

Brucie Fletcher
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: Maree Doden

Client Project ID: 330-109.2G/4931, Oakland
Matrix: LIQUID
Work Order #: 9511366 04-10

Reported: Nov 17, 1995

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC110795BTEX20A	GC110795BTEX20A	GC110795BTEX20A	GC110795BTEX20A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	J. Woo	J. Woo	J. Woo	J. Woo
MS/MSD #:	9510L3207	9510L3207	9510L3207	9510L3207
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	11/7/95	11/7/95	11/7/95	11/7/95
Analyzed Date:	11/7/95	11/7/95	11/7/95	11/7/95
Instrument I.D.#:	GCHP20	GCHP20	GCHP20	GCHP20
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µgL
Result:	10	10	10	30
MS % Recovery:	100	100	100	100
Dup. Result:	10	10	10	29
MSD % Recov.:	100	100	100	97
RPD:	0.0	0.0	0.0	3.4
RPD Limit:	0-50	0-50	0-50	0-50
LCS #:	BLK102795	BLK102795	BLK102795	BLK102795
Prepared Date:	11/7/95	11/7/95	11/7/95	11/7/95
Analyzed Date:	11/7/95	11/7/95	11/7/95	11/7/95
Instrument I.D.#:	GCHP20	GCHP20	GCHP20	GCHP20
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µgL
LCS Result:	9.5	9.5	9.6	28
LCS % Recov.:	95	95	96	93
MS/MSD LCS Control Limits	71-133	72-128	72-130	71-120

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

SEQUOIA ANALYTICAL

B Fletcher

Brucie Fletcher
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: PEG / ARCO
REC. BY (PRINT): TONY MCMAHON

WORKORDER: 9511366
DATE OF LOG-IN: 11/06/95

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: 11-6-95
12. Temp. Rec. at Lab: 12° C
13. Time Rec. at Lab: 11:09

LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION(ETC.)
01	A-C	A-2	Vox (3)	H2O	11/3/95	
02	↓	A-3	(3)			
03	↓	A-4	(3)			
04	A-D	A-5	(4)			
05	A-C	A-6	(3)			
06	A-D	A-11	(4)			
07	↓	AR-12	(4)			
08	A-C	AR-1	(3)			
09	↓	-2	(3)			
10	↓	-3	(3)			
11	A,B	TB-1	(2)	↓	↓	

Tony McMahon 11/6/95

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

ARCO Products Company
Division of AtlanticRichfieldCompany

330-109.2G **Task Order No.** 1707600

Chain of Custody

ARCO Facility no. 4931 | City (Facility) 731 MacArthur 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) 441-9102 | Contract number 1707600

Consultant name Pacific Environmental Group | Address (Consultant) 2025 Gateway Pl #440 San Jose, CA

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 ☐ VOA ☐ Semi VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	MTBE
A-2	01 A-C	3		✓			HCL	11-3-95	1045		✓										
A-3	02	3		✓			↓	↓	1050		✓										✓
A-4	03 ↓	3		✓					1012		✓										
A-5	04 A-D	4		✓					940		✓										✓
A-6	05 A-C	3		✓					927		✓										
A-11	06 A-D	4		✓					9:00		✓										✓
A-12	07 ↓	4		✓					8:50		✓										✓
AR-1	08 A-C	3		✓					10:10		✓										
AR-2	09	3		✓					10:40		✓										
AR-3	10 ↓	3		✓					11:25		✓										
TB-1	11 AB	2		✓			↓	↓	—		✓										

Method of shipment

Special detection Limit/reporting

Special QA/QC

Remarks
9511366

Lab number

Condition of sample:

Temperature received:

	Date	Time		Date	Time
Relinquished by sampler [signature]	11-3-95	1500	Received by N. Doden	11/3/95	1500
Relinquished by N. Doden	11/6/95	10:30 Am	Received by S. Ross	11-6-95	10:30 Am
Relinquished by S. Ross	11-6-95	11:10 AM	Received by laboratory Tony McMahon	11-6-95	11:09

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

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

Sequoia Analytical

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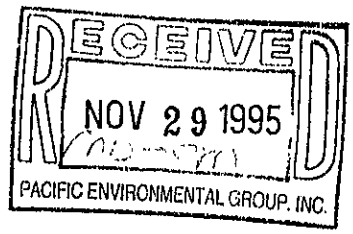
JR 12/5



Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Maree Doden

Project: 330-109.2B/4931,Oakland

Enclosed are the results from samples received at Sequoia Analytical on November 17, 1995. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE COLLECTED	TEST METHOD
9511D44 -01	LIQUID, A-9	11/17/95	Nitrite as Nitrite
9511D44 -01	LIQUID, A-9	11/17/95	Nitrate as Nitrate

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

Brucie Fletcher
Project Manager

Quality Assurance Department

Sequoia Analytical

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

Attention: Maree Doden

Client Proj. ID: 330-109.2B/4931,Oakland

Lab Proj. ID: 9511D44

Sampled: 11/17/95
Received: 11/17/95
Analyzed: see below

Reported: 11/28/95

LABORATORY ANALYSIS

Analyte	Units	Date Analyzed	Detection Limit	Sample Results
Lab No: 9511D44-01				
Sample Desc : **LIQUID,A-9**				
Nitrate as Nitrate	**mg/L**	**11/21/95**	**1.0**	**22**
Nitrite as Nitrite	mg/L	11/21/95	1.0	N.D.

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

SEQUOIA ANALYTICAL - ELAP #1210

Brucie Fletcher
Project Manager

Sequoia Analytical

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San Jose, CA 95110
Attention: Maree Doden

Client Proj. ID: 330-109.2B/4931,Oakland
Lab Proj. ID: 9511D44

Received: 11/17/95
Reported: 11/28/95

LABORATORY NARRATIVE

Please note:

Sulfuric acid was added to the samples upon arrival at the lab. Sulfuric acid is used as a preservative for the nitrate/nitrite analysis to extend the hold time to 28 days.

SEQUOIA ANALYTICAL

B Fletcher

Brucie Fletcher
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
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Maree Doden

Client Project ID: 330-109.2B/4931, Oakland
Matrix: LIQUID
Work Order #: 9511D44 01

Reported: Nov 27, 1995

QUALITY CONTROL DATA REPORT

Analyte:	Nitrite	Nitrate
QC Batch#:	IN1121953000ACB	IN1121953000ACB
Analy. Method:	EPA 300.0	EPA 300.0
Prep. Method:	N.A.	N.A.
Analyst:	G. Fish	G. Fish
MS/MSD #:	9511E5807	9511E5807
Sample Conc.:	N.D.	66
Prepared Date:	11/21/95	11/21/95
Analyzed Date:	11/21/95	11/21/95
Instrument I.D.#:	INIC1	INIC1
Conc. Spiked:	10 mg/L	10 mg/L
Result:	8.9	75
MS % Recovery:	89	90
Dup. Result:	9.0	74
MSD % Recov.:	90	80
RPD:	2.1	2.3
RPD Limit:	0-30	0-30
LCS #:	LCS112195	LCS112195
Prepared Date:	11/21/95	11/21/95
Analyzed Date:	11/21/95	11/21/95
Instrument I.D.#:	INIC1	INIC1
Conc. Spiked:	5.0 mg/L	10 mg/L
LCS Result:	4.6	10
LCS % Recov.:	92	100

MS/MSD	70-130	70-130
LCS	90-110	90-110
Control Limits		

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

SEQUOIA ANALYTICAL

B Fletcher

Brucie Fletcher
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: PEG / Arco
REC. BY (PRINT): RI

WORKORDER: 9511D94
DATE OF LOG-IN: 11/17/95

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: 11/17/95
12. Temp. Rec. at Lab: 19°C
13. Time Rec. at Lab: 1530

LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION(ETC.)
01	A,B	A-9	2 VOA	Liq	11/17/95	

11/17/95

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

ARCO Products Company Division of AtlanticRichfieldCompany — 330-109.2B **Task Order No.** 07600 17037-00 — **Chain of Custody**

ARCO Facility no. 4931	City (Facility) Oakland	Project manager (Consultant) Shaw Garakani	Laboratory name Segura
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 441-7500	Fax no. (Consultant) 441-7539
Consultant name Pacific Environmental Group	Address (Consultant) 2025 Gateway Pl. #440 San Jose Ca. 95110		Contract number 07-073

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☐ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐	Nitrites	Nitrates
A-9	01			X		yes	NP	11-17-95	11:40												X	X
A-9				↓		↓	↓															

Special detection Limit/reporting

Special QA/QC

Remarks

pH = 4

Lab number 9511D44

Turnaround time

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

Method of shipment

Condition of sample:		Temperature received:	11/17/95 13:41
Relinquished by sampler	Date 11-17-95 Time 1:41	Received by	11-17-95 2:20
Relinquished by	Date 11/17/95 Time 1420	Received by	11-17-95 2:20
Relinquished by	Date 11-17-95 Time 1530	Received by laboratory	Date 11/17/95 Time 1530

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

FIELD REPORT

PTH TO WATER/SEPARATE-PHASE HYDROCARBON SURVEY

PROJECT No.: 330-109,2 LOCATION: 731 West MacArthur DATE: 11-3-95

CLIENT/STATION NO.: 4931 FIELD TECHNICIAN: Chuck Graves DAY OF WEEK: Friday

PROBE TYPE/ID No.
- [x] Oil/Water IF/ _____
- [x] H_2O level indicator _____
- [ ] Other: _____

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
4"	A-2	8:01	✓	✓	✓	✓	✓		10.60 / 10.60	10.92 / 10.92											
4"	A-3	8:00	✓	✓	✓	✓	✓		~~10.35~~ 9.33 / ~~10.26~~ 9.35	0 10.26 / 10.26											
4"	A-4	8:08	✓	✓	✓	✓	✓		9.90 / 9.90	10.42 / 10.42											
3"	A-5	8:07	✓	✓	✓	✓	✓		9.36 / 9.34	10.00 / 10.00											
3"	A-6	8:04	✓	✓	✓	✓	✓		8.97 / 8.97	9.64 / 9.64											
3"	A-8	8:10	✓	✓	✓	✓	✓		9.00 / 9.00	9.60 / 9.60	9.69 / 8.99	.01		✓		✓			✓ Dark Brown	0	0
6"	A-9	8:13	✓	✓	✓	✓	–		8.39 / 8.39	9.00 / 9.00											
3"	A-10	8:18	✓	✓	✓	✓	✓		9.83 / 9.83	10.28 / 10.28											
3"	A-11	8:52	✓	✓	✓	✓	✓		9.95 / 9.95	10.10 / 10.10											

Comments: A-4 has Loose coupling @ Top of Casing

A-9 EXTRACTION well is off.

FIELD REPORT

PTH TO WATER/SEPARATE-PHASE HYDROCARBON SURVEY

PROJECT No.: 330-109.26 LOCATION: 731 MacArthur Blvd. DATE: 11-3-95

CLIENT/STATION NO.: 4931 FIELD TECHNICIAN: C. GRAVES DAY OF WEEK: FRIDAY

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

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"	A-12	8:29	✓	✓	✓	✓	✓		8.54 / 8.54	9.10 / 9.10										
6"	AR-1	8:10	✓	✓	✓	✓	✓		9.85 / 9.85	10.32 / 10.32										
6"	AR-2	8:55	✓	✓	✓	✓	✓		9.33 / 9.33	10.27 / 10.27										
6"	AR-3	8:16	✓	✓	✓	✓	✓		9.40 / 9.40	10.05 / 10.05										
3"	A-7	8:05	✓	✓	✓	✓	✓		8.78 / 8.78	9.25 / 9.25										
									/	/										
									/	/										
									/	/										
									/	/										

Comments: _____

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-109.2G LOCATION: 731 MacArthur Blvd. OAKLAND WELL ID #: A-2

CLIENT/STATION No.: 4931 FIELD TECHNICIAN: Chuck Graves, Sonny P.

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ 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 20.00 - DTW 10.60 = 9.40 x Gal/Linear Foot 0.66 = 6.20 x Number of Casings 3 = Calculated Purge 18.61

DATE PURGED: 11-3-95 START: 10:35 END (2400 hr): 10:37 PURGED BY: CG, SP

DATE SAMPLED: 11-3-95 START: 1045 END (2400 hr): ~ SAMPLED BY: CG, SP

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
10:37	6.5	6.94	378	68.9	Brown	MOD	NO
	~~13.0~~		Dry @ 6.5 Gallons				
	~~19.5~~						

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				COLOR	TURBIDITY	ODOR
15.40	TOB/(TOC)	6.83	641	70.3	BROWN	MOD	NO

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

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: 29-10
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-2	11/3	1045	3	40ml	VOA	HCL	GAS, BTKE

REMARKS: _____

all N.A. CA

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-109.26 LOCATION: 731 MacArthur WELL ID #: A-3

CLIENT/STATION No.: 4931 FIELD TECHNICIAN: Chuck Graves

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ 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 17.00 - DTW 9.33 = 7.67 x Gal/Linear Foot 0.66 = 5.06 x Number of Casings 3 = Calculated Purge 15.18

DATE PURGED: 11-3-95 START: 10:31 END (2400 hr): 10:32 PURGED BY: CG, SP

DATE SAMPLED: 11-3-95 START: 10:50 END (2400 hr): — SAMPLED BY: CG, SP

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 2 5°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
10:32	5.25	6.56	681	68.6	BROWN	MOD	NO
	~~10.5~~		DRY @	5.00 GALLONS			
	~~15.75~~						

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: 19.35	TOB/TOC	6.90	403	69.2	BROWN	HEAVY	NO

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

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: 29-9
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-3	11-3-95	1050	4	40ml	VOA	HCL	GAS, BTXE, MTBE

REMARKS: _____

All Plan in

PACIFIC

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-109.26 LOCATION: 731 MacArthur Oakland WELL ID #: A-4

CLIENT/STATION No.: 4931 FIELD TECHNICIAN: Chuck Grame, Sonny P.

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ 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 20.00 - DTW 9.90 = 10.10 x Gal/Linear Foot .66 = 6.66 x Number of Casings 3 = Calculated Purge 19.99

DATE PURGED: 11-3-95 START: 9:55 END (2400 hr): 10:03 PURGED BY: CG, SP

DATE SAMPLED: 11-3-95 START: 10:12 END (2400 hr): 10:12 SAMPLED BY: CG, SP

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
10:00	7	6.51	920	66.7	Brown	Heavy	Mod
10:03	~~10~~ 10	6.61	987	69.3	Brown	Heavy	Mod
	~~2T~~		Dry @ 10.0 GALLONS				

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				COLOR	TURBIDITY	ODOR
13.83	TOC	6.64	978	69.7	Brown	MOD	MOD

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

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: 29-7
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-4	11/3	10:12	3	40ml	VOA	HCl	GAS/BTXE

REMARKS: Slight sheen noted.

11/6/95

PACIFIC

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-109.26 LOCATION: 731 MacArthur blvd OAKLAND WELL ID #: A-5

CLIENT/STATION No.: 4931 FIELD TECHNICIAN: Chuck Graves

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ 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 24.50 - DTW 9.36 = 15.14 x Gal/Linear Foot 0.38 = 5.75 x Number of Casings 3 = Calculated Purge 17.25

DATE PURGED: 11-3-95 START: 9:32 END (2400 hr): 936 PURGED BY: CG, SP

DATE SAMPLED: 11-3-95 START: 940 END (2400 hr): — SAMPLED BY: CG, SP

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 2 5°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
933	6	6.86	561	67.7	BROWN	HEAVY	NO
935	12	6.86	566	68.7	BROWN	HEAVY	NO
	~~+8~~		DRY @ 15.00				

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						
10.24	TOC	6.94	539	68.1	BROWN	HEAVY	NO

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

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: 29-5
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-5	11/3	940	4	40ml	VOA	HCl	GAS, BTXE, MTBE

REMARKS: _____

N.D. 6m 91

PACIFIC

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-109.26 LOCATION: 731 MacArthur Oakland WELL ID #: A-6

CLIENT/STATION No.: 4931 FIELD TECHNICIAN: Chuck Graves

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ 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 25.50 - DTW 8.97 = 16.53 x Gal/Linear Foot .38 = 6.28 x Number of Casings 3 = Calculated Purge 18.84

DATE PURGED: 11-3-95 START: 9:19 END (2400 hr): 9:22 PURGED BY: CG

DATE SAMPLED: 11-3-95 START: 9:27 END (2400 hr): — SAMPLED BY: CG

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
9:20	6.5	7.06	467	65.0	Brown	Heavy	NO
9:22	13.0	6.89	474	66.5	Brown	Heavy	NO
	~~19.0~~		Dry @ 15.0 gallons				

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				COLOR	TURBIDITY	ODOR
13.95	(TOC)	6.97	476	66.7	Brown	Heavy	NO

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

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: 29-4
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-6	11-3-95	9:27	3	40ml	VOA	HCl	GAS, BTXE

REMARKS: _____

SIGNATURE: Chuck Graves

PACIFIC

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-109.26 LOCATION: 731 MacArthur Blvd OAKLAND WELL ID #: A-7

CLIENT/STATION No.: 4931 FIELD TECHNICIAN: Chuck Graves

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ 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 22.28 - DTW 8.78 = 13.50 x Gal/Linear Foot 0.38 = 5.13 x Number of Casings 3 = Calculated Purge 15.39

DATE PURGED: 11-3-95 START: 9:09 END (2400 hr): 9:11 PURGED BY: CG, SP

DATE SAMPLED: 11-3-95 START: 915 END (2400 hr): — SAMPLED BY: CG, SP

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
9:10	5.25	7.03	481	67.1	Brown	7200	NO
9:11	10.50	6.92	490	68.5	Brown	>200	no
	~~15.75~~		Dry @	11.0 GAL			

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

Pumped dry (Yes) / No

FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW	TOB (TOC)		E.C.	TEMPERATURE	COLOR	TURBIDITY	ODOR
15.45	TOC	6.91	498	68.7	Brown	7200	no

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

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: 29-
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-7	11/3	915	3	40ml	VOA	HCl	GAS, BTXE

REMARKS: _____

PACIFIC

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No. : 330-109.2G LOCATION: 731 MacArthur Blvd Oakland WELL ID #: A-8

CLIENT/STATION No.: FIELD TECHNICIAN: Chuck Graves

WELL INFORMATION

Depth to Liquid: ______ TOB ______ TOC
Depth to water: ______ TOB ______ TOC
Total depth: ______ TOB ______ TOC
Date: ______ 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: ______ START: ______ END (2400 hr): ______ PURGED BY: ______

DATE SAMPLED: ______ START: ______ END (2400 hr): ______ SAMPLED BY: ______

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 2 5°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
			SPH IN	WELL			
					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

REMARKS: NO Sample
.01 ft SPH IN well

[illegible]

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-109.26 LOCATION: 731 MacArthur Blvd Oakland WELL ID #: A-9

CLIENT/STATION No.: 4931 FIELD TECHNICIAN: Chuck Grace, Sonny P.

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ 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 19.00 - DTW 8.39 = 10.61 x Gal/Linear Foot 1.5 = 15.92 x Number of Casings 3 = Calculated Purge 47.76

DATE PURGED: 11-3-95 START: _____ END (2400 hr): _____ PURGED BY: CG

DATE SAMPLED: 11-3-95 START: _____ END (2400 hr): _____ SAMPLED BY: CG

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 2 5°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
			EXTRACTION well				
			would NOT Run				

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: 29-11
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-9	11/3		3	40ml	VOA	HCL	GAS, BTXE

REMARKS: NO Sample

11.6.95

PACIFIC

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-109.26 LOCATION: 731 MacArthur blvd WELL ID #: A-11

CLIENT/STATION No.: 4931 FIELD TECHNICIAN: Chuck Graves

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ 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 28.00 - DTW 9.95 = 18.05 x Gal/Linear Foot 0.38 = 6.86 x Number of Casings 3 = Calculated Purge 20.51

DATE PURGED: 11-3-95 START: 852 END (2400 hr): 859 PURGED BY: CG, SP

DATE SAMPLED: 11-3-95 START: 900 END (2400 hr): — SAMPLED BY: CG, SP

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
855	7	6.93	498	65.5	Brown	>200	NO
857	14	6.80	505	66.6	Clear	Trace	NO
859	21	6.73	502	66.5	Clear	Trace	NO

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: 29-2
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-11	11/3	900	4	40ml	VOA	HCl	GAS, BTEX

REMARKS: _____

PACIFIC

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-109.26 LOCATION: 731 MacArthur Blvd. Oakland WELL ID #: A-12

CLIENT/STATION No.: 4931 FIELD TECHNICIAN: Chuck Graves

WELL INFORMATION

Depth to Liquid: ______ TOB ______ TOC
Depth to water: ______ TOB ______ TOC
Total depth: ______ TOB ______ TOC
Date: ______ 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 30.00 - DTW 8.54 = 21.46 x Gal/Linear Foot 0.38 = 8.15 x Number of Casings 3 = Calculated Purge 24.46

DATE PURGED: 11-3-95 START: 8:34 END (2400 hr): 845 PURGED BY: CG

DATE SAMPLED: 11-3-95 START: 8:50 END (2400 hr): —— SAMPLED BY: CG

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
8:38	8.25	6.51	529	68.0	Brown	>200	NO
8:43	16.50	6.74	523	68.0	Clear	Trace	NO
8:45	24.75	6.68	516	67.0	Clear	Trace	NO

Pumped dry Yes / No (circled: 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

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

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: 29-1
- ☐ Dedicated: ______
- ☐ Other: ______

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
A-12	11-3-95	850	3	40ml	VOA	HCL	GAS, BTEX

REMARKS:

ol Vh1 91

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-109.26 LOCATION: 731 MacArthur blvd Oakland WELL ID #: AR-1

CLIENT/STATION No.: 4931 FIELD TECHNICIAN: Chuck Graves

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ 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 31.5 - DTW 9.85 = 21.65 x Gal/Linear Foot 1.5 = 32.48 x Number of Casings 3 = Calculated Purge 97.44

DATE PURGED: 11-3-95 START: 10:00 END (2400 hr): 10:04 PURGED BY: CG

DATE SAMPLED: 11-3-95 START: 10:10 END (2400 hr): 10:10 SAMPLED BY: CG

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (µmhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
			DRY @ 30.00 GALLONS				

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)	pH	E.C.	TEMPERATURE	COLOR	TURBIDITY	ODOR
25.26	(TOC)	7.23	585	68.7	BROWN	MOD	MOD

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

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: 29-8
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
AR-1	11/3	10:10	3	40ml	VOA	HCL	GAS, BTXE

REMARKS: RAN EXTRACTION well until DRY.

Ch. Lm 97

PACIFIC

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-101.26 LOCATION: 731 MacArthur OAKLAND WELL ID #: AR-2

CLIENT/STATION No.: 4931 FIELD TECHNICIAN: Chuck Graves

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ 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 27.5 - DTW 9.33 = 18.17 x Gal/Linear Foot 1.5 = 27.25 x Number of Casings 3 = Calculated Purge 81.76

DATE PURGED: 11-3-95 START: 1026 END (2400 hr): 1028 PURGED BY: CG

DATE SAMPLED: 11-3-95 START: 1040 END (2400 hr): 1040 SAMPLED BY: CG

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
			DRY @ 33.00 Gallons				

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				COLOR	TURBIDITY	ODOR
21.25	TOB/(TOC)	6.86	495	68.6	Clear	Trace	NO

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

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: 29-8
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
AR-2	11-3-95	1040	3	40ml	VOA	HCL	GAS, BTEX

REMARKS: _____

11 11 01.. 4

PACIFIC

FIELD DATA SHEET

WATER SAMPLE FIELD DATA SHEET

PROJECT No.: 330-109.26 LOCATION: 731 MacArthur Oakland WELL ID #: AR-3

CLIENT/STATION No.: 4931 FIELD TECHNICIAN: Chuck Graves, Sonny P.

WELL INFORMATION

Depth to Liquid: _____ TOB _____ TOC
Depth to water: _____ TOB _____ TOC
Total depth: _____ TOB _____ TOC
Date: _____ 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 27.00 - DTW 9.40 = 17.60 x Gal/Linear Foot 1.5 = 26.40 x Number of Casings 3 = Calculated Purge 79.20

DATE PURGED: 11-3-95 START: 11:00 END (2400 hr): 11:04 PURGED BY: CG

DATE SAMPLED: 11-3-95 START: 1125 END (2400 hr): 11:25 SAMPLED BY: CG

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (° F)	COLOR	TURBIDITY	ODOR
			Dry @ 26 gallon				

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)	pH	E.C.	TEMPERATURE	COLOR	TURBIDITY	ODOR
9.42	(TOC)	7.31	481	71.6	Clear	Trace	NO

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

SAMPLING EQUIPMENT/I.D. #
- ☒ Bailer: 29-12
- ☐ Dedicated: _____
- ☐ Other: _____

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
AR-3	11/3	1125	3	40ml	VOA	HCL	GAS, BTXE

REMARKS: _____

PACIFIC

FIELD SERVICES / O&M REQUEST

Work Order # 5034

11/17 Schedule RY

SITE INFORMATION FORM

Identification	Project Type	
Project # 330-109.2E	☐ 1st Time Visit	Client P.O.C.:
Station # 4931	☐ Quarterly	Date of Request
Site Address: 731 WEST MACARTHUR BLVD. AT WEST STREET	☐ 1st ☐ 2nd ☐ 3rd ☐ 4th	Ideal field date(s):
County:	☐ Monthly	
Project Manager: S.G.	☐ Semi-Monthly	**Check Appropriate Category**
Requestor: D.N.	☐ Weekly	Budget Hrs.
Client: ARCO	☐ One time event	Actual Hrs. 3.0 ~~4.0~~ (JP)
	☑ Other: w/ 330084 SB EVENT	Mob de Mob 1.0

	Initials	Date
F/S	RY	11/21/95
Copy/Dist.	RY	↓

Field Tasks: For General Description

circle one:
Priority: 1. (emergency, must be done within 24 hrs); 2. (next visit); 3. (when available)

OBJECTIVE; REMOVE PUMP FROM WELL A-9, INSTALL ORC'S.

PROCEDURE; PLEASE REMOVE EXISTING GWE PUMP FROM WELL A-9 (YOU WILL NEED A TRUCK WITH THE ELECTRIC WINCH) STEAM CLEAN PUMP AND ELECTRICAL CORDS AND STORE ON-SITE IN REMEDIATION COMPOUND. COVER WITH PLASTIC SO IT CAN NOT BE IDENTIFIED BY SOMEONE LOOKING INTO COMPOUND. OBTAIN FROM WELL A-9, A D.O. METER READING, ~~&~~ SAMPLE FOR NITRATE AND NITRITE, TEMP, CONDUCTIVITY AND PH. (REFER TO DATA SHEET, ATTACHED)
- INSTALL IN WELL A STRAND OF 8 4" ORC SOCKS PER ATTACHED INSTRUCTIONS AFTER OBTAINING BASELINE DATA. SUSPEND SOCKS SO TOP SOCK IS @ 6" ABOVE WATER. SECURE TO WELL CAP WITH A HEAVY DUTY EYE HOOK. (3/8" DIAM × 6" LONG)

* REMEMBER TO PUT GREEN STIFFINING SLEEVE OVER ORC'S. *

Comments, remarks, etc. from Field Staff (include problems encountered and out-of-scope work)

Samples Taken Task completed

☐ Samples taken ☐ Samples not required ☐ Soil Vapor ☐ Groundwater

☐ Weekly ☐ Semi-Monthly ☐ Monthly ☐ Quarterly ☐ Semi-Annual

PACIIFIC ENVIRONMENTAL GROUP, INC.

Completed by: [signature] Date: 11-17-95

Checked by:

DATE: 11-17-95 TECHNICIAN JPERFUMO

Groundwater Bioaugmentation System
ARCO Service Station 4931
731 West MacArthur Blvd.
330-109.5B
November 7, 1995

SYSTEM DESCRIPTION:

ORC Wells

Well	Size	Number	Set Depth (TOB)
A-9	6 "well/4" orc's	8	dtw

MATERIALS

DO METER	yes	PROBE AND REEL	yes
CALIBRATION BOTTLE		KCL SOLUTION	
SPARE MEMBRANES		6 SPARE D BATTERIES	
BUCKET		PAPER TOWELS	
INSTRUCTION BINDER		SPARE O-RINGS	
SCISSORS		SPARE DATA SHEETS	
ALCONOX		STICK	
WATER BOTTLE		WATER LEVEL INDICATOR	
(ELECTRIC WENCH TO PULL PUMP OUT WITH)		ORC'S/ ROPE AND ORC INSTALLATION INSTRUCTIONS	

BEFORE MEASUREMENTS

INSPECT MEMBRANE (DAMAGED OR 1/8"BUBBLES)?	no	WARM UP UNIT FOR 20 MINUTES?	yes

PART A: WELL DATA
FIELD MEASUREMENTS

WELL A-9 Temp = 69.3 pH. 6.39 Con=560

INSPECT MEMBRANE (DAMAGED OR 1/8"BUBBLES)?	no	CALIBRATE UNIT?	yes
CALIBRATION TEMPERATURE (C)	18.4	CALIBRATION DO READING (mg/L)	~~9.38~~ 1.06/.96
COMPARED TO CALIBRATION DO TABLE VALUE?	9.47 - 9.28	CALIBRATION BOTTLE READING (mg/L)	9.38
DTW (tob)	9.67	DTB (tob)	39.70

1' From Top = 1.060
middle = .960

DATE: 11-17-95 **TECHNICIAN** J PERFUMO

DISSOLVED OXYGEN (mg/L) (MW-5 CONTINUED) ~~MW-5~~ ? A-9

	30 seconds	60 seconds		30 seconds	60 seconds		30 seconds	60 seconds
1'from TOP	1.09	1.06	MIDDLE	1.00	.96	1'from BOTTOM	.05	.01

PROBE & CORD RINSED? yes

~~MW-5~~	TEMP (°F)	CONDUCTIVITY (umhos)	pH (units)	AVERAGED DISSOLVED OXYGEN (ppm)
A-9	69.3	500	6.39	

PART B: SAMPLING
DO NOT PURGE WELLS FOR MONTHLY SAMPLING EVENT/ DO NOT PERFORM SAMPLING ON MONTH QUARTERLY GW MONITORING EVENT HAPPENS

SAMPLE	ANALYSIS	COMPLETED
A-9	NITRATES, NITRITES	✓

1.08 .98 .03

ARCO Products Company Division of AtlanticRichfieldCompany — 330-109.2B Task Order No. 07600 17037-00 — **Chain of Custody**

ARCO Facility no. 4931	City (Facility) Oakland	Project manager (Consultant) Shaw Garakani	Laboratory name Sequoia
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 441-7500	Fax no. (Consultant) 441-7539
Consultant name Pacific Environmental Group	Address (Consultant) 2025 Gateway Pl. #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 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 ☐	Nitrates	Nitrates
A-9				X		yes	NP	11-17-95	11:40												X	
A-9				↓		↓	↓															X

Method of shipment

Special detection Limit/reporting

Special QA/QC

Remarks

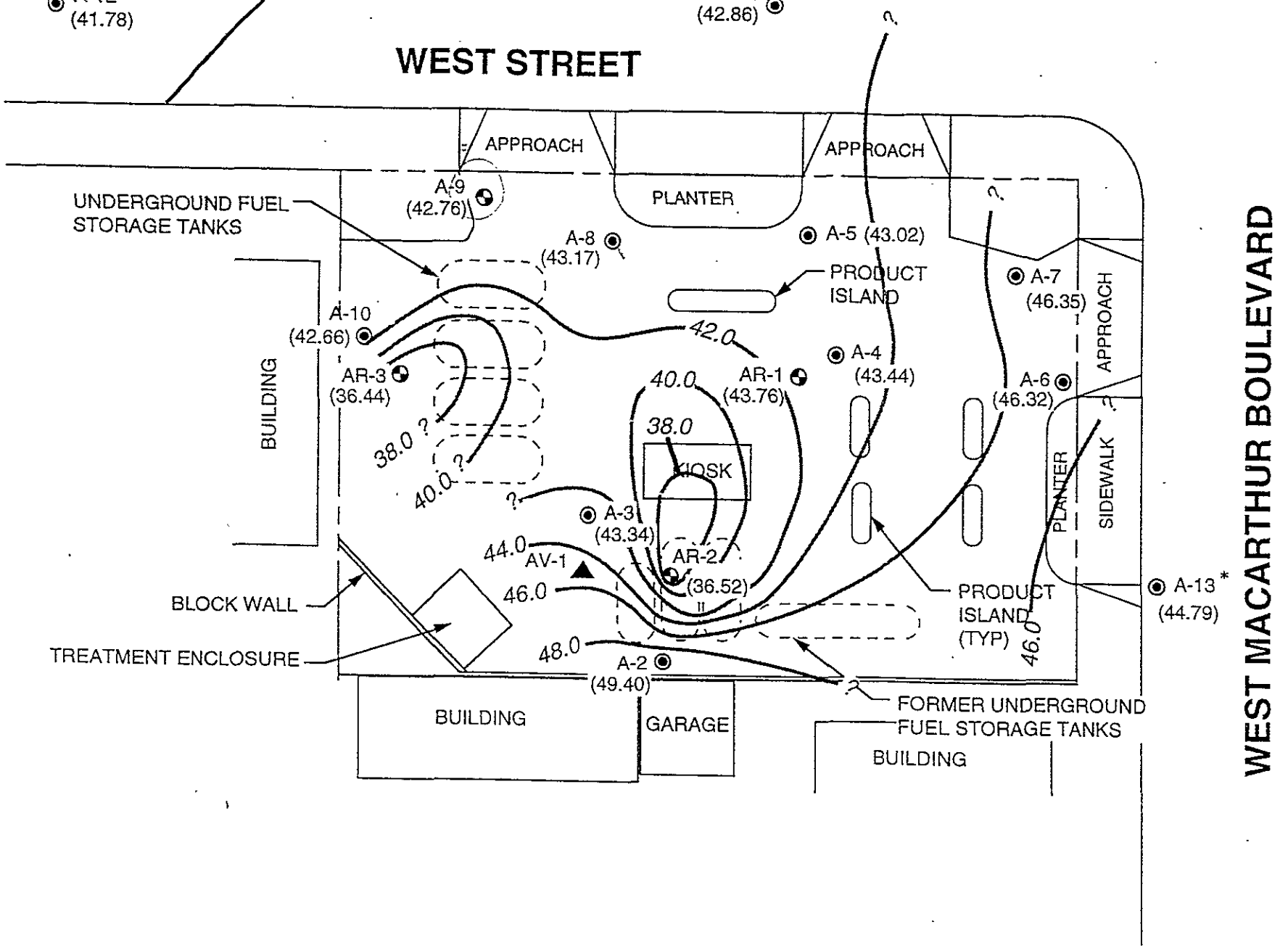
Lab number

Turnaround time

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

Condition of sample:		Temperature received:	
Relinquished by sampler	Date 11-17-95 Time 1:41	Received by	
Relinquished by	Date Time	Received by	
Relinquished by	Date Time	Received by laboratory	Date Time

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



.P FROM.GEO STRATEGIES INC. DATED 6-94

PACIFIC

ARCO SERVICE STATION

ATTACHMENT C

ORC PRODUCT LITERATURE

OXYGEN RELEASE COMPOUND (ORC®)

BIOREMEDIATION – A NATURAL PROCESS

Bioremediation is a process by which microorganisms degrade certain hazardous substances. **REGENESIS'** products enhance the supply of oxygen to naturally occurring microbes which metabolically transform toxic organic compounds into harmless by-products. This carefully designed process can help to cleanup sites and inhibit the flow of polluted groundwater by creating permeable oxygen barriers.

A bioremediation system offers several advantages over other technologies. Other remediation methods may simply transfer the contaminants to another medium which requires removal, transportation, and possibly additional clean up. Bioremediation degrades contaminants on-site and has been shown to be more cost effective than other treatment technologies. The EPA actively promotes bioremediation as an ecologically sound, natural process.

Oxygen is often the limiting factor in aerobic bioremediation. Moisture and nutrients (such as phosphorus and nitrogen) are generally present in sufficient quantities, however, oxygen is rapidly consumed by microbes which thrive in an oxygen rich environment. Without adequate oxygen, contaminant degradation will either cease or may proceed by highly inefficient anaerobic processes. Thus, additional oxygen is needed to stimulate further aerobic microbial growth and activity.

OXYGEN RELEASE COMPOUND, ORC®

Oxygen Release Compound (ORC®) and methods of its application are innovative technologies which enhance bioremediation. ORC is a patented formulation of a very fine, insoluble peroxygen that releases oxygen at a slow, controlled rate when hydrated. Its use has been demonstrated to increase the remediation of hydrocarbon contamination in soil and groundwater.

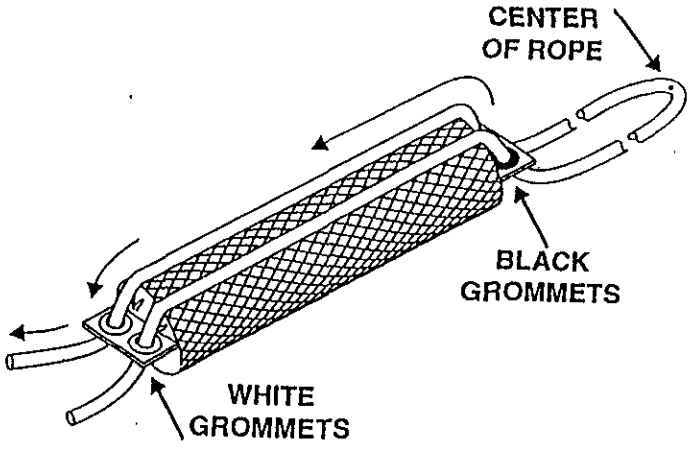
FEATURES

- Magnesium peroxide compound is activated by moisture
- Patented technology controls and prolongs the release of oxygen
- Moderate pH levels are maintained
- Fine particle size has stable, long shelf life
- No external coating of product is required to control rate of oxygen release
- Generates higher dissolved oxygen levels than possible with air

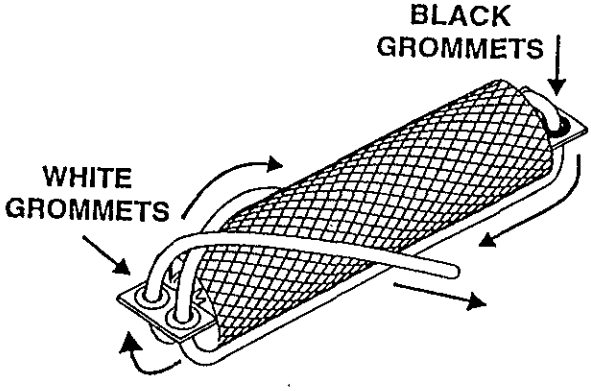
BENEFITS

- Provides a passive, cost-effective, long-term oxygen source
- Does not generate harmful residue; environmentally safe
- Ideal for *in-situ* remediation where other methods are impractical
- Will not disturb the flow pattern of the contaminated plume
- Does not volatilize pollutants
- Can be used as a redox control agent

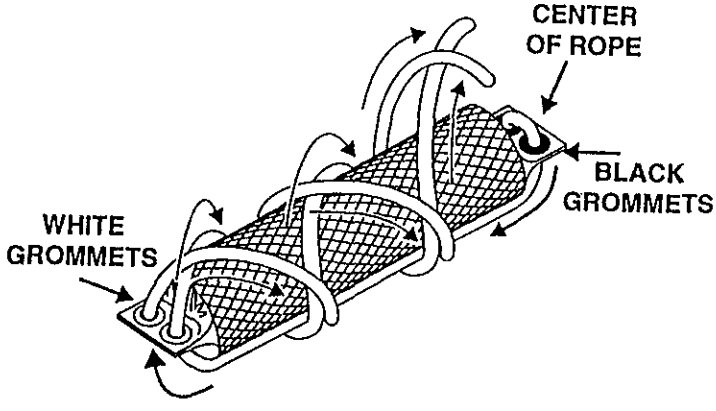
4 INCH AND 6 INCH LACING DIAGRAM



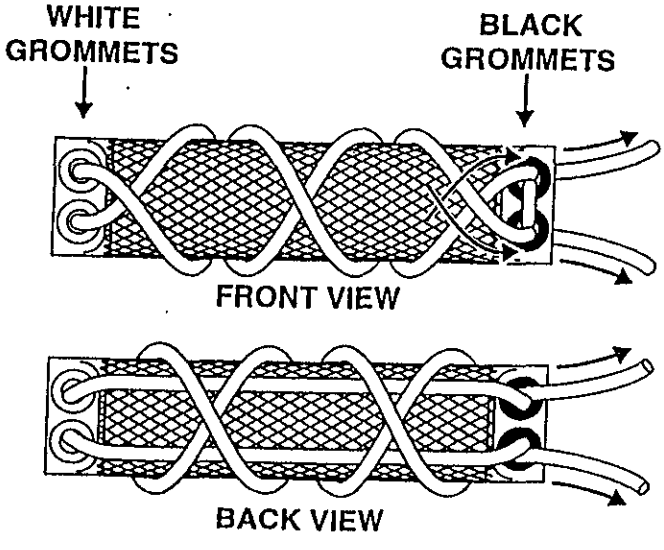
1) Find the center of the rope. Begin lacing the ORC Socks by threading the two ends of the installation rope through the black grommets and then through the white grommets at the bottom of the same side o the bottom sock.



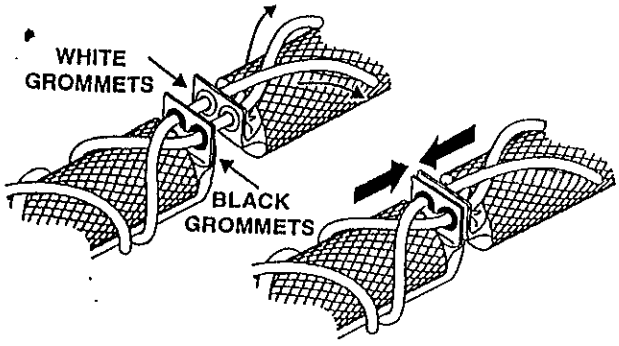
2) Pull the rope through the bottom sock, making sure the center of the rope is between the black grommets. Cross the ropes over each other.



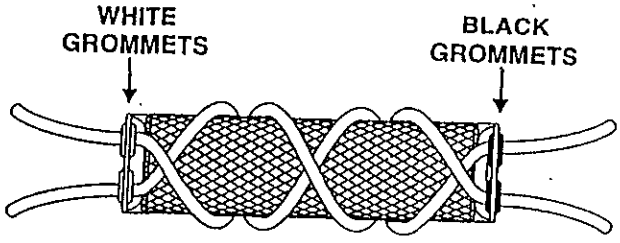
3) Loop the ends of the rope around the back of the sock and cross them. Repeat this step once again, so the rope is wrapped around the sock with two full turns.



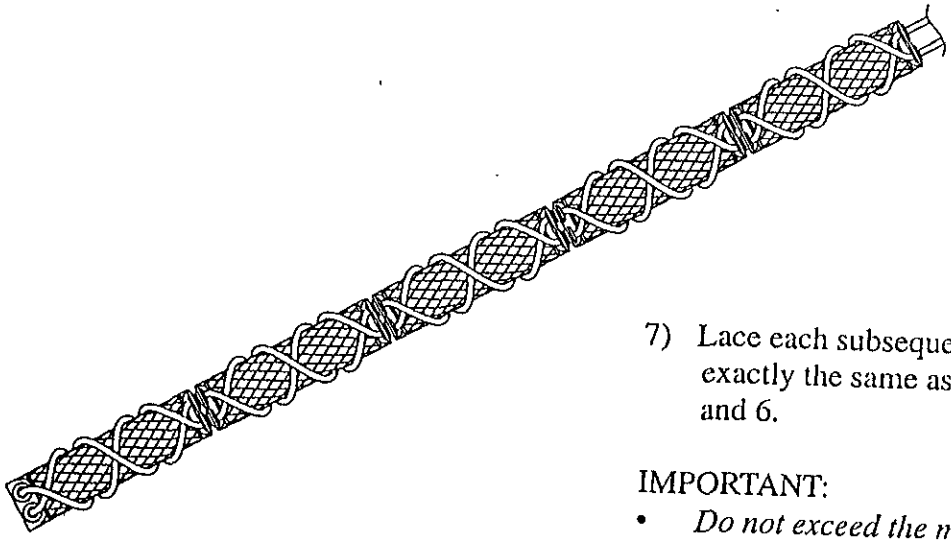
4) Bring the ends of the rope around from the back, cross them, and thread them into the black grommets. The rope ends should be inserted into the black grommets diagonally from the white ones they started from. Threading the black grommets will be tight only on the bottom sock due to the unique lacing pattern.



5) To avoid the ORC Socks slipping past each other, the socks must be laced with the grommet flaps of the bottom sock and second sock butting against each other (as shown).



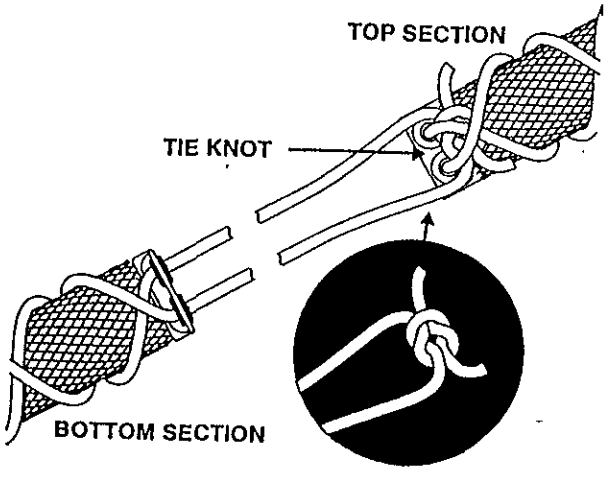
6) The remaining socks on the rope section are laced up according to Figure 6. Make sure that the rope is turned around the sock two full turns, with the grommets of each sock butting up against the next sock as shown in Figure 5.



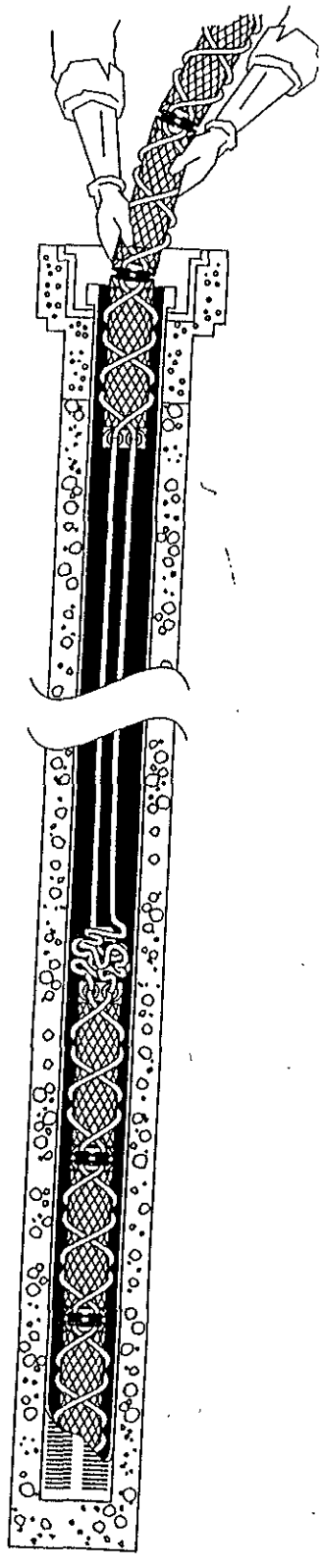
7) Lace each subsequent ORC Sock exactly the same as in Figure 5 and 6.

IMPORTANT:

- *Do not exceed the maximum number of socks per section (see "Key Requirements D & E" on page 1).*
- *Minimize the slack between the socks.*



8) If you need to install more ORC Socks than the maximum allowed per well size (see "Key Requirements D & E" on page 1), then multiple sections must be installed. Each section is laced exactly the same, but they should be tied off to each other. Tie the end of the rope from the lower section to the bottom sock of the upper section; this allows each section to be installed and removed independently. (see well diagram)



Well Diagram