PACIFIC
ENVIRONMENTAL
GROUP, INC.

April 25, 1995
Project 330-109.2A

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

Re: Quarterly Report - Fourth Quarter 1994
Remedial System Performance Evaluation
ARCO Service Station 4931
731 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, presents the results of the fourth quarter 1994 groundwater monitoring and performance evaluation of the groundwater extraction (GWE) and soil vapor extraction (SVE) systems at the site referenced above. In addition, a summary of work completed and anticipated at the site is included.

QUARTERLY GROUNDWATER MONITORING RESULTS

Groundwater samples were collected by Integrated Wastestream Management, Inc. (IWM) on November 17, 1994, and analyzed for the presence of total petroleum hydrocarbons calculated as gasoline (TPH-g), benzene, toluene, ethylbenzene, and xylenes (BTEX compounds). The certified analytical report, chain-of-custody documentation, and field data sheets are presented as Attachment A. IWM's groundwater sampling procedures are presented as Attachment B. The treatment system certified analytical report, chain-of-custody documentation, and field data sheets are presented as Attachment C.

Depth to water data collected on November 17, 1994 indicated that groundwater elevations in site monitoring wells have risen approximately 2.46 feet since August 9, 1994. Groundwater flow is toward the southwest. Groundwater elevation data are presented in Table 1. A groundwater elevation contour map based on the November 17, 1994 data is shown on Figure 1.

The results of groundwater sampling this quarter indicate that TPH-g and benzene concentrations are generally consistent with previous quarterly data. Wells A-2, A-3, A-5, A-7, A-9 through A-13, AR-2, and AR-3 were non-detect for TPH-g. Wells A-2, A-3, A-5, A-6, A-7, A-10 through A-13, AR-2, and AR-3 were non-detect for benzene. Well A-4 contained 3,900 parts per billion (ppb) TPH-g and 420 ppb benzene. Well A-6 contained 53 ppb TPH-g. Well A-9 contained 2.5 ppb benzene. Separate-phase hydrocarbons were observed in Wells A-8 and AR-1 at a thickness 0.32 foot and a sheen, respectively; these wells were not sampled during the November 17, 1994 event. Groundwater analytical data are presented in Table 2. A TPH-g and benzene concentration map is shown on Figure 2.

REMEDIAL PERFORMANCE EVALUATION

Remedial action consisting of GWE and an SPH removal program is currently in progress at this site. The GWE system has been in operation since 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 rate, evaluates and analyzes samples of system influent and effluent for TPH-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 16, 1994.

GROUNDWATER EXTRACTION SYSTEM

Description

The treatment system utilizes electric GWE pumps in Wells A-9, AR-1, AR-2, and AR-3, 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, between the carbon vessels, and at the effluent. The water is discharged to the East Bay Municipal Utility District (EBMUD) sanitary sewer system under Permit No. 502-62131, which was reissued on November 2, 1994, and is in effect until November 1, 1997.

Migration Control

Progress toward meeting the migration control objective is to evaluated by comparison of the liquid surface elevation contour map (Figure 1) and TPH-g and benzene concentration map (Figure 2) from previous and current groundwater monitoring events. The liquid surface contour map from this quarter indicates a groundwater depression extending approximately 25 feet radially around GWE Wells AR-1 and AR-2. The TPH-g and benzene concentration map from this quarter indicates that TPH-g and benzene concentrations in historical downgradient Wells A-3 and A-10 were non-detectable.

Therefore, the migration control objective appears to have been met during fourth quarter 1994.

Mass Reduction

Progress toward meeting the mass reduction objective is determined by evaluating the GWE system mass removal data and the TPH-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 TPH-g mass removal values. During the reporting period the GWE system removed 0.015 pound (0.002 gallon) of TPH-g and less than 0.01 pound (negligible volume) of benzene from the impacted groundwater beneath the site. To date, GWE has removed approximately 1.7 pounds (0.28 gallon) of TPH-g and 0.39 pound (0.05 gallon) of benzene from impacted groundwater beneath the site. Mass removal data for the GWE system are presented in Table 3. The treatment system certified analytical report, chain-of-custody documentation, and field data sheets are presented as Attachment C. Progress toward site remediation is presented in the table below.

	Mass Removed			
	09/30/94 to 12/16/94		Cumulative	
Analyte	(lbs)	(gal)	(lbs)	(gal)
Groundwater Extraction				
TPH-g	0.015	0.002	1.7	0.28
Benzene	0.0	0.0	0.385	0.05
SPH	NA	NA	NA	2.75

lbs = Pounds
gal = Gallons
TPH-g = Total petroleum hydrocarbons calculated as gasoline
SPH = Separate-phase hydrocarbons
NA = Not available
Note: Cumulative mass removed was obtained from available data provided by the previous consultant.

GWE System Operational Data

The GWE system was 100 percent operational during the reporting period.

During the reporting period, the GWE system discharged treated groundwater at an average operational flow rate of approximately 1.7 gallons per minute (gpm), for a period discharge of 109,485 gallons. The instantaneous groundwater system flow rate between 0.34 and 3.4 gpm. Calculations based on 8 percent loading isotherm by weight indicate the primary carbon vessel is approximately 2.12 percent loaded.

During this quarter, the GWE system was in compliance with all conditions stipulated in the discharge permit. Operation and maintenance field data sheets are presented as Attachment C.

CONCLUSIONS

PACIFIC will continue operation, maintenance, and optimization of the GWE system during the first quarter 1995.

SUMMARY OF WORK

Work Completed Fourth Quarter 1994

- Prepared and submitted third quarter 1994 groundwater monitoring and remedial system evaluation report.
- Sampled site wells for fourth quarter 1994 groundwater monitoring program. Sampling performed by IWM.
- Updated EBMUD sanitary sewers discharge permit.
- Continued operation, maintenance, and optimization of the GWE system.

Work Anticipated First Quarter 1995

- Monitor and optimize GWE system performance.
- Prepare and submit fourth quarter 1994 groundwater monitoring and remedial system performance evaluation report.
- Sample site wells for first quarter 1995 groundwater monitoring program. Sampling to be performed by PACIFIC.
- Prepare first quarter 1995 groundwater monitoring and remedial system performance evaluation report.
- Issue quarterly self-monitoring report to the EBMUD.
- Continue operation, maintenance, and optimization of the GWE system.

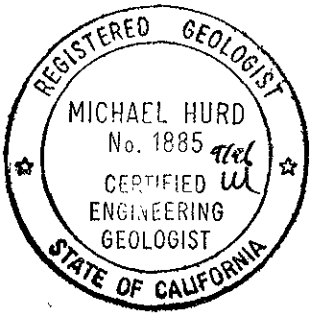
If there are any questions regarding the contents of this letter, please call.

Sincerely,

Pacific Environmental Group, Inc.

Shaw E. Garakani
Project Engineer

Michael Hurd
Senior Geologist
CEG 1885



Attachments:
- Table 1 - Liquid Surface Elevation Data
- Table 2 - Groundwater Analytical Data - Total Petroleum Hydrocarbons (TPH as Gasoline and BTEX Compounds)
- Table 3 - Groundwater Extraction System Performance Data
- Figure 1 - Liquid Surface Elevation Contour Map
- Figure 2 - TPH-g/Benzene Concentration Map
- Attachment A - Certified Analytical Report, Chain-of-Custody Documentation, and Field Data Sheets
- Attachment B - Groundwater Sampling Procedures
- Attachment C - Treatment System Certified Analytical Report, Chain-of-Custody Documentation, and Field Data Sheets

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

Table 1
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
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
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

Table 1 (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-4	01/15/90		9.73	9.74	0.01	44.89
(cont.)	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	42.92
	10/28/92		11.90	11.93	0.03	42.72
	01/26/93		10.55	10.59	0.04	44.07
	04/01/93		10.15	10.17	0.02	44.47
	08/06/93		15.09	15.12	0.03	39.53
	10/14/93		15.37	15.37	0.00	39.25
	11/16/93		14.86	14.86	0.00	39.76
	12/16/93		13.41	13.41	0.00	41.21
	02/10/94		9.30	9.30	0.00	45.32
	05/06/94		10.02	10.02	0.00	44.60
	08/09/94		12.28	12.28	0.00	42.34
	11/17/94		9.44	9.44	0.00	45.18
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
	05/06/94		10.48	10.48	0.00	43.69
	08/09/94		11.86	11.86	0.00	42.31
	11/17/94		9.49	9.49	0.00	44.68
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

Table 1 (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-6	07/10/91		10.03	10.03	0.00	45.10
(cont.)	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
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
	02/10/94		7.40	7.40	0.00	47.31
	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
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

Table 1 (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-8	10/28/92	---------- Well Dry ----------				
(cont.)	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
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 ----------				
	08/06/93	---------- Well Inaccessible ----------				
	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		8.51	8.51	0.00	44.53
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

Table 1 (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-10	11/16/93		14.70	14.70	0.00	39.56
(cont.)	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
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
	01/26/93		9.90	9.90	0.00	43.84
	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
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

Table 1 (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	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
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
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
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

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

Table 2
Groundwater Analytical Data
Total Petroleum Hydrocarbons
(TPH as Gasoline and BTEX Compounds)

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

Well Number	Date Sampled	TPH 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	9.0
	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
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
	11/17/94	<50	<0.5	<0.5	<0.5	<0.5

Table 2 (continued)
Groundwater Analytical Data
Total Petroleum Hydrocarbons
(TPH as Gasoline and BTEX Compounds)

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

Well Number	Date Sampled	TPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
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
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
	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 2 (continued)
Groundwater Analytical Data
Total Petroleum Hydrocarbons
(TPH as Gasoline and BTEX Compounds)

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

Well Number	Date Sampled	TPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
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
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
	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 2 (continued)
Groundwater Analytical Data
Total Petroleum Hydrocarbons
(TPH as Gasoline and BTEX Compounds)

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

Well Number	Date Sampled	TPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
A-8	03/21/86	Well Inaccessible				
	01/07/88	Well Inaccessible				
	03/20/89	0.66 foot of Separate-Phase Hydrocarbons				
	05/24/89	1.20 feet of Separate-Phase Hydrocarbons				
	08/18/89	0.77 foot of Separate-Phase Hydrocarbons				
	10/27/89	1.31 feet of Separate-Phase Hydrocarbons				
	01/15/90	0.87 foot of Separate-Phase Hydrocarbons				
	04/04/90	0.25 foot of Separate-Phase Hydrocarbons				
	07/30/90	1.75 feet of Separate-Phase Hydrocarbons				
	10/29/90	0.10 foot of Separate-Phase Hydrocarbons				
	01/16/91	0.01 foot of Separate-Phase Hydrocarbons				
	04/12/91	0.01 foot of Separate-Phase Hydrocarbons				
	07/10/91	0.01 foot of Separate-Phase Hydrocarbons				
	10/21/91	0.11 foot of Separate-Phase Hydrocarbons				
	02/01/92	1.40 feet of Separate-Phase Hydrocarbons				
	04/29/92	1.30 feet of Separate-Phase Hydrocarbons				
	07/29/92	0.06 foot of Separate-Phase Hydrocarbons				
	10/28/92	Well Dry				
	01/26/93	Well Dry				
	04/01/93	Well Inaccessible				
	08/06/93	Well Dry				
	10/14/93	Well Inaccessible				
	12/10/93	29,000,000	16,000	12,000	19,000	99,000
	02/10/94	NS	NS	NS	NS	NS
	05/06/94	NS	NS	NS	NS	NS
	08/09/94	0.33 foot of Separate-Phase Hydrocarbons				
	11/17/94	0.32 foot of Separate-Phase Hydrocarbons				
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
	07/30/92	<50	14	<0.50	1.7	6.0
	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

Table 2 (continued)
Groundwater Analytical Data
Total Petroleum Hydrocarbons
(TPH as Gasoline and BTEX Compounds)

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

Well Number	Date Sampled	TPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
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
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
	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
	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

Table 2 (continued)
Groundwater Analytical Data
Total Petroleum Hydrocarbons
(TPH as Gasoline and BTEX Compounds)

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

Well Number	Date Sampled	TPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
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
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
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 ----------				
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 ----------				

Table 2 (continued)
Groundwater Analytical Data
Total Petroleum Hydrocarbons
(TPH as Gasoline and BTEX Compounds)

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

Well Number	Date Sampled	TPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
AR-2 (cont.)	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
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 *	<0.5	<0.5	<0.5

ppb = Parts per billion
NA = Not analyzed
NS = Not sampled
* = Laboratory raised MRL due to matrix interference

Table 3

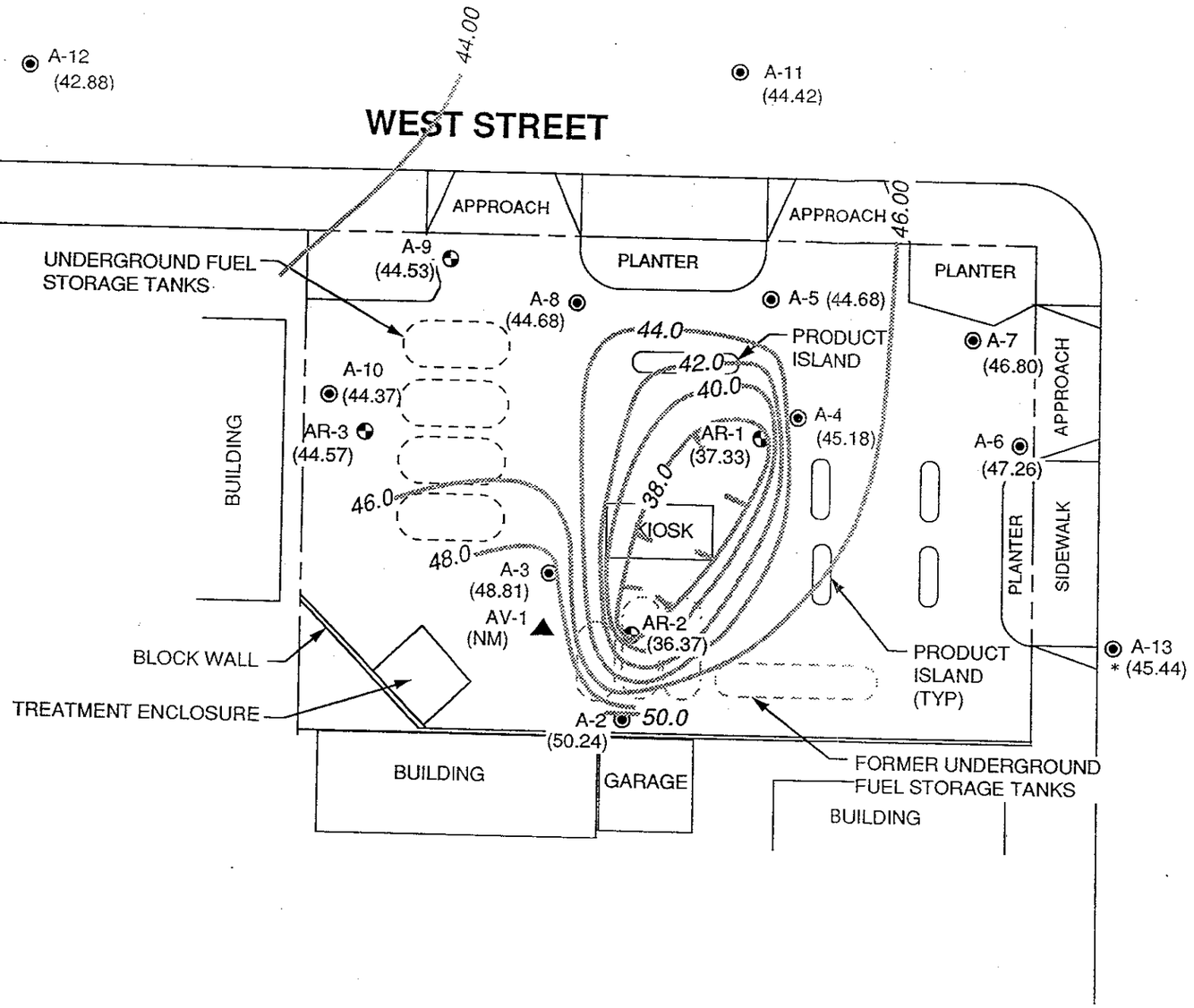
Groundwater Extraction System Performance Data

ARCO Service Station 4931
731 West MacArthur Boulevard
Oakland, California

Sample I.D.	Date Sampled	Totalizer Reading (gallons)	Net Volume (gallons)	Average Flow Rate (gpm)	TPH as Gasoline: Influent Concentration (µg/L)	TPH as Gasoline: Net Removed (lbs)	TPH 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	0.94	740	0.000	1.612	38	0.000	0.381	2.02
INFL	07/15/94	4,143,150	23,100	0.94	ND	0.071	1.684	ND	0.004	0.385	2.10
INFL	08/18/94	4,175,310	32,160	0.66	NS	0.000	1.684	NS	0.000	0.385	2.10
INFL	09/30/94	4,243,295 b	67,985	1.10	NS	0.000	1.684	NS	0.000	0.385	2.10
INFL	10/31/94 c	4,311,280	67,985	1.52	ND	0.000	1.684	ND	0.000	0.385	2.10
INFL	11/09/94	4,330,500	19,220	1.48	56	0.004	1.688	ND	0.000	0.385	2.11
INFL	12/16/94	4,352,780	22,280	0.34	56*	0.010	1.698	ND	0.000	0.385	2.12
REPORTING PERIOD: 9/30/94 - 12/16/95											
TOTAL POUNDS REMOVED:							1.698			0.385	
TOTAL GALLONS REMOVED:							0.278			0.052	
PERIOD POUNDS REMOVED:						0.015			0.000		
PERIOD GALLONS REMOVED:						0.002			0.000		
TOTAL GALLONS EXTRACTED:					4,352,780						
PERIOD GALLONS EXTRACTED:					109,485						
PERIOD AVERAGE FLOW RATE (gpm):					1.1						
PRIMARY BED CAPACITY REMAINING (%):					97.88						

TPH = Total 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 concentrations estimated from prior event 7/15/94.
c. Pacific Environmental Group, Inc. became consultant for the site as of October 1, 1994.
* Data assumed to be equivalent to the concentration of the quarterly sample for the mass removal calculation.
Carbon loading assumes an 8% isotherm.
Pounds of hydrocarbons removed to date provided by prior consultant.
See certified analytical reports for detection limits.



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
- (44.68) LIQUID SURFACE ELEVATION IN FEET - MSL, 11-17-94
- 44.00 LIQUID SURFACE ELEVATION CONTOUR IN FEET - MSL, 11-17-94
- (NM) WELL NOT MEASURED
- * NOT USED IN CONTOURING

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

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

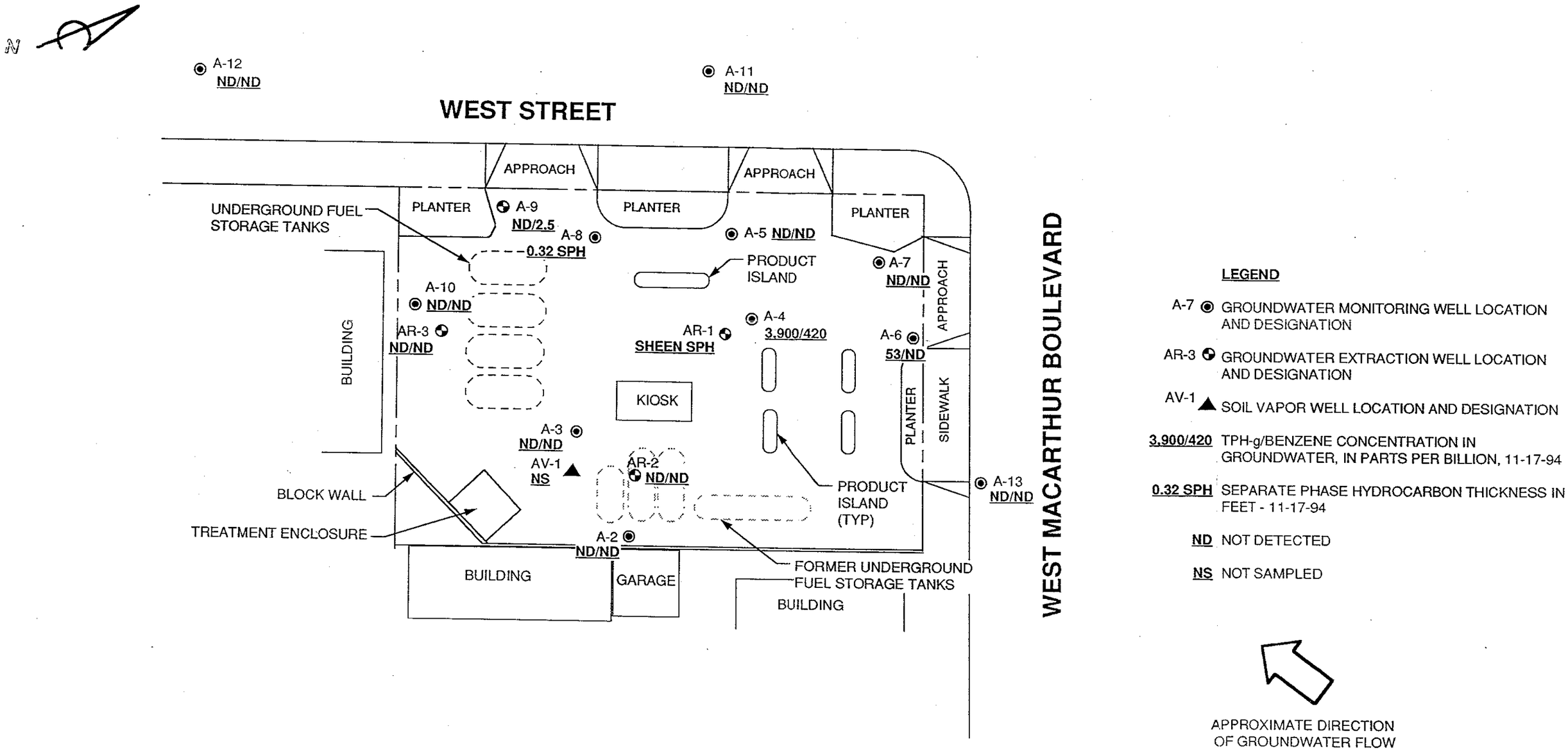
PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE
0 30 60 FEET

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

LIQUID SURFACE ELEVATION CONTOUR MAP

FIGURE: 1
PROJECT: 330-109.2A



LEGEND

- A-7 ◉ GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- AR-3 ◓ GROUNDWATER EXTRACTION WELL LOCATION AND DESIGNATION
- AV-1 ▲ SOIL VAPOR WELL LOCATION AND DESIGNATION
- **3,900/420** TPH-g/BENZENE CONCENTRATION IN GROUNDWATER, IN PARTS PER BILLION, 11-17-94
- **0.32 SPH** SEPARATE PHASE HYDROCARBON THICKNESS IN FEET - 11-17-94
- **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

TPH-g/BENZENE CONCENTRATION MAP

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

ATTACHMENT A

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

330-109.2A

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

December 16, 1994

Kelly Brown
Pacific Environmental Group
2025 Gateway Place, Ste# 440
San Jose, CA 95110

Dear Mr. Brown:

Attached are the field data sheets and analytical results for quarterly ground water sampling at ARCO Facility No. 4931 in Oakland, California. Integrated Wastestream Management measured the depth to water and collected samples from wells at this site on November 17, 1994.

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

Please call us if you have any questions.

Sincerely,
Integrated Wastestream Management

Tom DeLon
Project Manager

Walter H. Howe
Registered Geologist

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

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

INTEGRATED
WASTESTREAM
MANAGEMENT

A4931Q4.XLS

Summary of Ground Water Sample Analyses for ARCO Facility A-4931, Oakland, California

WELL NUMBER	A-2	A-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	A-11	A-12	A-13	AR-1	AR-2	AR-3
DATE SAMPLED	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94	11/17/94
DEPTH TO WATER	5.24	5.85	9.44	9.49	7.91	7.91	9.41	8.51	9.89	9.32	9.17	9.67	17.39	18.10	9.62
SHEEN	NONE	NONE	NONE	NONE	NONE	NONE	FP	NONE	NONE	NONE	NONE	NONE	HEAVY	NONE	NONE
PRODUCT THICKNESS	NA	NA	NA	NA	NA	NA	0.32	NA	NA	NA	NA	NA	NA	NA	NA
TPHg	ND	ND	3,900	ND	53	ND	NA	ND	ND	ND	ND	ND	NA	ND	ND
BTEX															
BENZENE	ND	ND	420	ND	ND	ND	NA	2.5	ND	ND	ND	ND	NA	ND	<1.3#
TOLUENE	ND	ND	11	ND	ND	ND	NA	ND	ND	ND	ND	ND	NA	ND	ND
ETHLYBENZENE	ND	ND	38	ND	ND	ND	NA	0.9	ND	ND	ND	ND	NA	ND	ND
XYLENES	ND	ND	92	ND	ND	ND	NA	3.3	ND	ND	ND	ND	NA	ND	ND

FOOTNOTES:

Concentrations reported in ug/L (ppb)

TPHg = Total Purgeable Petroleum Hydrocarbons (USEPA Method 8015 Modified)

BTEX Distinction (USEPA Method 8020)

PCE = Tetrachloroethene (USEPA Method 8010)

* = Well inaccessible

** = Not sampled per consultant request

DCE = cis-1, 2-Dichloroethene (USEPA Method 8010)

TCE = Trichloroethene (USEAP Method 8010)

ND = Not Detected

NA = Not applicable

FP = Floating product

= See laboratory analytical report

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

FIELD REPORT

Depth To Water / Floating Product Survey

Site Arrival Time: 850

Site Departure Time: 1450

Weather Conditions: Partly Cloudy, Cool

DTW: Well Box or Well Casing (circle one)

Project No.: _____ **Location:** 731 W. MacArthur Blvd. OAK **Date:** November 17, 1994

Client / Station#: Arco 4931 **Field Technician:** Vince / Cisco **Day of Week:** Thursday

DTW ORDER	WELL ID	SURFACE SEAL	LID SECURE	GASKET	LOCK	EXPANDING CAP	TOTAL DEPTH (Feet)	FIRST DEPTH TO WATER (Feet)	SECOND DEPTH TO WATER (Feet)	DEPTH TO FLOATING PRODUCT (Feet)	FLOATING PRODUCT THICKNESS (Feet)	SHEEN (Y=YES, N=NO) FP=FLOATING PRODUCT	COMMENTS	MATERIALS
12	A-2	OK	Yes	None	OK	None	19.80	5.24	5.24	N/A	N/A	N	4"	Christy
6	A-3	OK	Yes	None	OK	OK	17.15	5.85	5.85	N/A	N/A	N	4"	Christy
13	A-4	OK	Yes	None	OK	None	20.42	9.44	9.44	N/A	N/A	N	4"	Christy
11	A-5	OK	Yes	None	OK	OK	24.01	9.49	9.49	N/A	N/A	N	3"	Christy
9	A-6	OK	Yes	None	OK	None	25.60	7.91	7.91	N/A	N/A	N	3"	Christy
10	A-7	OK	Yes	None	OK	None	22.86	7.91+	7.91+	N/A	N/A	N	3", H2O IN BOX	Christy
15	A-8	OK	Yes	None	OK	OK	N/A	9.41	9.41	9.09	0.32	YES	3"	crowbar screw D
3	A-9	OK	Yes	OK	None	None	36.0	8.51	8.51	N/A	N/A	N	6" YES Plumbing INTACT	crowbar screw-D
4	A-10	OK	Yes	None	OK	None	30.16	9.89	9.89	N/A	N/A	N	3"	Christy
1	A-11	OK	Yes	None	OK	None	28.12	9.32	9.32	N/A	N/A	N	3" ~~DO~~ H2O IN BOX	Christy
2	A-12	OK	Yes	None	OK	None	29.92	9.17	9.17	N/A	N/A	N	3" H2O IN BOX	Christy
8	A-13	OK	Yes	None	OK	OK	29.40	9.67	9.67	N/A	N/A	N	3" H2O in BOX	Christy
14	AR-1	OK	Yes	None	None	None	N/A	17.39	17.39	≈	≈	YES	6" Heavy sheen observed prior to Purging NO SHEEN	crowbar screw D
7	AR-2	OK	Yes	OK	None	None	27.50	18.10	18.10	N/A	N/A	N	6" YES Plumbing intact	crowbar screw D
5	AR-3	OK	Yes	None OK	None	None	27.20	9.62	9.62	N/A	N/A	N	4" YES Plumbing intact	crowbar screw D

PAGE 2 OF 5 DATE: 11-17-94 CLIENT/STATION #: ARCO 4931 ADDRESS: 731 W. MacArthur Blvd. Oak.

WELL ID: A-13 TD 29.40 DTW 9.67 × 0.38 Gal./Linear Ft. × 3 Casing Volume = 22.49 Calculated Purge

DATE PURGED: 11-17-94 START (2400 HR): 1155 END (2400 HR) 1208
DATE SAMPLED: 11-17-94 TIME (2400 HR): 1203 DTW: 18.2

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1157	5	7.03	0.44	66.3	CLEAR
1158	10	6.96	0.44	70.4	CLEAR
1159	15	6.94	0.45	69.8	CLEAR
1200	22.5	6.92	0.43	69.4	CLEAR

Total purge: 22.5
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-6 TD 25.60 DTW 7.91 × 0.38 Gal./Linear Ft. × 3 Casing Volume = 20.16 Calculated Purge

DATE PURGED: 11-17-94 START (2400 HR): 1212 END (2400 HR) 1219
DATE SAMPLED: 11-17-94 TIME (2400 HR): 1222 DTW: 10.7

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1214	5	6.91	0.29	69.6	CLOUDY
1216	10	6.89	0.31	69.1	CLEAR
1217	15	6.92	0.37	68.6	CLEAR
1219	20	6.91	0.38	68.4	CLOUDY

Total purge: 20
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-7 TD 22.86 DTW 7.91+ × 0.38 Gal./Linear Ft. × 3 Casing Volume = 17.04 Calculated Purge

DATE PURGED: 11-17-94 START (2400 HR): 1234 END (2400 HR) 1238
DATE SAMPLED: 11-17-94 TIME (2400 HR): 1242 DTW: 11.7

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1235	5	6.89	0.20	67.8	CLOUDY
1236	10	6.87	0.26	67.2	CLEAR
1238	17	6.90	0.33	67.1	CLEAR

Total purge: 17
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-5 TD 24.01 DTW 9.49 × 0.38 Gal./Linear Ft. × 3 Casing Volume = 16.55 Calculated Purge

DATE PURGED: 11-17-94 START (2400 HR): 1249 END (2400 HR) 1259
DATE SAMPLED: 11-17-94 TIME (2400 HR): 1258 DTW: 14.1

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1250	5	6.83	0.60	69.2	CLEAR
1252	10	6.83	054	68.7	CLOUDY
1254	17	6.82	055	68.2	CLOUDY

Total purge: 17
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

PRINT NAME: Francisco Noriega SIGNATURE: Francisco Noriega

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

PAGE 3 OF 5 DATE: 11-17-94 CLIENT/STATION #: Arco 4931 ADDRESS: 731 W. MacArthur Blvd, Oak.

WELL ID: A-2 | 19.80 TD - 5.24 DTW x 0.66 Gal./Linear Ft. x 3 Casing Volume = 28.82 Calculated Purge

DATE PURGED: 11-17-94 START (2400 HR): 1305 END (2400 HR) 1308
DATE SAMPLED: 11-17-94 TIME (2400 HR): 1313 DTW: 16.8

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1306	5	6.83	0.29	64.8	CLEAR
1308	9	6.82	0.33	64.1	CLEAR

Total purge: 9
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: WELL PUMPED DRY AT 9 GALLONS

WELL ID: A-4 | 20.92 TD - 9.94 DTW x 0.66 Gal./Linear Ft. x 3 Casing Volume = 21.74 Calculated Purge

DATE PURGED: 11-17-94 START (2400 HR): 1320 END (2400 HR) 1324
DATE SAMPLED: 11-17-94 TIME (2400 HR): 1327 DTW: 18.2

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1322	5	6.86	0.90	69.1	CLEAR
1324	8	6.87	0.92	68.5	CLEAR

Total purge: 8
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: WELL PUMPED DRY AT 8 GALLONS.

WELL ID: A-12 | 29.92 TD - 9.17 DTW x 0.17 Gal./Linear Ft. x 3 Casing Volume = 10.58 Calculated Purge

DATE PURGED: 11-17-94 START (2400 HR): END (2400 HR)
DATE SAMPLED: 11-17-94 TIME (2400 HR): DTW:

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
	2				
	6				

VOID

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

2.43

WELL ID: A-11 | 28.12 TD - 9.32 DTW x 0.38 Gal./Linear Ft. x 5 Casing Volume = Calculated Purge

DATE PURGED: 11-17-94 START (2400 HR): 1120 END (2400 HR) 1126
DATE SAMPLED: 11-17-94 TIME (2400 HR): 1130 DTW: 9.57

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1121	2	6.91	0.48	65.2	CLOUDY
1123	10	6.92	0.49	67.2	CLEAR
1125	16	6.93	0.48	66.9	CLEAR
1126	21.5	6.92	0.47	66.2	CLOUDY

Total purge: 21.5
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

PRINT NAME: Francisco Arangon SIGNATURE: Francisco Arangon

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

PAGE 4 OF 5 DATE: 11-17-94 CLIENT/STATION #: Arco #931 ADDRESS: 731 W. MacArthur Blvd. Oak.

WELL ID: AR-2 TD 27.50 DTW 18.10 x 1.5 Gal./Linear Ft. x 2 Casing/Volume = 28.20 Calculated Purge

DATE PURGED: 11-17-94 START (2400 HR): 1338 END (2400 HR) 1345
DATE SAMPLED: 11-17-94 TIME (2400 HR): 1350 DTW: 25.4

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1341	2	7.21	0.52	68.0	clear
1344	14	7.11	0.49	67.5	clear
1345	15	7.11	0.48	67.3	clear

Total purge: 15
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Well pumped dry at 15 gallons.

WELL ID: A-12 TD 29.97 DTW 9.17 x 0.38 Gal./Linear Ft. x 3 Casing/Volume = 23.65 Calculated Purge

DATE PURGED: 11-17-94 START (2400 HR): 1424 END (2400 HR) 1432
DATE SAMPLED: 11-17-94 TIME (2400 HR): 1436 DTW: 13.3

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1426	3	7.04	0.51	67.1	clear
1428	11	6.95	0.48	66.9	clear
1431	20	6.90	0.56	66.8	clear
1432	24	6.89	0.57	66.5	clear

Total purge: 24
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

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

DATE PURGED: _____ START (2400 HR): _____ END (2400 HR) _____
DATE SAMPLED: _____ TIME (2400 HR): _____ DTW: _____

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)

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

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

DATE PURGED: _____ START (2400 HR): _____ END (2400 HR) _____
DATE SAMPLED: _____ TIME (2400 HR): _____ DTW: _____

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)

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

PRINT NAME: Vince Valdes SIGNATURE: Vince Valdes

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

PAGE 5 OF 5 DATE: 11-17-94 CLIENT/STATION #: Arco 4931 ADDRESS: 731 W. MacArthur Blvd. Oak.

WELL ID: A-9 TD 36.0 . DTW 8.51 x Gal./Linear Ft. @1.5 x Casing Volume 2 - Calculated Purge 82.47

DATE PURGED: 11-17-94 START (2400 HR): 1149 END (2400 HR) 1207
DATE SAMPLED: 11-17-94 TIME (2400 HR): 1212 DTW: 10.2

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1152	2	7.48	0.52	68.8	clear
1157	35	7.37	0.53	67.3	clear
1202	55	7.26	0.52	67.0	clear
1207	82	7.24	0.57	66.8	clear

Total purge: 82

PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: teflon Bailer Disp.

REMARKS:

WELL ID: A-10 TD 30.16 . DTW 9.89 x Gal./Linear Ft. 0.38 x Casing Volume 3 - Calculated Purge 23.10

DATE PURGED: 11-17-94 START (2400 HR): 1226 END (2400 HR) 1233
DATE SAMPLED: 11-17-94 TIME (2400 HR): ~~1228~~ 1236 DTW: 12.3

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1228	3	6.98	0.62	68.1	Black
1232	9	6.90	0.51	67.3	Black
1234	15	6.88	0.49	67.0	clear
1233	24	6.87	0.55	66.9	clear

Total purge: 24

PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.

REMARKS:

WELL ID: AR-3 TD 27.20 . DTW 9.62 x Gal./Linear Ft. 0.66 x Casing Volume 3 - Calculated Purge 34.80

DATE PURGED: 11-17-94 START (2400 HR): 1248 END (2400 HR) 1300
DATE SAMPLED: 11-17-94 TIME (2400 HR): 1304 DTW: 12.7

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1252	5	7.10	0.54	67.9	brown
1255	15	6.97	0.58	67.3	brown
1258	25	6.94	0.55	67.0	clear
1300	34	6.93	0.55	66.9	clear

Total purge: 34

PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.

REMARKS:

WELL ID: A-3 TD 17.15 . DTW 5.85 x Gal./Linear Ft. 0.66 x Casing Volume 3 - Calculated Purge 22.37

DATE PURGED: 11-17-94 START (2400 HR): 1314 END (2400 HR) 1320
DATE SAMPLED: 11-17-94 TIME (2400 HR): 1324 DTW: 15.8

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1316	2	7.11	0.36	67.3	clear
1318	8	7.06	0.28	67.0	clear
1320	9	7.06	0.29	66.8	clear

Total purge: 9

PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.

REMARKS: Well pumped dry at 8 and again at 9 gallons.

PRINT NAME: Vince Valdes SIGNATURE: Vin Valdes

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

Columbia Analytical Services INC.

December 6, 1994

Service Request No. S941482

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

RECEIVED
DEC 07 1994

Re: **ARCO Facility No. 4931**

Dear Ms. Austin/Mr. DeLon:

Attached are the results of the water samples submitted to our lab on November 18, 1994. For your reference, these analyses have been assigned our service request number S941482.

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

Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.

Keoni A. Murphy
Program Director

Annelise J. Bazar
Regional QA Coordinator

KAM/ajb

4224 Pinewood Avenue • San Jose, California 95134 • Telephone 408/435-8100 • Fax 408/435-8264

COLUMBIA ANALYTICAL SERVICES, Inc.

Acronyms

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

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

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client: IWM
Project: ARCO Facility No. 4931
Sample Matrix: Water

Service Request: S941482
Date Collected: 11/17/94
Date Received: 11/18/94
Date Extracted: NA
Date Analyzed: 11/29,30/94

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

Analyte:		TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes, Total
Units:		ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
Method Reporting Limit:		50	0.5	0.5	0.5	0.5
Sample Name	**Lab Code**					
A-2 (16.8)	S941482-001	ND	ND	ND	ND	ND
A-3 (15.8)	S941482-002	ND	ND	ND	ND	ND
A-4 (18.2)	S941482-003	3,900	420	11	38	92
A-5 (14.1)	S941482-004	ND	ND	ND	ND	ND
A-6 (10.7)	S941482-005	53	ND	ND	ND	ND
A-7 (16.7)	S941482-006	ND	ND	ND	ND	ND
A-9 (10.2)	S941482-007	ND	2.5	ND	0.9	3.3
A-10 (12.3)	S941482-008	ND	ND	ND	ND	ND
A-11 (9.7)	S941482-009	ND	ND	ND	ND	ND
A-12 (13.3)	S941482-010	ND	ND	ND	ND	ND
A-13 (18.2)	S941482-011	ND	ND	ND	ND	ND
AR-2 (25.4)	S941482-012	ND	ND	ND	ND	ND
AR-3 (12.7)	S941482-013	ND	<1.3 *	ND	ND	ND
Method Blank	S941129-WB	ND	ND	ND	ND	ND
Method Blank	S941130-WB	ND	ND	ND	ND	ND

* Raised MRL due to matrix interference.

Approved By: _____ Date December 6, 1994

5ABTXGAS/061694

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

APPENDIX A

LABORATORY QC RESULTS

1921 Ringwood Avenue • San Jose, California 95131 • Telephone 408/432-8192

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 4931
Sample Matrix: Water

Service Request: S941482
Date Collected: 11/17/94
Date Received: 11/18/94
Date Extracted: NA
Date Analyzed: 11/29,30/94

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

Sample Name	Lab Code	Percent Recovery α,α,α-Trifluorotoluene
A-2 (16.8)	S941482-001	103
A-3 (15.8)	S941482-002	100
A-4 (18.2)	S941482-003	105 *
A-5 (14.1)	S941482-004	102
A-6 (10.7)	S941482-005	103
A-7 (16.7)	S941482-006	98
A-9 (10.2)	S941482-007	101
A-10 (12.3)	S941482-008	99
A-11 (9.7)	S941482-009	99
A-12 (13.3)	S941482-010	98
A-13 (18.2)	S941482-011	97
AR-2 (25.4)	S941482-012	98
AR-3 (12.7)	S941482-013	98
A-6 (10.7) MS	S941482-005MS	116
A-6 (10.7) DMS	S941482-005DMS	116
Method Blank	S941129-WB	99
Method Blank	S941130-WB	102

CAS Acceptance Limits: 69-116

* The surrogate used for this sample was 4-bromofluorobenzene

Approved By: _____ Date: December 6, 1994

SUR1/062994

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 4931

Service Request: S941482
Date Analyzed: 11/29/94

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

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	24.3	97	85-115
Toluene	25	24.6	98	85-115
Ethylbenzene	25	25.5	102	85-115
Xylenes, Total	75	68.4	91	85-115
Gasoline	500	493	99	90-110

Approved By: _____ Date: _____

ICV25AL/060194

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

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO Facility No. 4931
Sample Matrix: Water

Service Request: S941482
Date Collected: 11/17/94
Date Received: 11/18/94
Date Extracted: NA
Date Analyzed: 11/29/94

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

Sample Name: A-6 (10.7)
Lab Code: S941482-005

Analyte	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference
Gasoline	250	250	53	290	291	95	95	67-121	<1

Approved By: Kevin A Murphy Date: 12/14/94

DMS1S/060194

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

APPENDIX B

CHAIN OF CUSTODY

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

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. IWM-94-5CC

Chain of Custody

ARCO Facility no. A4931	City (Facility) OAKland	Project manager (Consultant) TOM DeSon	Laboratory name Columbia
ARCO engineer M.W.	Telephone no. (ARCO) 415571 2434	Telephone no. (Consultant) 408/9428955	Fax no. (Consultant) 408/9421499
Consultant name IWM	Address (Consultant) 950 Ames av. Milp. CA95035		Contract number 07077

Method of shipment: Sampler deliver

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH 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 ☐			
FB-1	14	2		✓		✓	✓	11-17-94	900		✓	✓											
A-2	1	2		✓		✓	✓		1313		✓	✓											
A-3	2	2		✓		✓	✓		1324		✓	✓											
A-4	3	2		✓		✓	✓		1327		✓	✓											
A-5	4	2		✓		✓	✓		1258		✓	✓											
A-6	5	2		✓		✓	✓		1222		✓	✓											
A-7	6	2		✓		✓	✓		1242		✓	✓											
A-9	7	2		✓		✓	✓		1212		✓	✓											
A-10	8	2		✓		✓	✓		1236		✓	✓											
A-11	9	2		✓		✓	✓		1130		✓	✓											
A-12	10	2		✓		✓	✓		1436		✓	✓											
A-13	11	2		✓		✓	✓		1203		✓	✓											
AR-2	12	2		✓		✓	✓		1350		✓	✓											
AR-3	13	2		✓		✓	✓		1304		✓	✓											

Special detection Limit/reporting

Special QA/QC

Remarks: Hold on FB-1

Lab number: 9941482

Turnaround time

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

Condition of sample: Okay

Temperature received: Cool

Relinquished by sampler	Date 11/18/94	Time 1235P	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory

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

APPC-3292 (2-91)

ATTACHMENT B

GROUNDWATER SAMPLING PROCEDURES

FIELD PROCEDURES: GROUNDWATER SAMPLING

PRELIMINARY: SITE SAFETY

IWM SAFETY PRACTICES APPLY AT ALL TIMES! OBSERVE ALL STANDARD PROCEDURES WITH SPECIAL ATTENTION TO THESE HAZARDS:

- **Vehicular traffic: Insure visibility of yourself and your equipment**
- **Pedestrian activity: Anticipate and prevent tripping hazards**

A. WATER-LEVEL MEASUREMENTS

GENERAL

1. Water-level measurements must be taken before disturbing the water in the well in any way. The water in the well should be in an undisturbed state for a minimum of 24 hours before performing this task.
2. To insure consistency in date from event-to-event, the measurement must be taken from the same point on the well top casing. As a general rule, take the measurement from the highest point of the casing. Typically, there is a notch in the casing for this purpose. If no such mark is visible, place one at the highest point of the casing, take measurements from that point, and make a note of this in the field notes.
3. Always work from the cleanest wells (based on past data) to the dirtiest.
4. Keep your equipment CLEAN! Between wells clean the probes, lines and associated attachments with a clean cloth soaked in water containing Alconox (or like cleaning agent). Thoroughly rinse in tap water in a 5 gallon bucket. After each rinsing, empty the bucket into a 55 gallon drum or other purge water containment vessel.
5. Take measurements to the nearest .01 foot.

PROCEDURE (NO FREE PRODUCT ANTICIPATED)

1. Inspect the wellhead for the following: damage of any kind, indications of possible leakage into the well at the wellhead, damaged or missing locks, etc. Remove any standing water in or around the well head. Note all irregularities.
2. Lower the (CLEAN!) water-level indicator slowly down the well until the indicator sounds.
3. Continue lowering the indicator about 2 inches more before very slowly raising the indicator until the sound stops.
4. Take the measurement at the casing.
5. Repeat this procedure. If the next reading is within .01 foot of the first, then record the first measurement. If not, repeat this procedure until two consecutive measurements are within .01 foot.
6. Remove and CLEAN the equipment (probe and tape) before proceding to the next well.

PROCEDURE (FREE PRODUCT ANTICIPATED)

1. Inspect the wellhead for the following: damage of any kind, indications of possible leakage into the well at the wellhead, damaged or missing locks, etc. Remove any standing water in or around the well head. Note all irregularities.
2. Lower the (CLEAN!) oil-water interface probe slowly down the well until the indicator sounds. The presence of product is indicated by a steady sound; its absence by a broken sound. (If there is no evidence of product, follow procedure for water-level measurements where no product is anticipated.)
3. If the presence of product is indicated, lower the probe very slowly until the signal changes to broken pattern.
4. Continue lowering the indicator about 2 inches more before very slowly raising the indicator until the sound becomes steady; note this measurement at the casing as the depth to water. Continue raising the probe until the sound stops; note this measurement at the casing as the depth to product.
5. Repeat this procedure. If the next readings are within .01 foot of the first set, then record the first measurements. If not, repeat this entire procedure until two consecutive measurements sets are within .01 foot.
6. Remove and CLEAN the equipment before using in another well.

B. SUBJECTIVE ANALYSIS

GENERAL

1. Always work from the cleanest wells (based on past data) to the dirtiest.
2. Follow this procedure for cleaning the bailer between wells:
a. Fill and empty the bailer once using tap water.
b. Refill bailer approximately two-thirds full with a mixture of water and Alconox (or like cleaning agent).
c. Clean bailer inside and out with a bottle brush.
d. Empty the bailer then repeat this process at least three times.
e. After each cleaning, empty the cleaning liquids into a 55 gallon drum or other purge water containment vessel.
3. Clean the lines (or wire) and associated attachments with a clean cloth soaked in water containing Alconox (or like cleaning agent). Thoroughly rinse in tap water in a 5 gallon bucket. After each rinsing, empty the bucket into a 55 gallon drum or other purge water containment vessel.

PROCEDURE

1. Gently lower the (CLEAN) bailer into the well until it reaches the water surface.
2. Lower the bailer further about half its length.
3. Remove the bailer and examine the water therein for the following:
a. Presence of Free Product: Note and record thickness to the nearest eighth of an inch.
b. Sheen: Note visual indications of sheen as follows: "Heavy", "Moderate" or "Llight".
c. Emulsion: Record presence of emulsion as "Heavy", "Moderate", or "Light".
d. Color: Record if floating product is present.

C. WELL PURGING: GENERAL

GENERAL

1. To minimize any risk of cross contamination, whenever possible use surface pumps and disposable tubing.
2. If another alternative is used for purging (bailers, submersible pumps, bladder pumps, etc.), follow cleaning procedures outlined for bailers and equipment above.

PROCEDURE

1. **Determine the volume of water in the well.**
2. **If the well recharges, remove three well volumes. If the well doesn't recharge, or does so slowly, continue purging until the recharge water stabilizes with regard to pH, temperature and conductivity, or until the well is empty.**
3. **Contain purged water in labeled 55 gallon drums or other provided containment.**

D. WATER SAMPLE COLLECTION

GENERAL

1. **In general, use disposable bailers for all sampling.**
2. **If a teflon bailer is reused, follow this procedure for cleaning the bailer between wells:**

a. Fill and empty the bailer once using tap water.
b. Refill bailer approximately two-thirds full with a mixture of water and Alconox (or like cleaning agent).
c. Clean bailer inside and out with a bottle brush.
d. Empty the bailer then repeat this process at least three times.
e. After each cleaning, empty the cleaning liquids into a 55 gallon drum or other purge water containment vessel.

3. **Clean the lines (or wire) and associated attachments with a clean cloth soaked in water containing Alconox (or like cleaning agent). Thoroughly rinse in tap water in a 5 gallon bucket. After each rinsing, empty the bucket into a 55 gallon drum or other purge water containment vessel.**
4. **Always work from the cleanest wells (based on past data) to the dirtiest.**
5. **Always keep your samples chilled.**

PROCEDURE

1. **If well recharges, sample may be obtained immediately after purging. If during the course of the sampling day a well does not recharge sufficiently to half fill the bailer, return the next morning to take the sample.**
2. **Review the sampling list to determine which analysis(es) is(are) required for each well during this sampling event. Note any special handling requirements (addition of preservatives, etc.). Complete the sample labels with the following: sample ID number, project ID number and date. Attach the labels to the sample**

containers. Always prepare duplicate samples for analysis and indicate the number of containers on the Chain of Custody. Also, label two sample containers with the project ID number, date and the words "Field Blank"; fill these two containers with distilled water and place in the holders provided for transport (see 5. below).

3. Lower a new disposable bailer into the well and take a sample from below the water's surface. Minimize agitation while removing the bailer.

4. Using the valve at the bottom of the bailer, fill the sample vial very slowly to minimize agitation of the liquid. Cap the vial tightly, then tap it and invert it to check for any air. Top off the vial if there is any air present.

5. Place all sample vials in the holders provided for transport. Place holders inside a cooler containing enough ice to keep the sample temperature below 4 degrees Centigrade. However, do not permit the samples to freeze.

6. After sampling is complete, lock cooler if possible; if not, seal with tape and sign across tape so that any tampering will be evident.

7. Enter the information concerning the collected samples on the field notes and on the Chain of Custody.

8. Before resealing each wellhead, replace any lock or cap, as required.

E. CHAIN OF CUSTODY PROCEDURE

GENERAL

1. Only list on the Chain of Custody those samples that will go to the lab; samples to be held for possible future analysis should only be noted on the field notes.

2. Fill out the Chain of Custody in ink.

PROCEDURE

1. Fill out as much of the form as possible before beginning work on the site.

2. Provide the following:

a. Your name, signature and phone number.

b. The Project Manager's name and phone number.

c. The laboratory.

d. The turnaround time.

3. For each sample, provide the sample ID number, site ID, sample date and analysis(es) requested.
4. After the samples are taken, note the sample condition.
5. The completed Chain of Custody must accompany the shipping container to the laboratory; keep a copy for the Project Manager.
6. Each time the samples change custody the date and time are directely noted on the Chain of Custody which is signed by both the transferor and the transferee.
7. The laboratory will make the final entry upon receipt of the samples. Sample condition will be noted on the Chain of Custody. The original Chain of Custody will be returned with the sample results and a copy will be kept by the laboratory.

ATTACHMENT C

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

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
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

Project: 330-109.5A/4931, Oakland

Enclosed are the results from samples received at Sequoia Analytical on November 2, 1994.
The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE COLLECTED	TEST METHOD
9411201 -01	LIQUID, Effl	10/31/94	TPHGBW Purgeable TPH/BTEX
9411201 -02	LIQUID, Infl	10/31/94	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

Eileen Manning
Project Manager

Quality Assurance Department

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Proj. ID: 330-109.5A/4931, Oakland	Sampled: 10/31/94
2025 Gateway Place, Suite 440	Sample Descript: Effl	Received: 11/02/94
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 11/05/94
Attention: Maree Doden	Lab Number: 9411201-01	Reported: 11/14/94

QC Batch Number: GC110494BTEX02A
Instrument ID: GCHP2

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	77

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

SEQUOIA ANALYTICAL - ELAP #1210

Eileen Manning
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Proj. ID: 330-109.5A/4931, Oakland	Sampled: 10/31/94
2025 Gateway Place, Suite 440	Sample Descript: Infl	Received: 11/02/94
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 11/07/94
Attention: Maree Doden	Lab Number: 9411201-02	Reported: 11/14/94

QC Batch Number: GC110794BTEX17A
Instrument ID: GCHP17

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

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

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	82

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

SEQUOIA ANALYTICAL - ELAP #1210

Eileen Manning
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Project ID:	330-109.5A/4931, Oakland	
2025 Gateway Place, Suite 440	Matrix:	LIQUID	
San Jose, CA 95110			
Attention: Maree Doden	Work Order #:	9411201 01	Reported: Nov 15, 1994

COC #:

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC110494BTEX02A	GC110494BTEX02A	GC110494BTEX02A	GC110494BTEX02A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	N.A.	N.A.	N.A.	N.A.
Analyst:	J. Minkel	J. Minkel	J. Minkel	J. Minkel
MS/MSD #:	9410I5401	9410I5401	9410I5401	9410I5401
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	N.A.	N.A.	N.A.	N.A.
Analyzed Date:	11/4/94	11/4/94	11/4/94	11/4/94
Instrument I.D.#:	GCHP2	GCHP2	GCHP2	GCHP2
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	11	11	11	33
MS % Recovery:	110	110	110	110
Dup. Result:	11	11	11	33
MSD % Recov.:	110	110	110	110
RPD:	0.0	0.0	0.0	0.0
RPD Limit:	0-50	0-50	0-50	0-50

LCS #:				
Prepared Date:				
Analyzed Date:				
Instrument I.D.#:				
Conc. Spiked:				
LCS Result:				
LCS % Recov.:				
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

Eileen A. Manning
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

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Project ID:	330-109.5A/4931, Oakland	
2025 Gateway Place, Suite 440	Matrix:	LIQUID	
San Jose, CA 95110			
Attention: Maree Doden	Work Order #:	9411201 02	Reported: Nov 15, 1994

COC #:

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC110794BTEX17A	GC110794BTEX17A	GC110794BTEX17A	GC110794BTEX17A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	N.A.	N.A.	N.A.	N.A.
Analyst:	J. Minkel	J. Minkel	J. Minkel	J. Minkel
MS/MSD #:	941005302	941005302	941005302	941005302
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	N.A.	N.A.	N.A.	N.A.
Analyzed Date:	11/7/94	11/7/94	11/7/94	11/7/94
Instrument I.D.#:	GCHP2	GCHP2	GCHP2	GCHP2
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	10	10	10	30
MS % Recovery:	100	100	100	100
Dup. Result:	10	10	9.8	29
MSD % Recov.:	100	100	98	97
RPD:	0.0	0.0	2.0	3.4
RPD Limit:	0-50	0-50	0-50	0-50

LCS #:				
Prepared Date:				
Analyzed Date:				
Instrument I.D.#:				
Conc. Spiked:				
LCS Result:				
LCS % Recov.:				

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

Eileen A. Manning
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
REC. BY (PRINT): N.L.

WORKORDER: 9411201
DATE OF LOG-IN: 11/3/94

CIRCLE THE APPROPRIATE RESPONSE

1. Custody Seal(s) — Present / (Absent)
2. Custody Seal Nos.: — Intact / Broken*
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 on custody reports, traffic reports and sample tags agree? — (Yes) / No*
10. Proper preservatives used: — (Yes) / No*
11. Date Rec. at Lab: 11/2/94
12. Temp. Rec. at Lab: 8° C
13. Time Rec. ar Lab: 12:54

LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION(ETC.)
01	A/C	EFFL	3 VOAs	L	10/31	
02	B	INFL	1	L	↓	

N.L. 11/2/94

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

ARCO Products Company ◆ Division of AtlanticRichfieldCompany — 330-109.5A — Task Order No. 4931-94-5A — **Chain of Custody**

ARCO Facility no. 4931	City (Facility) Oakland	Project manager (Consultant) Shaw Groskopf	Laboratory name Sequoia
ARCO engineer Michael Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) (408) 441-7500	Fax no. (Consultant) (408) 441-7539
Consultant name Pacific Environmental Group	Address (Consultant) 2025 Gateway Place Suite 440 San Jose CA 95110		Contract number 9411201

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 ☐		
EFFL		3		X		X	X		17:10		X	X			-01							
INFL		3		X		X	X	11-1-94	17:15		↓	X			-02							
												MH										

Special detection Limit/reporting

Special QA/QC

Remarks

12

Lab number 9411201

Turnaround time

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

Condition of sample:

Temperature received:

	Date	Time		Date	Time
Relinquished by sampler	11-1-94	7:25	Received by	11/2/94	0730
Relinquished by	11/2/94	11:00	Received by		
Relinquished by	11/2/94	12:50	Received by laboratory	11/2/94	12:54

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

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
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

Project: 330-109.5A/4931, Oakland

Enclosed are the results from samples received at Sequoia Analytical on November 10, 1994. The requested analyses are listed below:

SAMPLE #	SAMPLE DESCRIPTION	DATE COLLECTED	TEST METHOD
9411796 -01	LIQUID, Infl	11/09/94	TPHGBW Purgeable TPH/BTEX
9411796 -02	LIQUID, Mid-1	11/09/94	TPHGBW Purgeable TPH/BTEX
9411796 -03	LIQUID, Mid-2	11/09/94	TPHGBW Purgeable TPH/BTEX
9411796 -04	LIQUID, Effl	11/09/94	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

Eileen Manning
Project Manager

Quality Assurance Department

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Proj. ID: 330-109.5A/4931, Oakland	Sampled: 11/09/94
2025 Gateway Place, Suite 440	Sample Descript: Infl	Received: 11/10/94
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 11/14/94
Attention: Maree Doden	Lab Number: 9411796-01	Reported: 11/22/94

QC Batch Number: GC111494BTEX02A
Instrument ID: GCHP2

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	56
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	**0.50**	**2.7**
Chromatogram Pattern:		
Weathered Gas		C7-C12

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	106

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

SEQUOIA ANALYTICAL - ELAP #1210

Eileen Manning
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Proj. ID: 330-109.5A/4931, Oakland	Sampled: 11/09/94
2025 Gateway Place, Suite 440	Sample Descript: Mid-1	Received: 11/10/94
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 11/14/94
Attention: Maree Doden	Lab Number: 9411796-02	Reported: 11/22/94

QC Batch Number: GC111494BTEX02A
Instrument ID: GCHP2

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	97

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

SEQUOIA ANALYTICAL - ELAP #1210

Eileen Manning
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Proj. ID: 330-109.5A/4931, Oakland	Sampled: 11/09/94
2025 Gateway Place, Suite 440	Sample Descript: Mid-2	Received: 11/10/94
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 11/14/94
Attention: Maree Doden	Lab Number: 9411796-03	Reported: 11/22/94

QC Batch Number: GC111494BTEX02A
Instrument ID: GCHP2

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	98

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

SEQUOIA ANALYTICAL - ELAP #1210

Eileen Manning
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Proj. ID: 330-109.5A/4931, Oakland	Sampled: 11/09/94
2025 Gateway Place, Suite 440	Sample Descript: Effl	Received: 11/10/94
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 11/14/94
Attention: Maree Doden	Lab Number: 9411796-04	Reported: 11/22/94

QC Batch Number: GC111494BTEX02A
Instrument ID: GCHP2

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	99

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

SEQUOIA ANALYTICAL - ELAP #1210

Eileen Manning
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
1900 Bates Avenue, Suite L, Concord, CA 94520, (510) 686-9600, FAX (510) 686-9689
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: 330-109.5A/4931, Oakland
Matrix: Liquid
Work Order #: 9411796 01-04

Reported: Nov 22, 1994

COC #:

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC111494BTEX02A	GC111494BTEX02A	GC111494BTEX02A	GC111494BTEX02A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	N.A.	N.A.	N.A.	N.A.
Analyst:	J. Minkel	J. Minkel	J. Minkel	J. Minkel
MS/MSD #:	941171003	941171003	941171003	941171003
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	N.A.	N.A.	N.A.	N.A.
Analyzed Date:	11/14/94	11/14/94	11/14/94	11/14/94
Instrument I.D.#:	GCHP2	GCHP2	GCHP2	GCHP2
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	10	10	10	31
MS % Recovery:	100	100	100	103
Dup. Result:	11	11	11	32
MSD % Recov.:	110	110	110	107
RPD:	9.5	9.5	9.5	3.2
RPD Limit:	0-50	0-50	0-50	0-50

LCS #:				
Prepared Date:				
Analyzed Date:				
Instrument I.D.#:				
Conc. Spiked:				
LCS Result:				
LCS % Recov.:				

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

Eileen A. Manning
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
REC. BY (PRINT): SL

WORKORDER: 9411796
DATE OF LOG-IN: 11/12/94

CIRCLE THE APPROPRIATE RESPONSE

1. Custody Seal(s) — Present / Absent
2. Custody Seal Nos.: — Intact / Broken*
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 on custody reports, traffic reports and sample tags agree? — Yes / No*
10. Proper preservatives used: — Yes / No*
11. Date Rec. at Lab: 11.10.94
12. Temp. Rec. at Lab: 15°C
13. Time Rec. ar Lab: 1230

LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION(ETC.)
1	A-C	INFL	3VOA	W	11.9	
2		MID-1				
3		MID-2				
4		EFF1				

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

Revision 10/10/94

ARCO Products Company
Division of AtlanticRichfieldCompany

330-109.5A Task Order No. 4931-94-5A

Chain of Custody

ARCO Facility no. 4931	City (Facility) OAKLAND	Project manager (Consultant) Shaw Gaiakani	Laboratory name Sequoia
ARCO engineer Mike Whelan	Telephone no. (ARCO)	Telephone no. (Consultant) 408 441 7500	Fax no. (Consultant) 4084417539
Consultant name Pacific Env Group	Address (Consultant) 2025 Gateway Pl #440 San Jose		Contract number 07073

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 ☐		
INFL	7	3		X		X	HCL	11-9-94			X										-01	
MID-1		↓		↓		↓	↓	↓			↓										-02	
MID-2																					-03	
EFFL																					-04	

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number 9411796

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: Good

Temperature received: 15°C

	Date	Time		Date	Time
Relinquished by sampler	11-10-94	7:00	Received by Denise Alarcon	11/10/94	9:30
Relinquished by Denise Alarcon	11/10/94	11:50	Received by	11/10/94	11:50
Relinquished by	11/10/94	12:30	Received by laboratory	11-10-94	1230

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

APPC-3292 (2-91)

1487

FIELD SERVICES/O and M REQUEST

Work Order # 00489

SITE INFORMATION FORM

Identification

ject # 330-109.5A
4931

Station #

Site Address: 751 MACARTHUR BLVD

County: ALAMEDA

Project Manager: SAM G.

Requestor: ERIC WINGFIELD

Client: ARCO

Client P.O.C.: MICHAEL WHELAN

Date of request: 10/26/94

Project Type

- ☐ 1st Time visit
- ☐ Quarterly
  - ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th
- ☒ Monthly
- ☐ Semi-Monthly
- ☐ Weekly
- ☐ One time event
- ☐ Other:

Ideal field date(s): ASAP

	Initials	Date	Check Appropriate Category
Circle Appropriate Category		11/2	
F/S In Budget Site Visit		11/4	Budget Hrs.
O = In Budget Site Visit			Actual Hrs. 3
S = In Budget Site Visit			Mob de Mob 1

Copy/Dist.

Site Safety Concerns

Field Tasks: For General Description

TURN SYSTEM ON
RUN FOR 1 HOUR

SAMPLE ~~INF1, MID1, MID2, MID3~~ EFL, INFL
ATEXTANK

TAKE TOTALIZER READING ~~43~~
43 1128 At 17:22

~~Hach~~ ~~Data~~
Sibert Nicht 4 Channel Digital Communicator
model 1410

Acct 436
National Guardian 1800 413 4085
Unit # 0533 436 Telephone # 601-8811

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

System on on arrival RW 1 and 2 on Product Pump
RW 3 and 4 OFF

MR 755 55 1755 90 330

Completed by: PP Date: 10-31-94

Checked by:

PACIFIC ENVIRONMENTAL GROUP, INC.

White Copy - Originator Yellow Copy - O & M Tech Pink Copy - File

FIELD SERVICES/O and M REQUEST Work Order # 00800

SITE INFORMATION FORM

Identification

Project # 330-109.5A
Station # 4931
Site Address: 721 MACARTHUR
County: ALAMEDA
Project Manager: SHAW C.
Requestor: ERIC WINGFIELD
Client: ARCO
Client P.O.C.: MICHAEL WHELAN
Date of request: 10/21/94

Project Type

- ☐ 1st Time visit
- ☒ Quarterly ☐ 1st ☐ 2nd ☐ 3rd ☒ 4th
- ☐ Monthly
- ☐ Semi-Monthly
- ☐ Weekly
- ☐ One time event
- ☐ Other:

Ideal field date(s): MUST BE DONE WEEK of NOV 7 TO BE IN COMPLIANCE

Circle Appropriate Category
I = In Budget Site Visit
O = In Budget Site Visit
S = In Budget Site Visit

Check Appropriate Category
Budget Hrs. ____
Actual Hrs. 2.5
Mob de Mob 1.5

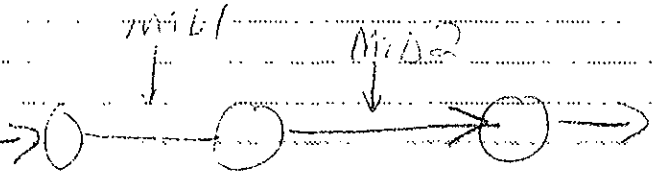
Initials	Date
Site Safety	
Concerns F/S	RY 11/21/94
Copy/Dist.	da 11/22

Field Tasks: For General Description

MID 1

- SAMPLE: INFL, EFFL, MID2 FOR TPH-G & BTEX.
- FLOW NOT TO EXCEED 6 gpm
- TAKE TOTALIZER READING
- Complete Field data Sheet

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



Sampled System

PACIFIC ENVIRONMENTAL GROUP, INC.

Completed by: JV Date: 11-9-94
Checked by: ____

Groundwater Extraction System
ARCO Service Station
4931

Revised: January 31, 1994

Name: JV Date/Time: 11-9-94 9:20

TREATMENT SYSTEM READINGS			
System Operational Upon Arrival?	Yes	Hour Meter (hours)	75794
Does Auto-dialer Dial Out?	N/A	Do Float Switches Work?	NO pad Float Switches
Sewer Level Overflowing?	NO	Number of Spare Filters on Site?	10
~~Effluent Totalizer~~ System totalizer (gallons)	433050	~~Effluent~~ System Flowrate (gpm) when ON	5.4
~~E-1~~ A-9 Flowrate ~~Rotometer~~ (gpm)	5.4	~~E-2 Flowrate Rotometer (gpm)~~	N/A
Bag Filter INFL Pressure (psi)	5	Bag Filter EFFL Pressure (psi)	5
Carbon MID-1 Pressure (psi)	0	Carbon MID-2 EFFL Pressure (psi)	0
Carbon EFFL Pressure (psi)	0	Transfer Pump EFFL Pressure (psi)	N/A
All Visible Leaks Repaired?	Yes	System Enclosure Swept?	
Sump Pump Operational?	NO Sump pump	High Level Alarm Tripped?	N/A
LEL Reading (%)	NO LEL meter	Containment Pad?	

EXTRACTION WELL READINGS			
Well	A-9 ~~E-1~~	E-2	EW-1
Pump Operating?	Yes		NA
Totalizer (gallons)	433050		NA
Flowrate (gpm)	5.4		NA
Hour Meter (hours)	N/A		NA
Well Pressure (psi)	N/A		NA
Pump Current (amp)	1.0		NA

FIELD DATA SHEET

Client: ARCO

Date: 11-9-94

Project No.: 330 109.5A

Job Address: 731 MACARTHUR
OAKLAND

Time Arrived:

Time Departed:

Weather Conditions:

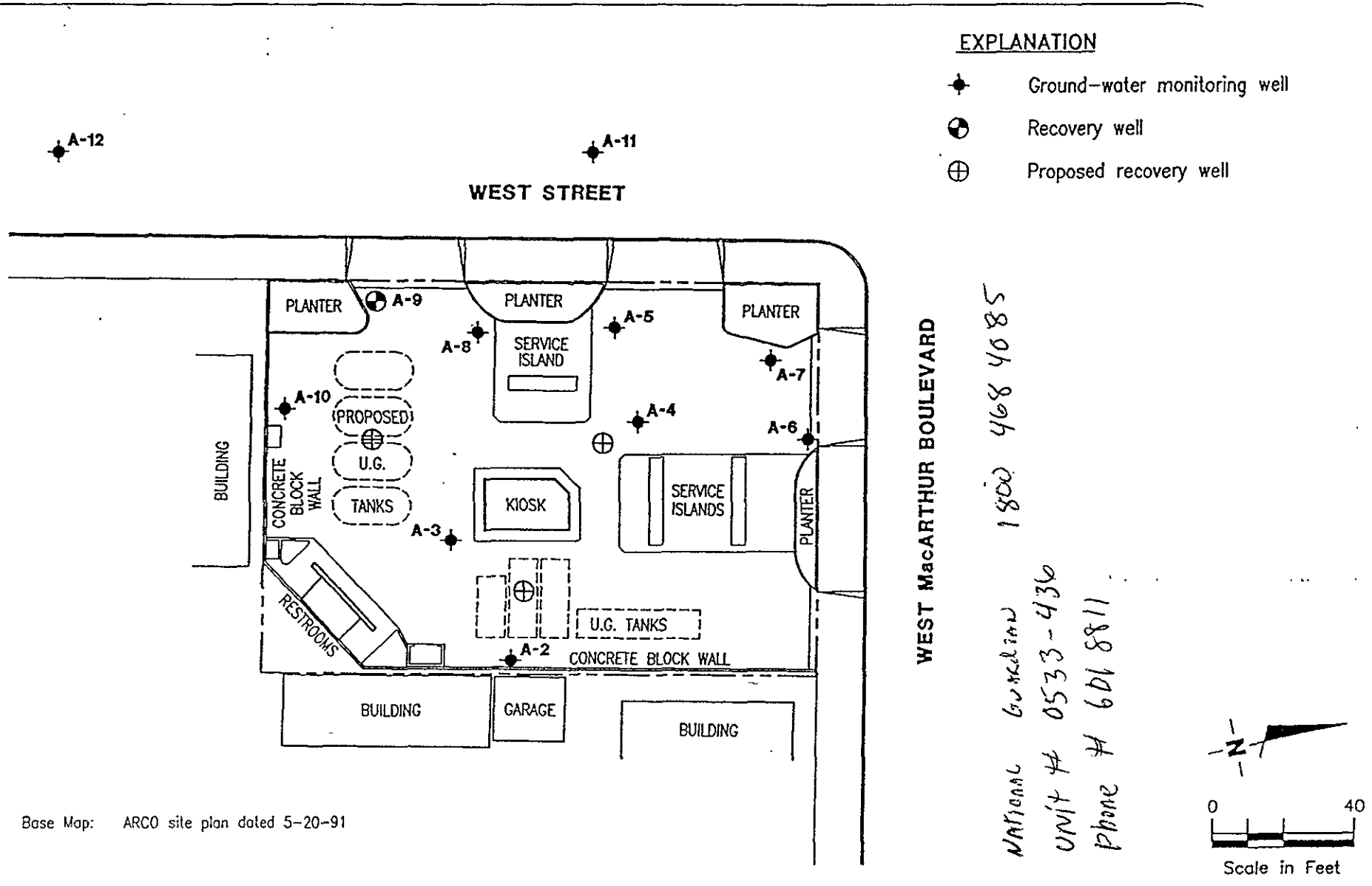
Equipment at Site:

Personnel at Site:

FIELD NOTES

Check out system, Every thing Seem to Be ok, Need To bring Fire Ext & Site SAFTY PLAN And 330 Sign, NO Auto Dialer But it HAS A Silent Night system there And is Hook up with National Guardian # 1-800 468 4085 unit # 0533-436 And phone # For site is 601-8811 NO Sump pump

Signature



Base Map: ARCO site plan dated 5-20-91

National Guardian 1800 468 4685
Unit # 0533-436
Phone # 601 8811

GeoStrategies Inc.

SITE PLAN
ARCO Service Station #4931
731 West MacArthur Boulevard
Oakland, California

PLATE 2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
790901-14A	CMG	1/92	

ARCO oducts Company Division of AtlanticRichfieldCompany

330-109.5A **Task Order No.** 4931-94-5A

Ch. .n 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) 4084417539
Consultant name PACIFIC ENV GROUP	Address (Consultant) 2025 GATEWAY PL #440 SAN JOSE		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 ☐		
INFL		3		X		X	HCL	11-9-94			X											
M.D.1		↓		↓		↓	↓	↓			↓											
MID-2																						
EFFL																						

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number

Method of shipment

Turnaround time

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

Condition of sample.		Temperature received:	
Relinquished by sampler	Date 11-10-94 Time 7:00	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

FIELD SERVICES / O&M REQUEST

Work Order # 2647

SITE INFORMATION FORM

Identification

Project # 330-109.5A

Station # 4931

Site Address: 731 W. MacArthur Blvd. Oakland

County: Alameda

Project Manager: Shaw G.

Requestor: Eric W.

Client: ARCO

Client P.O.C.: Mike Whelan

Date of request: Dec. 7, 1994

Project Type

- ☐ 1st Time visit
- ☐ Quarterly
  - ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th
- ☒ Monthly
- ☐ Semi-Monthly
- ☐ Weekly
- ☐ One time event
- ☐ Other:

Ideal field date(s): This week or next

Prefield Contacts/Permits

	Initials	Date
☐ Ca Trans		
☐ Coun F/S	RH	12/14/94
☐ City		
☐ Private Copy/Dist.	RH	↓
☐ Multi-Consultant Scheduling date(s):		

Check Appropriate Category

Budget Hrs. ____

Actual Hrs. 2.5

Mob de Mob 2

Field Tasks: For General Description

System Sampling:

	A	B	C	D
(1) Gas/BTEX	Q	Q	Q	Q

(2) Fill out attached Data Sheet Monthly

(3) Check for Prop 65 Sign, Fire Extinguishers and Emergency Sign

A = ~~Eff~~ Effluent
B = Midpoint 2
C = Midpoint 1
D = Influent

Q = Week of Nov. 8
January 10
April 11
July 12

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

Influent → D → C → B → A → to Sewer

Monthly Completed
XO Samples taken

Completed by: JV Date: 12-16-94

Checked by: ____

PACIFIC ENVIRONMENTAL GROUP, INC.

White Copy - Originator Yellow Copy - O & M Tech Pink Copy - File

Groundwater Extraction System

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

Name: SV Date/Time: 12-19-94

Treatment System Readings			
System On Upon Arrival?	NO power outage	Electric Meter (kw-hrs)	76347
Effluent Totalizer (gallons)	435278	Effluent Flowrate (gpm)	3.6
A-9 ~~AR-1~~ Totalizer (gallons)	Same ↑	Bag Filter INFL Pressure (psi)	5
A-9 ~~AR-1~~ Flowrate (gpm)	3.6	Bag Filter EFFL Pressure (psi)	4
A-9 ~~AR-1~~ Hourmeter (hours)	N/A	MID Pressure (psi)	0
A-9 ~~AR-1~~ Throttle Valve Position	cracked	EFFL Pressure (psi)	0
AR-2 Totalizer (gallons)	—	Does Sump Pump Work	N/A
AR-2 Flowrate (gpm)	—	Number of Spare Filters On-Site	9
AR-2 Hourmeter (hours)	—	Enclosure Swept and Bleached?	Yes
AR-2 Throttle Valve Position	—		
Does the Autodialer Work? Batteries Replaced	—		

Comments _____

Distrubute a copy of this form to the project supervisor.