PACIFIC
ENVIRONMENTAL
GROUP, INC.

April 12, 1995
Project 330-110.2A

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

Re: Quarterly Report - Fourth Quarter 1994
Remedial System Performance Evaluation
ARCO Service Station 5387
20200 Hesperian Boulevard at West Sunset Drive
Hayward, California

Dear Mr. Whelan:

This letter, prepared by Pacific Environmental Group, Inc. (PACIFIC) on behalf of ARCO Products Company (ARCO), presents the results of the fourth quarter 1994 groundwater monitoring and performance evaluation of the soil vapor extraction (SVE) and air sparging 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 (IWM) on November 18, 1994, and analyzed for the presence of total petroleum hydrocarbons calculated as gasoline (TPH-g), benzene, toluene, ethylbenzene, and xylenes (BTEX compounds). Certified analytical reports, chain-of-custody documentation, and field data sheets are presented as Attachment A. IWM's sampling procedures are presented as Attachment B.

Depth to water data collected on November 18, 1994, indicate that groundwater levels across the ARCO site have risen an average of 0.49 foot since August 17, 1994. Groundwater flow across the area was to the west with an approximate gradient of 0.003. This flow direction and gradient are consistent with historical data. Liquid surface elevation data are presented in Table 1. A liquid surface elevation contour map based on the November 18, 1994 data is shown on Figure 1.

TPH-g and benzene were not detected in Wells A-6, A-9, and A-10 during the November 18, 1994 sampling event. TPH-g was not detected in Well A-8. TPH-g concentra-

tions in other site wells ranged from 98 to 14,900 parts per billion (ppb). Benzene concentrations in other site wells ranged from 0.6 to 720 ppb. Separate-phase hydrocarbons were not observed in any site well this quarter, or during any previous sampling event. Groundwater analytical data are presented in Table 2. A TPH-g and benzene concentration map is shown on Figure 2.

To fulfill the requirements of the City of Hayward Fire Department, wells on four adjacent facilities were also gauged and sampled on November 16, 1994. Samples collected by IWM from the ARCO site were inadvertently collected out of schedule with these other events. Liquid surface elevation data and groundwater analytical data for the adjacent facilities are presented in Tables 3 and 4, respectively. The aforementioned data are also shown on the liquid surface elevation contour map and the TPH-g and benzene concentration map (Figures 1 and 2, respectively). The groundwater analytical data for the adjacent facilities are presented as Attachment C.

REMEDIAL PERFORMANCE EVALUATION

Remedial action consisting of SVE and air sparging has been intermittently in progress at the site since February 15, 1994. PACIFIC assumed environmental consulting responsibility from GeoStrategies, Inc. on September 1, 1994.

A brief description of the remedial system, and an evaluation of its performance from September 30 through December 31, 1994 is presented below.

SOIL VAPOR EXTRACTION SYSTEM

Soil Vapor Extraction System Description

The current SVE system is comprised of six SVE wells (MW-1, MW-3, AV-1, AV-3, AV-4, and AS-1), a 5-horsepower vapor extraction blower, and three 1,000-pound granular activated carbon (GAC) vessels connected in series. The current SVE system is permitted by the Bay Area Air Quality Management District (BAAQMD) (Permit to Operate 11813). The permit is effective through April 5, 1995.

Soil Vapor Extraction System Mass Removal

During the reporting period, the SVE system removed approximately 9.8 pounds (1.6 gallons) of TPH-g and 0.05 pound (0.01 gallon) of benzene from impacted soil beneath the site. To date, according to available data, the SVE system has removed approximately 115.4 pounds (18.9 gallons) of TPH-g and 1.40 pounds (0.19 gallon) of benzene from impacted soil and groundwater beneath the site. SVE system operational and analytical data are presented as Attachment D. SVE mass removal data are presented in Table 5 and shown on Figures 3 and 4.

Progress toward site remediation is presented in the table below.

	Mass Removed			
	11/02/94		Cumulative	
	(lbs)	(gal)	(lbs)	(gal)
TPH-g	9.8	1.6	115.4	18.9
Benzene	0.05	0.01	1.40	0.19

lbs = Pounds
gal = Gallons
TPH-g = Total petroleum hydrocarbons calculated as gasoline

Soil Vapor Extraction System Operational Data

During the reporting period the SVE system was started up and operated for approximately 2.5 hours in order to evaluate hydrocarbon mass removal rate. Based on relatively high hydrocarbon mass removal encountered during the start-up period the system was shut down for further testing with an internal combustion engine as an abatement device.

AIR SPARGE SYSTEM

Air Sparging System Description

The air sparging system is comprised of nine air sparge wells (AS-1 through AS-9) and a 3-horsepower oiless pressure blower. The air sparging system operates in conjunction with the SVE system.

Air Sparging System Operational Data

During the reporting period, the SVE system was inoperative; therefore, the air sparging system was also not operated.

CONCLUSIONS

Groundwater elevation data for the ARCO site indicate that the groundwater flow has been toward the west since early 1992. Groundwater elevation data, consistently collected during the fourth quarter 1994 coordinated monitoring event from adjacent sites (ARCO, Alliance, Shell, Texaco, and Unocal service stations), indicate that the regional groundwater flow direction is toward the west, and is consistent with the ARCO site data. Additionally, based on the westerly regional groundwater flow direction, there are two separate hydrocarbon plumes; the ARCO hydrocarbon plume and the hydrocarbon plume located at the intersection of West "A" Street and Hesperian Boulevard (Alliance, Shell, Texaco, and Unocal service stations). Therefore, based on the consistent groundwater flow direction to the west and the fact that the ARCO plume is a separate plume from the plume originating from the service stations in this area, ARCO will discontinue coordinated groundwater monitoring beginning with the first quarter 1995.

As of January 1995, the service station operation and environmental responsibility has been transferred from ARCO to Thrifty Oil Company. This fourth quarter report completes ARCO's and PACIFIC's involvement with the station.

SUMMARY OF WORK

Work Completed Fourth Quarter 1994

- Sampled site wells for fourth quarter 1994 groundwater monitoring program. Sampling was performed by IWM.
- Switched SVE system abatement device from internal combustion engine to GAC vessels.
- Restartup of the SVE system and evaluation of the abatement device.
- Liaison with the BAAQMD regarding change of abatement device.

Work Anticipated First Quarter 1995

- Preparation and submittal of fourth quarter 1994 groundwater monitoring and remedial system performance evaluation report.
- Transfer site responsibility to Thrifty Oil Company under agreement with ARCO.

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

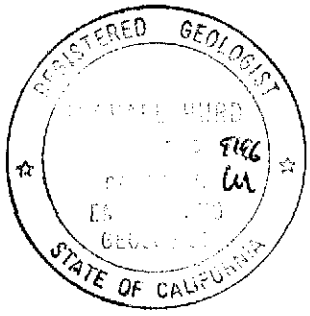
Sincerely,

Pacific Environmental Group, Inc.

Kelly C. Brown for

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 - Liquid Surface Elevation Data - Adjacent Facilities
Table 4 - Groundwater Analytical Data - Adjacent Facilities Total Petroleum Hydrocarbons (TPH as Gasoline, BTEX Compounds, and TPH as Diesel)
Table 5 - Soil Vapor Extraction System Performance Data
Figure 1 - Liquid Surface Elevation Contour Map
Figure 2 - TPH-g/Benzene Concentration Map
Figure 3 - Soil Vapor Extraction System Mass Removal Data
Figure 4 - Soil Vapor Extraction System Hydrocarbon Concentrations
Attachment A - Certified Analytical Reports, Chain-of-Custody Documentation, and Field Data Sheets
Attachment B - Groundwater Sampling Procedures
Attachment C - Groundwater Analytical Results from Adjacent Site
Attachment D Soil Vapor Extraction System Performance Data

cc: Ms. Juliet Shin, Alameda County Health Care Services Agency
Mr. Richard Hiett, Regional Water Quality Control Board - S.F. Bay Region
Mr. Hugh Murphy, City of Hayward Fire Department - Hazardous Materials Division

Table 1

Liquid Surface Elevation Data

ARCO Service Station 5387

20200 Hesperian Boulevard at West Sunset Drive

Hayward, California

Well Number	Date Gauged	Well Elevation (feet, MSL)		Depth to Water (feet, TOC)	Groundwater Elevation (feet, MSL)
MW-1	08/08/86	38.36	*	11.25	27.11
	12/24/91		*	16.12	22.24
	03/10/92		*	13.34	25.02
	06/09/92		*	14.12	24.24
	09/14/92		*	15.34	23.02
	11/12/92		*	15.46	22.90
	02/11/93		*	11.95	26.41
	04/14/93		*	11.65	26.71
	08/12/93		*	12.93	25.43
	10/26/93		*	14.13	24.23
	02/16/94	37.26		11.86	25.40
	05/03/94			11.58	25.68
	08/17/94	37.33		12.78	24.55
	11/18/94			12.31	25.02
MW-2	08/08/86	38.58	*	11.62	26.96
	12/24/91		*	16.50	22.08
	03/10/92		*	13.50	25.08
	06/09/92		*	14.52	24.06
	09/14/92		*	15.78	22.80
	11/12/92		*	15.98	22.60
	02/11/93		*	12.27	26.31
	04/14/93		*	12.01	26.57
	08/12/93		*	13.81	24.77
	10/26/93		*	14.53	24.05
	02/16/94	37.99		12.81	25.18
	05/03/94			12.63	25.36
	08/17/94	38.06		13.69	24.37
	11/18/94			13.18	24.88
MW-3	08/08/86	37.77	*	10.61	27.16
	12/24/91		*	15.60	22.17
	03/10/92		*	12.90	24.87
	06/09/92		*	13.60	24.17
	09/14/92		*	14.78	22.99
	11/12/92		*	14.92	22.85
	02/11/93		*	11.65	26.12
	04/14/93		*	11.16	26.61
	08/12/93		*	12.82	24.95
	10/26/93		*	13.60	24.17
	02/16/94	36.80		11.53	25.27
	05/03/94			11.36	25.44
	08/17/94	36.87		12.38	24.49
	11/18/94			11.93	24.94

Table 1 (continued)

Liquid Surface Elevation Data

ARCO Service Station 5387

20200 Hesperian Boulevard at West Sunset Drive

Hayward, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Water (feet, TOC)	Groundwater Elevation (feet, MSL)
A-4	12/24/91	39.86 *	17.60	22.26
	03/10/92	*	14.76	25.10
	06/09/92	*	15.63	24.23
	09/14/92	*	16.83	23.03
	11/12/92	*	16.97	22.89
	02/11/93	*	13.43	26.43
	04/14/93	*	13.06	26.80
	08/12/93	*	14.94	24.92
	10/26/93	*	15.52	24.34
	02/16/94	39.46	14.02	25.44
	05/03/94		13.85	25.61
	08/17/94	39.53	14.95	24.58
	11/18/94		14.46	25.07
A-5	12/24/91	38.94 *	16.85	22.09
	03/10/92	*	13.83	25.11
	06/09/92	*	14.91	24.03
	09/14/92	*	16.14	22.80
	11/12/92	*	16.35	22.59
	02/11/93	*	13.21	25.73
	04/14/93	*	12.97	25.97
	08/12/93	*	14.12	24.82
	10/26/93	*	14.72	24.22
	02/16/94	38.47	13.20	25.27
	05/03/94		13.08	25.39
	08/17/94	38.54	14.18	24.36
	11/18/94		13.73	24.81
A-6	12/24/91	39.07 *	16.88	22.19
	03/10/92	*	13.73	25.34
	06/09/92	*	14.95	24.12
	09/14/92	*	16.20	22.87
	11/12/92	*	16.35	22.72
	02/11/93	*	13.04	26.03
	04/14/93	*	12.23	26.84
	08/12/93	*	14.18	24.89
	10/26/93	*	14.85	24.22
	02/16/94	*	NM	NM
	05/03/94	*	13.66	25.41
	08/17/94	38.78	14.34	24.44
	11/18/94		13.76	25.02

Table 1 (continued)
Liquid Surface Elevation Data

ARCO Service Station 5387
20200 Hesperian Boulevard at West Sunset Drive
Hayward, California

Well Number	Date Gauged	Well Elevation (feet, MSL)		Depth to Water (feet, TOC)	Groundwater Elevation (feet, MSL)
A-7	12/24/91	39.95	*	18.11	21.84
	03/10/92		*	15.30	24.65
	06/09/92		*	16.12	23.83
	09/14/92		*	17.35	22.60
	11/12/92		*	17.47	22.48
	02/11/93		*	13.80	26.15
	04/14/93		*	13.60	26.35
	08/12/93		*	15.54	24.41
	10/26/93		*	16.28	23.67
	02/16/94	39.38		14.44	24.94
	05/03/94			14.34	25.04
	08/17/94	39.45		15.40	24.05
	11/18/94			14.95	24.50
A-8	09/14/92	37.23	*	14.19	23.04
	11/12/92		*	14.35	22.88
	02/11/93		*	11.25	25.98
	04/14/93		*	12.33	24.90
	08/12/93		*	12.41	24.82
	10/26/93		*	13.02	24.21
	02/16/94	36.76		11.47	25.29
	05/03/94			11.35	25.41
	08/17/94	36.84		12.34	24.50
	11/18/94			11.90	24.94
A-9	09/14/92	38.71	*	16.12	22.59
	11/12/92		*	16.29	22.42
	02/11/93		*	12.31	26.40
	04/14/93		*	12.01	26.70
	08/12/93		*	13.90	24.81
	10/26/93		*	14.86	23.85
	02/16/94	38.19		12.99	25.20
	05/03/94			NM	NM
	08/17/94	38.24		14.03	24.21
	11/18/94			13.44	24.80
A-10	12/07/92	38.94	*	16.81	22.13
	02/11/93		*	13.15	25.79
	04/14/93		*	12.93	26.01
	08/12/93		*	14.87	24.07
	10/26/93		*	15.65	23.29
	02/16/94	38.66		14.16	24.50
	05/03/94			14.00	24.66
	08/17/94	38.72		15.08	23.64
	11/18/94			14.68	24.04

Table 1 (continued)

Liquid Surface Elevation Data

ARCO Service Station 5387
20200 Hesperian Boulevard at West Sunset Drive
Hayward, California

Well Number	Date Gauged	Well Elevation (feet, MSL)		Depth to Water (feet, TOC)	Groundwater Elevation (feet, MSL)
AR-1	09/14/92	38.11	*	15.21	22.90
	11/12/92		*	15.36	22.75
	02/11/93		*	12.81	25.30
	04/14/93		*	11.77	26.34
	08/12/93		*	13.55	24.56
	10/26/93		*	13.98	24.13
	02/16/94	37.46		12.15	25.31
	05/03/94			12.03	25.43
	08/17/94	37.33		12.92	24.41
	11/18/94			12.41	24.92
AR-2	03/30/93	38.39	*	11.53	26.86
	04/14/93		*	11.87	26.52
	08/12/93		*	13.59	24.80
	10/26/93		*	14.25	24.14
	02/16/94	37.98		12.76	25.22
	05/03/94			12.60	25.38
	08/17/94	38.18		13.86	24.32
	11/18/94			13.33	24.85

MSL = Mean sea level
TOC = Top of casing
* = Measurement taken from top of well box
NM = Not monitored

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

ARCO Service Station 5387
20200 Hesperian Boulevard at West Sunset Drive
Hayward, California

Well Number	Date Sampled	TPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	
MW-1	08/08/86	7,040	132	8.7	439	230	
	12/24/91	2,200	190	8.5	6.9	2.6	
	03/10/92	2,800	270	29	56	39	
	06/09/92	2,900	960	27	99	63	
	09/14/92	2,600	450	<5.0	45	21	
	11/12/92	1,600	310	7.2	22	8.9	
	02/11/93	4,000	510	47	200	91	
	04/14/93	1,700	260	20	100	70	
	08/12/93	830	60	3.8	39	3.6	
	10/26/93	8,800	140	<10	41	<10	
	02/17/94	1,200	130	12	54	58	
	05/03/94	NA	NA	NA	NA	NA	
	08/17/94	3,900	86	5.1	78	9.4	
	11/18/94	6,350	112	8.4	107	35	
MW-2	08/08/86	1,910	20.1	2.8	1.8	NA	
	12/24/91	23,000	1,500	1,100	480	1,400	
	03/10/92	210,000	44,000	3,900	1,700	5,800	
	06/09/92	33,000	2,300	370	780	2,600	
	09/14/92	16,000	3,700	100	470	1,000	
	11/12/92	16,000	3,800	86	470	910	
	02/11/93	27,000	3,500	720	1,600	3,800	
	04/14/93	27,000	3,500	220	2,200	5,100	
	08/12/93	16,000	1,600	27	1,300	1,200	
	10/26/93	12,000	1,200	<25	510	330	
	02/17/94	15,000	1,800	21	850	540	
	05/03/94	NA	NA	NA	NA	NA	
	08/17/94	14,000	850	13	640	270	
	8/17/94(D)	14,000	860	14	650	280	
	11/18/94	14,900	640	3.4	532	156	
	11/18/94(D)	14,500	680	6.1	528	155	
MW-3	08/08/86	7,450	510	549	409	1,380	
	12/24/91	6,800	450	10	610	45	
	03/10/92	11,000	2,500	75	400	560	
	06/09/92	16,000	2,000	69	1,300	2,600	
	09/14/92	14,000	630	<50	1,500	2,400	
	11/12/92	7,400	400	<25	860	330	
	02/11/93	8,600	580	<20	710	300	
	04/14/93	6,900	300	8.8	580	99	
	08/12/93	3,400	56	< 5	190	<5	
	10/26/93	2,900	42	<10	76	<10	
	02/17/94	3,100	160	<10	36	8.6	
	05/03/94	2,300	44	<2.5	8.0	<2.5	
	08/17/94	1,900	7.0	<9.5 *	4.4	<5 **	
	11/18/94	909	1.1	<0.5	0.9	4.0	
A-4	12/24/91	1,900	29	1.9	25	29	
	03/10/92	7,400	37	<0.60	11	73	
	06/09/92	4,500	3.2	1.5	37	16	
	09/14/92	1,300	<2.5	2.5	61	6.8	
	11/12/92	610	7.2	0.98	34	0.97	

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

ARCO Service Station 5387
20200 Hesperian Boulevard at West Sunset Drive
Hayward, California

Well Number	Date Sampled	TPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
A-4	02/11/93	740	2.4	<0.5	5	3.5
(cont.)	04/14/93	380	<0.5	<0.5	10	1.6
	08/12/93	1,200	0.93	<0.5	0.91	<0.5
	10/26/93	160	<0.5	<0.5	1.0	<0.5
	02/17/94	320	<0.5	<0.5	28	0.9
	05/03/94	130	<0.5	<0.5	1.1	<0.5
	08/17/94	62	<0.5	<0.5	<0.5	<0.5
	11/18/94	98	1.3	0.6	<0.5	<0.5
A-5	12/24/91	1,600	35	<0.30	32	52
	03/10/92	1,000	21	<1.5	43	100
	06/09/92	680	1.6	<0.3	14	16
	09/14/92	770	34	<2.5	51	65
	11/12/92	520	12	0.96	29	36
	02/11/93	150	3.0	<0.5	5.1	1.5
	04/14/93	190	1.6	<0.5	1.5	0.97
	08/12/93	230	5.4	<0.5	5.3	0.94
	10/26/93	190	1.7	<0.5	5.5	2.0
	02/17/94	340	2.8	<0.5	13	2.9
	05/03/94	170	<0.5	<0.5	4.0	1.9
	08/17/94	270	1.4	<0.5	7.3	1.1
	11/18/94	338	0.6	<0.5	4.6	<0.5
A-6	12/24/91	<30	<0.3	<0.3	<0.3	<0.3
	03/10/92	<30	<0.3	<0.3	<0.3	<0.3
	06/09/92	<30	<0.3	<0.3	<0.3	<0.3
	09/14/92	<50	<0.5	<0.5	<0.5	<0.5
	11/12/92	<50	<0.5	<0.5	<0.5	<0.5
	02/11/93	<50	<0.5	<0.5	<0.5	<0.5
	04/14/93	<50	<0.5	<0.5	<0.5	<0.5
	08/12/93	<50	<0.5	<0.5	<0.5	<0.5
	10/26/93	<50	<0.5	<0.5	<0.5	<0.5
	02/16/94	---------- Well Not Sampled ----------				
	05/03/94	<50	<0.5	<0.5	<0.5	<0.5
	08/17/94	<50	<0.5	<0.5	<0.5	<0.5
	11/18/94	<50	<0.5	<0.5	<0.5	<0.5
A-7	12/24/91	10,000	88	16	170	610
	03/10/92	320	9.3	0.54	8.8	34
	06/09/92	340	11	1.1	8.9	26
	09/14/92	510	12	<2.0	30	51
	11/12/92	760	17	0.83	50	73
	02/11/93	260	20	1.0	11	21
	04/14/93	1,300	89	2.1	48	87
	08/12/93	360	9.0	<0.50	13	9.0
	10/26/93	99	1.7	<0.50	4.0	3.0
	02/16/94	1,300	38	< 1	35	25
	05/03/94	330	8.1	<0.5	7.8	3.7
	08/17/94	350	2.2	<0.5	9.6	3.6
	11/18/94	412	1.3	<0.5	6.2	2.0
A-8	09/14/92	<50	<0.5	<0.5	<0.5	<0.5
	11/12/92	<50	<0.5	<0.5	<0.5	<0.5
	02/11/93	<50	<0.5	<0.5	<0.5	<0.5
	04/14/93	<50	<0.5	<0.5	<0.5	<0.5
	08/12/93	<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 5387
20200 Hesperian Boulevard at West Sunset Drive
Hayward, California

Well Number	Date Sampled	TPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)
A-8	10/26/93	<50	<0.5	<0.5	<0.5	<0.5
(cont.)	02/16/94	<50	<0.5	<0.5	<0.5	<0.5
	05/03/94	<50	<0.5	<0.5	<0.5	<0.5
	08/17/94	<50	<0.5	1.7	<0.5	1.4
	11/18/94	<50	1.0	<0.5	<0.5	<0.5
A-9	09/14/92	<50	<0.5	<0.5	<0.5	<0.5
	11/12/92	<50	<0.5	<0.5	<0.5	<0.5
	02/11/93	<50	<0.5	<0.5	<0.5	<0.5
	04/14/93	<50	<0.5	<0.5	<0.5	<0.5
	08/12/93	<50	<0.5	<0.5	<0.5	<0.5
	10/26/93	<50	<0.5	<0.5	<0.5	<0.5
	02/16/94	<50	<0.5	<0.5	<0.5	<0.5
	05/03/94	---------- Well Not Sampled ----------				
	08/17/94	<50	<0.5	<0.5	<0.5	<0.5
	11/18/94	<50	<0.5	<0.5	<0.5	<0.5
A-10	12/07/92	660	30	<2.5	<2.5	<2.5
	02/11/93	210	<0.5	0.97	<0.5	<0.5
	04/14/93	770	<0.5	3.0	0.76	1.9
	08/12/93	390	<0.5	<0.5	<0.5	0.84
	10/26/93	290	<0.5	<0.5	<0.5	<0.5
	02/16/94	52	<0.5	<0.5	<0.5	<0.5
	05/03/94	<50	<0.5	<0.5	<0.5	<0.5
	08/17/94	<50	<0.5	<0.5	<0.5	<0.5
	11/18/94	<50	<0.5	<0.5	<0.5	<0.5
AR-1	09/14/92	820	67	<1.0	8.8	6.7
	11/12/92	140	66	<0.50	4.3	3.7
	02/11/93	360	190	<2.5	8.6	<2.5
	04/14/93	420	240	5.2	30	8.7
	08/12/93	370	150	<2	11	<2
	10/26/93	240	98	<2	11	<2
	02/17/94	4,700	1,100	<10	140	26
	05/03/94	620	130	1.3	48	4.3
	08/17/94	3,600	630	<5 **	200	12
	11/18/94	12,100	720	6.1	337	15
AR-2	03/30/93	390	4.1	1.6	<0.5	47
	04/14/93	310	18	<0.5	0.67	36
	08/12/93	130	16	<0.5	1.7	0.57
	10/26/93	110	15	<0.5	1.8	<0.5
	02/17/94	130	2.9	<0.5	15	0.8
	05/03/94	<50	<0.5	<0.5	<0.5	<0.5
	08/17/94	3,000	140	<5 **	220	91
	11/18/94	623	10.5	<0.5	27.9	8.0

ppb = Parts per billion
NA = Not analyzed
* = Minimum reporting limit raised due to matrix interference.
** = Minimum reporting limit raised due to high analyte concentration requiring sample dilution.
(D) = Duplicate sample

Table 3
Liquid Surface Elevation Data - Adjacent Facilities

Adjacent Facilities to
ARCO Service Station 5387
20200 Hesperian Boulevard at West Sunset Drive
Hayward, California

Facility Identification	Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Liquid (feet, TOC)	Depth to Water (feet, TOC)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)
Texaco	MW-4A	08/17/94	35.73	11.64	11.64	0.00	24.09
		11/16/94		11.51	11.51	0.00	24.22
	MW-4B	08/17/94	36.62	---------- Well Inaccessible ----------			NA
		11/16/94		12.35	12.35	0.00	24.27
	MW-4C	08/17/94	36.88	---------- Well Inaccessible ----------			NA
		11/16/94		---------- Well Inaccessible ----------			NA
	MW-4D	08/17/94	37.50	13.23	13.23	0.00	24.27
		11/16/94		12.98	12.98	0.00	24.52
	MW-4E	08/17/94	37.39	12.58	12.58	0.00	24.81
		11/16/94		---------- Well Inaccessible ----------			NA
	MW-4F	08/17/94	35.48	11.63	11.65	0.02	23.85
		11/16/94		11.38	11.41	0.03	24.10
	MW-4G	08/17/94	35.19	11.65	11.90	0.25	23.54
		11/16/94		11.41	11.50	0.09	23.78
	MW-4H	08/17/94	36.04	12.27	12.35	0.08	23.77
		11/16/94		12.25	12.28	0.03	23.79
	MW-4I	08/17/94	34.27	10.62	10.62	0.00	23.65
		11/16/94		10.31	10.31	0.00	23.96
	MW-4J	08/17/94	36.74	12.20	12.23	0.03	24.54
		11/16/94		11.91	12.04	0.13	24.83
	MW-4K	08/17/94	36.34	12.02	12.02	0.00	24.32
		11/16/94		11.73	11.73	0.00	24.61
Unocal	MW-1		---------- Well Destroyed ----------				
	MW-2	08/17/94	37.20	12.93	12.93	0.00	24.27
		11/16/94		12.68	12.68	0.00	24.52
	MW-3	08/17/94	37.57	13.10	13.10	0.00	24.47
		11/16/94		12.87	12.87	0.00	24.70
	MW-4	08/17/94	36.82	12.32	12.32	0.00	24.50
		11/16/94		12.14	12.14	0.00	24.68
	MW-5	08/17/94	37.30	12.70	12.70	0.00	24.60
		11/16/94		12.48	12.48	0.00	24.82
	MW-6	08/17/94	38.12	13.58	13.58	0.00	24.54
		11/16/94		13.36	13.36	0.00	24.76
	MW-7	08/17/94	36.70	12.30	12.30	0.00	24.40
		11/16/94		12.06	12.06	0.00	24.64
	MW-8	08/17/94	38.47	13.89	13.89	0.00	24.58
		11/16/94		13.68	13.68	0.00	24.79

Table 3 (continued)
Liquid Surface Elevation Data - Adjacent Facilities

Adjacent Facilities to
ARCO Service Station 5387
20200 Hesperian Boulevard at West Sunset Drive
Hayward, California

Facility Identification	Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Liquid (feet, TOC)	Depth to Water (feet, TOC)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)
Shell	S-1	08/17/94	36.56	11.53	11.53	0.00	25.03
		11/16/94		11.35	11.35	0.00	25.21
Alliance	MW-1	08/17/94	37.13	12.34	12.34	0.00	24.79
		11/16/94		13.30	13.30	0.00	23.83
	MW-2	08/17/94	37.88	13.03	13.03	0.00	24.85
		11/16/94		12.80	12.80	0.00	25.08

SPH = Separate-phase hydrocarbons
MSL = Mean sea level
TOC = Top of casing

Table 4
Groundwater Analytical Data - Adjacent Facilities
Total Petroleum Hydrocarbons
(TPH as Gasoline, BTEX Compounds, and TPH as Diesel)

Adjacent Facilities to
ARCO Service Station 5387
20200 Hesperian Boulevard at West Sunset Drive
Hayward, California

Facility Identification	Well Number	Date Sampled	TPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	TPH as Diesel (ppb)
Texaco	MW-4A	08/17/94	2,000	52	6.4	120	12	NA
		11/16/94	9,400	<5	36	75	91	NA
	MW-4B	08/17/94	Well Inaccessible					
		11/16/94	40,000	3,300	5,100	1,200	6,300	NA
	MW-4C	08/17/94	Well Inaccessible					
		11/16/94	Well Inaccessible					
	MW-4D	08/17/94	540	<0.5	<0.5	2.0	5.3	NA
		11/16/94	500	<0.5	<0.5	1.3	1.9	NA
	MW-4E	08/17/94	28,000	4,600	2,300	850	4,000	NA
		11/16/94	Well Inaccessible					
	MW-4F	08/17/94	0.02 foot of Separate-Phase Hydrocarbons					
		11/16/94	0.03 foot of Separate-Phase Hydrocarbons					
	MW-4G	08/17/94	0.25 foot of Separate-Phase Hydrocarbons					
		11/16/94	0.09 foot of Separate-Phase Hydrocarbons					
	MW-4H	08/17/94	0.08 foot of Separate-Phase Hydrocarbons					
		11/16/94	0.03 foot of Separate-Phase Hydrocarbons					
	MW-4I	08/17/94	1,000	19	19	4.7	13	NA
		11/16/94	1,900	5.7	7.4	5.7	7.1	NA
	MW-4J	08/17/94	0.03 foot of Separate-Phase Hydrocarbons					
		11/16/94	0.13 foot of Separate-Phase Hydrocarbons					
	MW-4K	08/17/94	2,800	2.2	<0.5	2.8	4,000	NA
		11/16/94	1,500	1.3	0.6	1.5	4.7	NA
Unocal	MW-1	08/17/94	Well Destroyed					
	MW-2	08/17/94	ND	ND	ND	ND	ND	61
		11/16/94	76	ND	ND	ND	ND	ND
	MW-3	08/17/94	280	0.60	7.0	ND	1.0	110 *
		11/16/94	91	1.1	0.58	ND	ND	73 *
	MW-4	08/17/94	5,400	22	22	7.3	9.8	1,400 *
		11/16/94	3,300	28	ND	ND	9.5	1,400 *
	MW-5	08/17/94	ND	ND	ND	ND	ND	58 *
		11/16/94	NS	NS	NS	NS	NS	NS
	MW-6	08/17/94	ND	ND	ND	ND	ND	ND
		11/16/94	NS	NS	NS	NS	NS	NS
	MW-7	08/17/94	ND	ND	ND	ND	ND	ND
		11/16/94	NS	NS	NS	NS	NS	NS

Table 4 (continued)
Groundwater Analytical Data - Adjacent Facilities
Total Petroleum Hydrocarbons
(TPH as Gasoline, BTEX Compounds, and TPH as Diesel)

Adjacent Facilities to
ARCO Service Station 5387
20200 Hesperian Boulevard at West Sunset Drive
Hayward, California

Facility Identification	Well Number	Date Sampled	TPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	TPH as Diesel (ppb)
	MW-8	08/17/94	2,100	30	15	<0.5	17	1,000 *
		11/16/94	ND	ND	ND	ND	ND	930 *
Shell	S-1	08/17/94	<500	<0.3	<0.3	<0.3	<0.6	NA
		11/16/94	<50	<0.3	0.3	<0.3	<0.6	NA
Alliance	MW-1	08/17/94	3,200	58	49	4.9	290	980
		11/16/94	1,100	270	43	14	36	270
	MW-2	08/17/94	<50	0.7	<0.5	<0.5	0.6	< 50
		11/16/94	130	11	1.3	0.91	<0.5	<50

ppb = Parts per billion
NA = Not analyzed
ND = Not detected
NS = Not sampled
* = Analytical reports indicate that the sample does not appear to contain diesel. Unidentified hydrocarbon <C_{14} are probably gasoline.

Table 5

Soil Vapor Extraction System Performance Data

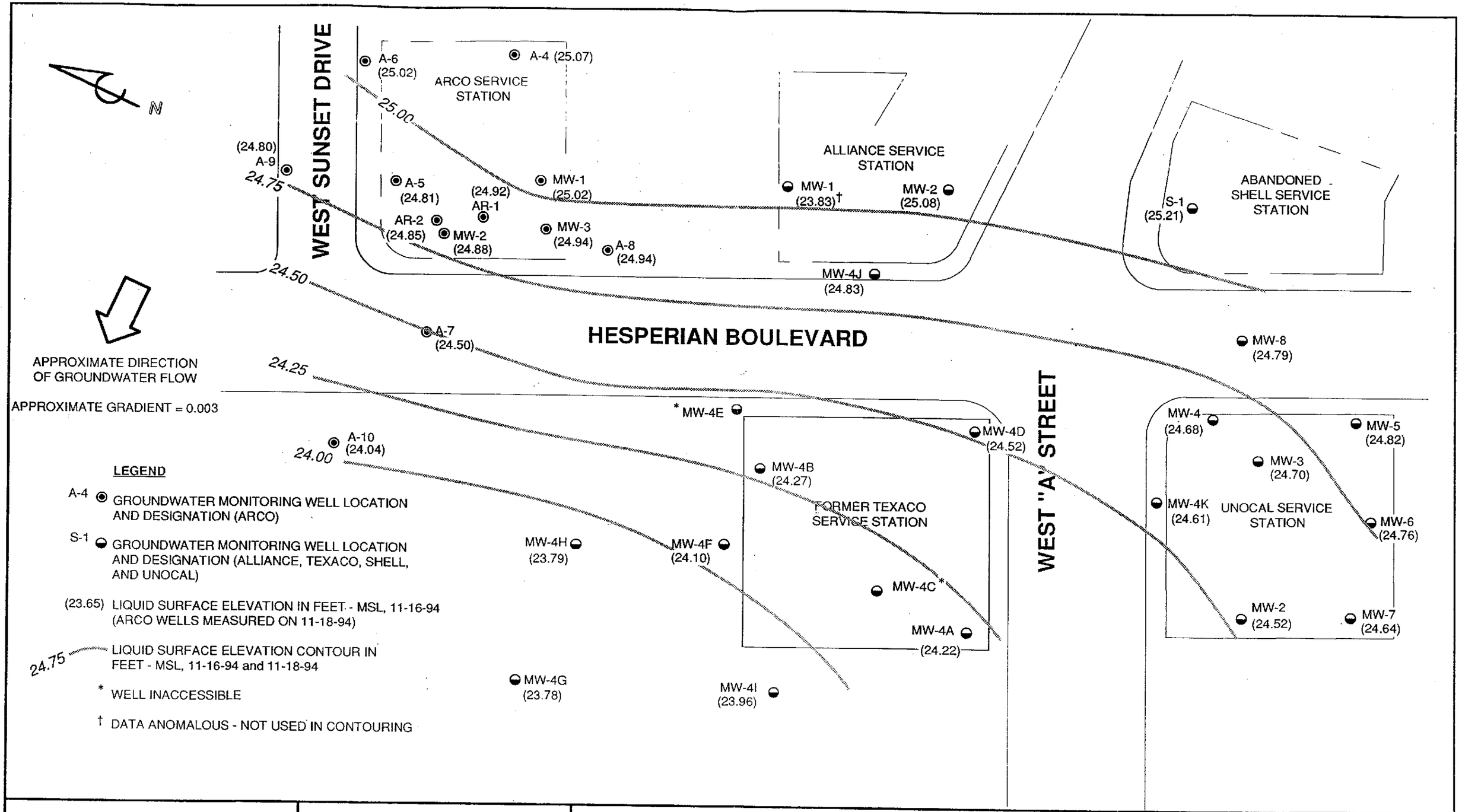
ARCO Service Station 5387
20200 Hesperian Boulevard at West Sunset Drive
Hayward, California

Sample I.D.	Date Sampled	Operational Hours To Date (hours)	Vacuum (" H20)	Flow Rate (scfm)	TPH as Gasoline: Influent Concentration (ppmv)	TPH as Gasoline: Removal Rate (lbs/day)	TPH as Gasoline: Removed to Date (lbs)	Benzene: Influent Concentration (ppmv)	Benzene: Removal Rate (lbs/day)	Benzene: Removed to Date (lbs)
INFL	04/01/93 a	339	N/A	N/A	450 b	4.31	105.6 c	2.7 b	0.023	1.35 c
INFL	11/02/94 d	342	60	280	1,726	183.7	115.4	10.4	0.91	1.40
REPORTING PERIOD: 09/30/94 - 12/31/94										
TOTAL POUNDS REMOVED:							115.4			1.40
TOTAL GALLONS REMOVED:							18.9			0.19
PERIOD POUNDS REMOVED:						9.8			0.05	
PERIOD GALLONS REMOVED:						1.6			0.01	
PERIOD AVERAGE FLOW RATE:				280						

" H20 = Inches of water
TPH = Total petroleum hydrocarbons
scfm = Standard cubic feet per minute
ppmv = Parts per million by volume; converted from micrograms per liter
lbs = Pounds
N/A = Not available

a. Data prior to October 1, 1994 taken from material provided by prior consultant.
b. Samples taken March 28, 1994 as reported by prior consultant.
c. Estimated cumulative pounds removed since startup, as reported by prior consultant.
d. System startup performed by Pacific Environmental Group, Inc. (new consultant). System shut down after 2.5 hours.

Density of Gasoline assumed to be 6.1 pounds/gallon; density of benzene assumed to be 7.34 pounds/gallon.
See certified analytical reports for detection limits.



PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE
0 60 120 FEET

ARCO SERVICE STATION 5387
20200 Hesperian Boulevard at West Sunset Drive
Hayward, California

LIQUID SURFACE ELEVATION CONTOUR MAP

FIGURE
1
PROJECT:
330-110.2A

N

WEST SUNSET DRIVE

A-6 ND/ND

A-4 98/1.3

ARCO SERVICE STATION

6,350/112

A-5 338/0.6

MW-1

AR-1 12,100/720

AR-2 623/10.5

MW-2 14,900/640

MW-3 909/1.1

A-8 ND/1.0

A-9 ND/ND

ALLIANCE SERVICE STATION

MW-1 1,100/270

MW-2 130/11

MW-4J 0.13 SPH

ABANDONED SHELL SERVICE STATION

S-1 ND/ND

A-7 412/1.3

HESPERIAN BOULEVARD

MW-8 ND/ND

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

WEST "A" STREET

* MW-4E

MW-4D 500/ND

MW-4B 40,000/3,300

FORMER TEXACO SERVICE STATION

MW-4C*

MW-4A 9,400/ND

MW-4 3,300/28

MW-5 NS

MW-3 91/1.1

MW-4K 1,500/1.3

UNOCAL SERVICE STATION

MW-6 NS

MW-2 76/ND

MW-7 NS

A-10 ND/ND

MW-4H 0.03 SPH

MW-4F 0.03 SPH

MW-4G 0.09 SPH

MW-4I 1,900/5.7

LEGEND

A-4 ◉ GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION (ARCO)

S-1 ◒ GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION (ALLIANCE, TEXACO, SHELL, AND UNOCAL)

412./1.3 TPH-g/BENZENE CONCENTRATION IN GROUNDWATER, IN PARTS PER BILLION, 11-16-94 (ARCO WELLS SAMPLED 11-18-94)

0.03 SPH SEPARATE-PHASE HYDROCARBONS THICKNESS IN FEET, 11-16-94

ND NOT DETECTED

NS NOT SAMPLED

* WELL INACCESSIBLE

PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE

0 60 120 FEET

ARCO SERVICE STATION 5387
20200 Hesperian Boulevard at West Sunset Drive
Hayward, California

TPH-g/BENZENE CONCENTRATION MAP

FIGURE 2

PROJECT: 330-110.2A

Figure 3
Soil Vapor Extraction System Mass Removal Data

ARCO Service Station 5387
20200 Hesperian Boulevard at West Sunset Drive
Hayward, California

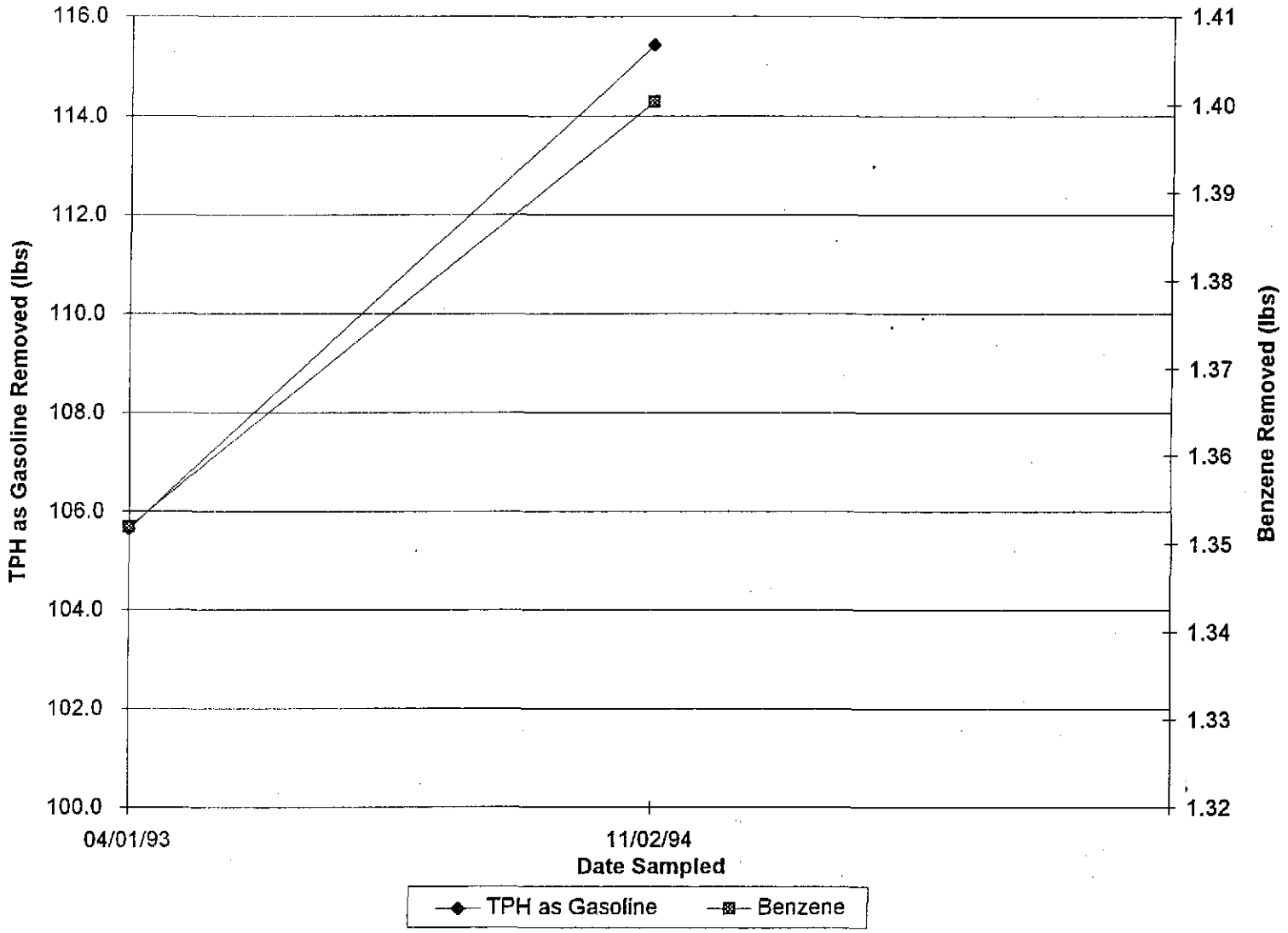
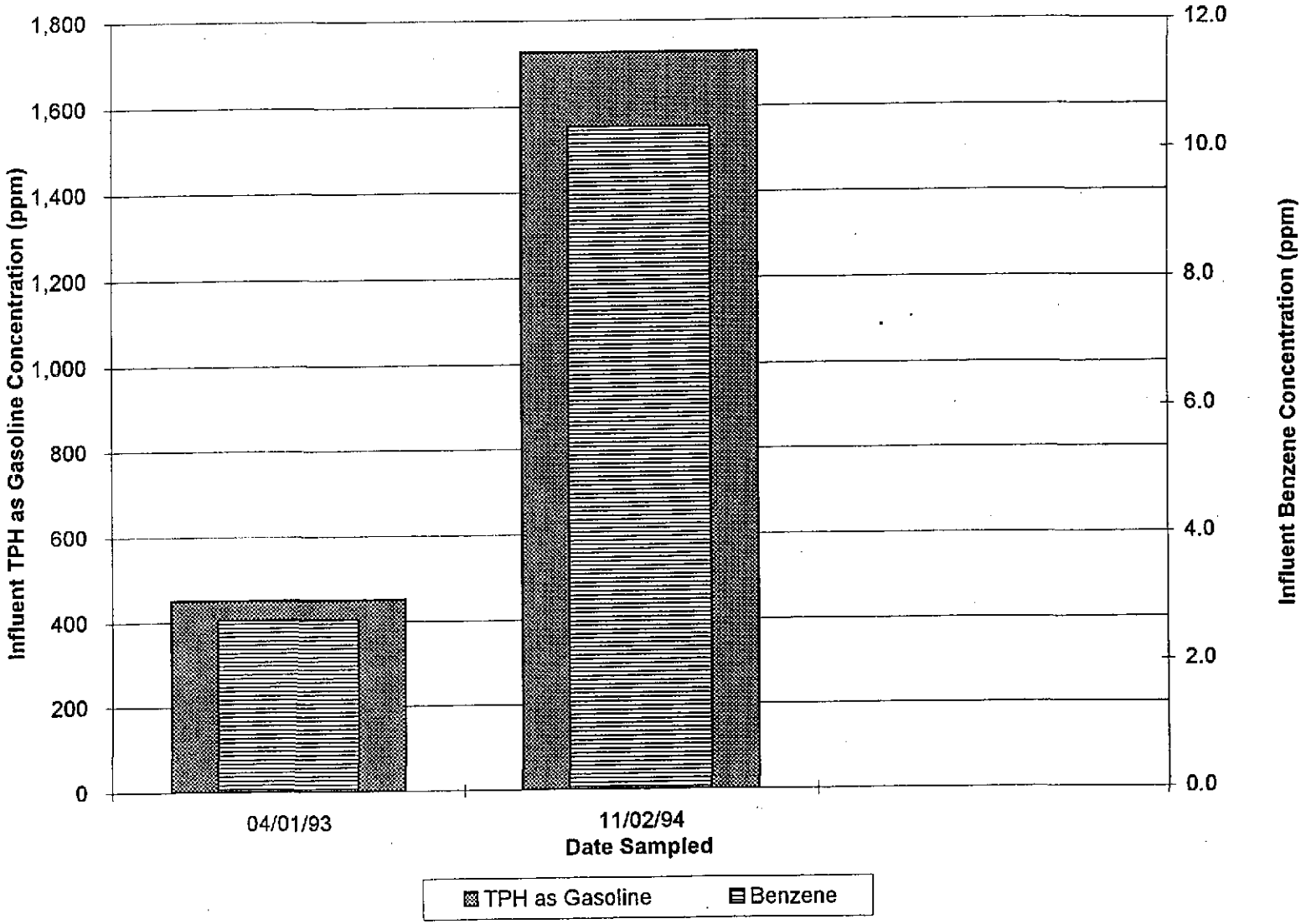


Figure 4
Soil Vapor Extraction System Hydrocarbon Concentrations

ARCO Service Station 5387
20200 Hesperian Boulevard at West Sunset Drive
Hayward, California



ATTACHMENT A

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

330-110.24

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

December 23, 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. 5387 in San Lorenzo, California. Integrated Wastestream Management measured the depth to water and collected samples from wells at this site on November 18, 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
4/'96
STATE OF CALIFORNIA

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

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

A5387Q4.XLS

Summary of Ground Water Sample Analyses for ARCO Facility A-5387, San Lorenzo, California

WELL NUMBER	AR-1	AR-2	MW-1	MW-2	MW-3	A-4	A-5	A-6	A-7	A-8	A-9	A-10	X-DUP
DATE SAMPLED	11/18/94	11/18/94	11/18/94	11/18/94	11/18/94	11/18/94	11/18/94	11/18/94	11/18/94	11/18/94	11/18/94	11/18/94	11/18/94
DEPTH TO WATER	12.41	13.33	12.31	13.18	11.93	14.46	13.73	13.76	14.95	11.90	13.44	14.68	NA
SHEEN	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NONE	NA
PRODUCT THICKNESS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TPHg	12,100	623	6,350	14,900	909	98	338	ND	412	ND	ND	ND	14,500
BTEX													
BENZENE	720#	10.5	112	640#	1.1	1.3	0.6	ND	1.3	1.0	ND	ND	680#
TOLUENE	6.1	ND	8.4	3.4	ND	0.6	ND	ND	ND	ND	ND	ND	6.1
ETHLYBENZENE	337	27.9	107	532	0.9	ND	4.6	ND	6.2	ND	ND	ND	528
XYLENES	15	8.0	35	156	4.0	ND	ND	ND	2.0	ND	ND	ND	155

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: 1030

Site Departure Time: 1900

Weather Conditions: WINDY COLD SUNNY

DTW: Well Box or Well Casing (circle one)

Project No.: _____ **Location:** 20200 HESPERIAN BLVD **Date:** 11-19-99

Client / Station#: ARCO 5387 **Field Technician:** THOMMY / CISCO **Day of Week:** FRIDAY

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
10	AR-1	OK	YES	OK	MISSING	OK	34.78	12.41	12.41	N/A	N/A	N	6"	
9	AR-2	OK	YES	OK	OK	OK	35.50	13.33	13.33	N/A	N/A	N	6"	2X2
11	MW-1	OK	YES	OK	OK	OK	28.80	12.31	12.31	N/A	N/A	N	2" BOX SUBMERGED IN H2O	2X2
12	MW-2	OK	YES	MISSING	OK	OK	27.09	13.18	13.18	N/A	N/A	N	2" H2O ON WELL BOX	
8	MW-3	OK	YES	OK	OK	OK	28.39	11.93	11.93	N/A	N/A	N	2"	2X2
5	A-4	OK	YES	OK	OK	OK	35.00	14.46	14.46	N/A	N/A	N	3"	15/16
6	A-5	OK	YES	OK	OK	OK	30.08	13.73	13.73	N/A	N/A	N	3" WELL BOX SUBMERGED IN H2O	15/16
1	A-6	OK	YES	OK	OK	OK	34.94	13.76	13.76	N/A	N/A	N	3" H2O IN WELL BOX	15/16
7	A-7	OK	YES	OK	OK	OK	35.60	14.95+	14.95+	N/A	N/A	N	3"	CHRISTY
4	A-8	OK	YES	MISSING	OK	OK	34.14	11.90	11.90	N/A	N/A	N	3" WELLBOX SUBMERGED IN H2O	CHRISTY
2	A-9	OK	YES	MISSING	OK	OK	34.10	13.44+	13.44+	N/A	N/A	N	2" WELL BOX SUBMERGED IN H2O	CHRISTY
3	A-10	OK	YES	OK	OK	OK	34.36	14.68+	14.68+	N/A	N/A	N	2" H2O IN WELLBOX	15/16

AGE 2 OF 4 DATE: 11-18-94 CLIENT/STATION #: Arco 5387 ADDRESS: 20200 HESPERIAN BLVD

WELL ID: A-6 | 34.94 TD | 13.76 DTW | 0.38 Gal./Linear Ft. | X 3 Casing Volume | = 24.14 Calculated Purge

DATE PURGED: 11-18-94 START (2400 HR): 1332 END (2400 HR) 1338
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1343 DTW: 13.78

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1333	5.0	6.72	1.14	65.4	CLEAR
1335	12.0	6.69	1.10	64.1	CLEAR
1337	19.0	6.68	1.08	63.9	CLEAR
1338	25.0	6.68	1.07	63.2	CLEAR

Total purge: 25
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-9 | 34.10 TD | 13.44' DTW | 0.17 Gal./Linear Ft. | X 3 Casing Volume | = 10.53 Calculated Purge

DATE PURGED: 11-18-94 START (2400 HR): 1350 END (2400 HR) 1353
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1357 DTW: 13.50

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1350	2.0	6.69	1.16	68.2	CLEAR
1351	5.0	6.67	0.99	67.7	CLEAR
1353	10.5	6.65	1.03	67.2	CLEAR

Total purge: 10.5
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-10 | 34.30 TD | 14.68 DTW | 0.17 Gal./Linear Ft. | X 3 Casing Volume | = 10.03 Calculated Purge

DATE PURGED: 11-18-94 START (2400 HR): 1412 END (2400 HR) 1415
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1418 DTW: 14.8

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1412	1.0	6.62	1.16	67.6	CLEAR
1414	5.0	6.59	1.21	67.4	CLEAR
1415	10.0	6.60	1.18	67.1	CLEAR

Total purge: 10.0
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-8 | 34.14 TD | 11.90 DTW | 0.17 Gal./Linear Ft. | X 3 Casing Volume | = 11.34 Calculated Purge

DATE PURGED: 11-18-94 START (2400 HR): 1435 END (2400 HR) 1439
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1440 DTW: 12.0

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1435	1.0	6.73	1.13	66.1	CLEAR
1436	4.0	6.68	1.14	65.7	CLEAR
1437	8.0	6.68	1.11	65.1	CLEAR
1438	12.0	6.79	1.13	64.7	CLEAR

Total purge: 12.0
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

PRINT NAME: THOMMY PETES/ SIGNATURE:

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 4 DATE: 11-18-94 CLIENT/STATION #: Arco 5387 ADDRESS: 20200 HESPERIAN BLVD.

WELL ID: A-4 | 35.02 TD - 14.46 DTW x 0.38 Gal./Linear Ft. x 3 Casing Volume = 23.41 Calculated Purge

DATE PURGED: 11-18-94 START (2400 HR): 1456 END (2400 HR) 1502
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1505 DTW: 14.47

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1457	5.0	6.73	1.00	63.4	CLEAR
1459	11.0	6.68	1.03	63.1	CLEAR
1501	17.0	6.92	1.06	62.5	CLEAR
1502	23.0	6.75	1.06	61.8	CLEAR

Total purge: 23.0
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-5 | 30.08 TD - 13.73 DTW x 0.38 Gal./Linear Ft. x 3 Casing Volume = 18.63 Calculated Purge

DATE PURGED: 11-18-94 START (2400 HR): 1518 END (2400 HR) 1525
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1528 DTW: 13.84

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1521	6.0	6.62	1.05	65.3	CLEAR
1523	12.0	6.63	1.12	64.8	CLEAR
1525	19.0	6.64	1.13	64.1	CLEAR

Total purge: 19.0
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-7 | 35.60 TD - 19.95 DTW x 0.38 Gal./Linear Ft. x 3 Casing Volume = 23.54 Calculated Purge

DATE PURGED: 11-18-94 START (2400 HR): 1542 END (2400 HR) 1548
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1552 DTW: 17.2

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1542	2.0	6.83	1.07	63.5	CLEAR
1544	8.0	6.94	1.10	62.9	CLEAR
1546	16.0	6.97	1.05	62.3	CLEAR
1548	24.0	6.89	1.03	61.8	CLEAR

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

WELL ID: MW-3 | 28.39 TD - 11.93 DTW x 0.17 Gal./Linear Ft. x 3 Casing Volume = 8.39 Calculated Purge

DATE PURGED: 11-18-94 START (2400 HR): 1612 END (2400 HR) 1614
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1618 DTW: 12.1

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1612	1.0	6.51	1.03	65.1	CLOUDY
1613	3.0	6.64	1.04	64.3	CLOUDY
1615	5.0	6.69	1.06	64.2	CLOUDY
1614	8.0	6.70	1.04	63.8	CLOUDY

Total purge: 8.0
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

PRINT NAME: THOMMY PETES SIGNATURE:

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 4 DATE: 11-18-94 CLIENT/STATION #: ARCO 5387 ADDRESS: 20200 HESPERIAN BLVD

WELL ID: AR-2 TD 35.50 − DTW 13.33 × 1.5 Gal./Linear Ft. × 2 Casing Volume = 66.51 Calculated Purge

DATE PURGED: 11-18-94 START (2400 HR): 0715 END (2400 HR) 1740
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1743 DTW: 26.0

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
0719	15.0	6.88	0.91	67.7	CLEAR
0725	34.0	7.14	0.73	67.1	CLEAR
0731	48.0	7.15	0.73	66.7	CLEAR
0740	67	7.14	0.71	66.0	CLEAR

Total purge: 67

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

REMARKS:

WELL ID: AR-1 TD 34.78 − DTW 12.41 × 1.5 Gal./Linear Ft. × 2 Casing Volume = 67.11 Calculated Purge

DATE PURGED: 11-18-94 START (2400 HR): 1633 END (2400 HR) 1654
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1700 DTW: 16.3

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1636	15.0	7.29	1.18	62.4	CLEAR
1643	34.0	6.99	.95	64.0	CLEAR
1648	48.0	7.01	.95	63.7	CLEAR
1654	68.0	7.18	.89	63.3	CLEAR

Total purge: 68.0

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

REMARKS:

WELL ID: MW-1 TD 28.80 − DTW 12.31 × 0.17 Gal./Linear Ft. × 3 Casing Volume = 8.40 Calculated Purge

DATE PURGED: 11-18-94 START (2400 HR): 1751 END (2400 HR) 1754
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1757 DTW: 12.4

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1752	2.0	6.95	.63	64.4	CLOUDY
1753	5.0	7.04	.64	63.7	CLOUDY
1754	8.0	7.08	.65	63.2	CLOUDY

Total purge: 8.0

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

REMARKS:

WELL ID: MW-2 TD 27.09 − DTW 13.18 × 0.17 Gal./Linear Ft. × 3 Casing Volume = 7.09 Calculated Purge

DATE PURGED: 11-18-94 START (2400 HR): 1802 END (2400 HR) 1804
DATE SAMPLED: 11-18-94 TIME (2400 HR): 1810 DTW: 13.28

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1802	1.0	6.98	.65	66.1	CLOUDY
1803	4.0	7.01	.70	65.6	CLOUDY
1804	7.0	7.03	.73	64.9	CLOUDY

Total purge: 7.0

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

REMARKS:

PRINT NAME: THOMAS REYES / CISCO ENVIRON SIGNATURE:

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.

RECEIVED DEC 2 3 1994

December 22, 1994

Service Request No.: K947394S

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

RECEIVED DEC 2 8 1994

Re: **ARCO San Lorenzo/Project #SJ94-1508**

Dear Ms. Austin/Mr. DeLon:

Enclosed are the results of the sample(s) submitted to our laboratory on November 28, 1994. For your reference, these analyses have been assigned our service request number K947394S.

All analyses were performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (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. My extension is 239.

Respectfully submitted,

Columbia Analytical Services, Inc.

Howard Boorse
Project Chemist

HB/rr

1317 South 13th Avenue • P.O. Box 479 • Kelso, Washington 98626 • Telephone 206/577-7222 • Fax 206/636-1068

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
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
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
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NAN	Not Analyzed
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected at or above the MRL
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons

00002

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	IWM	**Service Request:**	K947394S
Project:	ARCO San Lorenzo/#5387	**Date Collected:**	11/18/94
Sample Matrix:	Water	**Date Received:**	11/28/94
		Date Extracted:	NA
		Date Analyzed:	11/29,30/94

BTEX and Total Petroleum Hydrocarbons as Gasoline
EPA Methods 5030/8020 and California DHS LUFT Method
Units: µg/L (ppb)

Analyte:	Benzene	Toluene	Ethylbenzene	Total Xylenes	TPH as Gasoline
Method Reporting Limit:	0.5	0.5	0.5	1	50
Sample Name	**Lab Code**				
MW-1	K947394-001	112	8.4	107	35	6350
MW-2	K947394-002	640(a)	3.4	532	156	14900
MW-3	K947394-003	1.1	ND	0.9	4	909
AR-1	K947394-004	720(a)	6.1	337	15	12100
AR-2	K947394-005	10.5	ND	27.9	8	623
A-4	K947394-006	1.3	0.6	ND	ND	98
A-5	K947394-007	0.6	ND	4.6	ND	338
A-6	K947394-008	ND	ND	ND	ND	ND
A-7	K947394-009	1.3	ND	6.2	2	412
A-8	K947394-010	1.0	ND	ND	ND	ND
A-9	K947394-011	ND	ND	ND	ND	ND
A-10	K947394-012	ND	ND	ND	ND	ND
X-DUP	K947394-013	680(a)	6.1	528	155	14500
Method Blank	K941129-WB	ND	ND	ND	ND	ND

a Result is from the analysis of a diluted sample. Dilution factor: 1:10.

Approved By: _____ Date: 12/22/94

00003

5A/102194
K947394S.XLS - BTXw 12/22/94

APPENDIX A

LABORATORY QC RESULTS

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO San Lorenzo/#5387
Sample Matrix: Water

Service Request: K947394S
Date Collected: 11/18/94
Date Received: 11/28/94
Date Extracted: NA
Date Analyzed: 11/29,30/94

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

Sample Name	Lab Code	Percent Recovery 4-BFB (PID - BTEX)	Percent Recovery 4-BFB (FID - GAS)
MW-1	K947394-001	85	114
MW-2	K947394-002	83	118
MW-3	K947394-003	93	113
AR-1	K947394-004	94	107
AR-2	K947394-005	94	100
A-4	K947394-006	91	97
A-5	K947394-007	93	102
A-6	K947394-008	91	94
A-7	K947394-009	92	100
A-8	K947394-010	91	94
A-9	K947394-011	91	94
A-10	K947394-012	90	95
X-DUP	K947394-013	82	103
MW-2	K947394-002D	82	118
Batch QC	K947395-003MS	94	-
A-4	K947394-006MS	-	99
Laboratory Control Sample	K941129-WL	97	101
Method Blank	K941129-WB	91	97
CAS Acceptance Limits:		70-122	51-143

Approved By: _____ Date: 12/22/94

00005

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO San Lorenzo/#5387
Sample Matrix: Water

Service Request: K947394S
Date Collected: 11/18/94
Date Received: 11/28/94
Date Extracted: NA
Date Analyzed: 11/29/94

Duplicate Summary
BTEX and Total Petroleum Hydrocarbons as Gasoline
EPA Methods 5030/8020 and California DHS LUFT Method
Units: µg/L (ppb)

Sample Name: MW-2
Lab Code: K947394-002

Analyte	MRL	Sample Result	Duplicate Sample Result	Average	Relative Percent Difference	CAS RPD Acceptance Limit
Benzene	0.5	640	650	640	2	30
Toluene	0.5	4.0	3.4	3.7	16	30
Ethylbenzene	0.5	532	541	536	2	30
Total Xylenes	0.1	156	158	157	1	30
Gasoline	50	14900	15200	15000	2	30

Approved By: Howard Foust Date: 12/22/94

00006

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO San Lorenzo/#5387
Sample Matrix: Water

Service Request: K947394S
Date Collected: 11/18/94
Date Received: 11/28/94
Date Extracted: NA
Date Analyzed: 11/30/94

Matrix Spike Summary
BTEX and Total Petroleum Hydrocarbons as Gasoline
EPA Methods 5030/8020 and California DHS LUFT Method
Units: µg/L (ppb)

Sample Name: Batch QC
Lab Code: K947395-003

Analyte	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	0.5	100	3.5	87.7	84	56-129
Toluene	0.5	100	ND	81.0	81	61-126
Ethylbenzene	0.5	100	1.2	76.6	75	54-132

Approved By: Howard Bowe Date: 12/22/94

00007

MS1S/102194
K947394S.XLS - BTXwMS 12/22/94

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO San Lorenzo/#5387
Sample Matrix: Water

Service Request: K947394S
Date Collected: 11/18/94
Date Received: 2/1/03
Date Extracted: NA
Date Analyzed: 11/30/94

Matrix Spike Summary
BTEX and Total Petroleum Hydrocarbons as Gasoline
EPA Methods 5030/8020 and California DHS LUFT Method
Units: µg/L (ppb)

Sample Name: A-4
Lab Code: K947394-006

Analyte	MRL	Spike Level	Sample Result	Spiked Sample Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Gasoline	50	2500	98	2670	103	52-133

Approved By: _____ Date: 12/22/94

00003

MS1S/102194
K947394S.XLS - BTXwMS (2) 12/22/94

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: IWM
Project: ARCO San Lorenzo/#5387
LCS Matrix: Water

Service Request: K947394S
Date Collected: NA
Date Received: NA
Date Extracted: NA
Date Analyzed: 11/30/94

Laboratory Control Sample Summary
BTEX and Total Petroleum Hydrocarbons as Gasoline
EPA Methods 5030/8020 and California DHS LUFT Method
Units: µg/L (ppb)

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	100	85.1	85	70-120
Toluene	100	84.9	85	73-120
Ethylbenzene	100	82.0	82	72-125
Gasoline	2500	2610	104	74-141

Approved By: _____ Date: 12/22/94 00009

LCS/102194

K947394S.XLS - BTXwLCS 12/22/94

APPENDIX B

CHAIN OF CUSTODY INFORMATION

K941394S

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. IWM-94-5CC

Chain of Custody

ARCO Facility no. A5387	City (Facility) San Lorenzo	Project manager (Consultant) Tom De Son	Laboratory name Columbia
ARCO engineer MW	Telephone no. (ARCO) 415 572 2434	Telephone no. (Consultant) 408/942 1499	Fax no. (Consultant) 408/942 3955
Consultant name IWM-94-5CC	Address (Consultant) 950 Amer av. Mtn. CA 95035		Contract number 07077

Method of shipment: sample delivered

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	TRH 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 ☐	
FB1	13	2		✓		✓	✓	11-18-94	1045		✓	✓									
MW1	1	2		✓		✓	✓		1757		✓	✓									
MW2	2	2		✓		✓	✓		1810		✓	✓									
MW3	3	2		✓		✓	✓		1618		✓	✓									
AR-1	4	2		✓		✓	✓		1700		✓	✓									
AR-2	5	2		✓		✓	✓		1743		✓	✓									
A-4	6	2		✓		✓	✓		1505		✓	✓									
A-5	7	2		✓		✓	✓		1528		✓	✓									
A-6	8	2		✓		✓	✓		1343		✓	✓									
A-7	9	2		✓		✓	✓		1552		✓	✓									
A-8	10	2		✓		✓	✓		1440		✓	✓									
A-9	11	2		✓		✓	✓		1357		✓	✓									
A-10	12	2		✓		✓	✓		1418		✓	✓									

Special detection Limit/reporting:

Special QA/QC: 1 VOA Broken in route to lab MW3

Remarks: Add on FB-1 Received set of VOAs not on COC labelled as Dup

Lab number: S941508

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

Condition of sample: Okay

Temperature received: Okay Cool

Relinquished by sampler	Date 11/22/94	Time 1630	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory

Received by: 11/22/94 SJCAS 1630

Received by: CAS 11/28/94 0915

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

all to Kelso

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

GROUNDWATER ANALYTICAL RESULTS FROM ADJACENT SITES

Table 1
Groundwater Elevation Data
20499 Hesperian Boulevard, Hayward, CA

Well	Date	Top of Casing Elevation	Depth to Water	Elevation of Groundwater	Floating Product Thickness
MW-4A	10/12/88	35.72			
	1/29/92		13.55	22.27	----
	2/28/92		11.58	24.24	----
	3/26/92		11.02	24.80	----
	4/21/92		11.33	24.99	----
	5/28/92		12.00	23.82	----
	6/28/92		12.46	23.36	----
	9/24/92		13.37	22.45	None
	10/8/92		13.52	22.30	None
	11/3/92		13.38	22.44	None
	12/4/92		13.43	22.39	None
	1/26/93		10.20	25.26	None
	2/25/93		9.55	26.27	None
	3/4/93		9.50	26.32	None
	4/30/93		10.09	25.73	None
	5/27/93		10.46	25.36	None
	6/23/93		10.90	24.92	None
	7/26/93	Inaccessible - Debris Covering Well			
	8/19/93	Inaccessible - Debris Covering Well			
	9/14/93	Inaccessible - Debris Covering Well			
	10/19/93			Not Monitored	
	3/29/94		10.57	25.15	None
Resurveyed	8/3/94	35.73			
	8/17/94		11.64	24.09	None
	11/16/94		11.51	24.22	None
MW-4B	11/16/94	36.62	12.35	24.27	None

Table 1
Groundwater Elevation Data
20499 Hesperian Boulevard, Hayward, CA

Well	Date	Top of Casing Elevation	Depth to Water	Elevation of Groundwater	Floating Product Thickness
MW-4C	10/12/88	36.88			
	1/29/92		14.53	22.34	----
	2/28/92		12.55	24.33	----
	3/26/92		11.99	24.89	----
	4/21/92		12.30	24.58	----
	5/28/92		12.05	24.83	----
	6/28/92		13.42	23.46	----
	9/24/92		14.38	22.50	----
	10/8/92	Not Accessible - Covered With Soil			
	11/3/92	Not Accessible - Covered With Soil			
	12/4/92	Not Accessible - Covered With Soil			
	1/26/93	Not Accessible - Covered With Soil			
	2/25/93			Not Monitored	
	3/4/93			Not Monitored	
	4/30/93		11.07	25.81	None
	5/27/93		11.38	25.50	None
	6/23/93		Not Accessible - Lid Stuck		
	7/26/93		12.08	24.80	None
	8/19/93		12.49	24.39	None
	9/14/93		12.95	23.93	None
	10/19/93			Not Monitored	
	3/29/94	Not Accessible - Covered With Soil			
Resurveyed	8/3/94	36.88			
	8/17/94	Not Accessible - Covered With Soil			
	11/16/94	Not Accessible - Covered With Soil			

Table 1
Groundwater Elevation Data
20499 Hesperian Boulevard, Hayward, CA

Well	Date	Top of Casing Elevation	Depth to Water	Elevation of Groundwater	Floating Product Thickness
MW-4D	10/12/88	37.50			
	1/29/92		14.92	22.58	----
	2/28/92		12.89	24.61	----
	3/26/92		12.32	25.18	----
	4/21/92		12.63	24.87	----
	5/28/92		13.35	24.15	----
	6/28/92		13.74	23.76	----
	9/24/92		14.70	22.80	None
	10/8/92		14.80	22.70	None
	11/3/92		14.66	22.84	None
	12/4/92		14.75	22.75	None
	1/26/93		11.03	26.47	None
	2/25/93		10.75	26.75	None
	3/4/93		10.80	26.70	None
	4/30/93		11.30	26.20	None
	5/27/93		11.67	25.83	None
	6/23/93		11.95	25.55	None
	7/26/93		12.39	25.11	None
	8/19/93		12.80	24.70	None
	9/14/93		13.15	24.35	None
	10/19/93			Not Monitored	
	3/29/94		12.00	25.50	None
Resurveyed	8/3/94	37.50			
	8/17/94		13.23	24.27	None
	11/16/94		12.98	24.52	None

Table 1
Groundwater Elevation Data
20499 Hesperian Boulevard, Hayward, CA

Well	Date	Top of Casing Elevation	Depth to Water	Elevation of Groundwater	Floating Product Thickness
MW-4E	10/12/88	36.60			
	1/29/92		14.24	22.36	----
	2/28/92		12.20	24.40	----
	3/26/92		11.67	24.93	----
	4/21/92		11.96	24.64	----
	5/28/92		12.60	24.00	----
	6/28/92		13.13	23.47	----
	9/24/92		14.10	22.50	None
	10/8/92		14.18	22.42	Sheen
	11/3/92		14.02	22.58	Sheen
	12/4/92		14.08	22.52	Sheen
	1/26/93		10.38	26.22	None
	2/25/93		10.13	26.27	None
	3/4/93		10.17	26.43	Sheen
	4/30/93		10.65	25.95	None
	5/27/93		11.00	25.60	None
	6/23/93		9.32	27.28	None
	7/26/93		11.78	24.82	None
	8/19/93		12.19	24.41	None
	9/14/93		12.43	24.17	Sheen
	10/19/93			Not Monitored	
	3/29/94		11.34	25.26	None
Resurveyed	8/3/94	37.39			
	8/17/94		12.58	24.81	None
	11/16/94			Not Accessible	

Table 1
Groundwater Elevation Data
20499 Hesperian Boulevard, Hayward, CA

Well	Date	Top of Casing Elevation	Depth to Water	Elevation of Groundwater	Floating Product Thickness
MW-4F	8/31/89	35.47			
	1/29/92		13.45	22.02	0.28
	2/28/92		11.32	24.15	0.11
	3/26/92		10.77	24.70	0.14
	4/21/92		11.19	24.28	0.30
	5/28/92		11.85	23.62	0.30
	6/28/92		12.41	23.06	0.33
	9/24/92			Not Accessible	
	10/8/92		13.42	22.05	0.02
	11/3/92		13.28	22.19	0.02
	12/4/92		13.10	22.37	0.03
	1/26/93		8.40	27.07	0.16
	2/25/93		9.14	26.33	0.04
	3/4/93		9.19	26.27	0.02
	4/30/93		9.68	25.80	0.01
	5/27/93		10.12	25.38	0.04
	6/23/93		10.60	24.98	0.14
	7/26/93		10.96	24.59	0.10
	8/19/93		11.37	24.18	0.10
	9/14/93		11.57	23.88	0.09
	10/19/93		11.85	23.64	0.03
	3/29/94		10.40	25.09	0.02
Resurveyed	8/3/94	35.48			
	8/17/94		11.65	23.85	0.02
	11/16/94		11.41	24.09	0.03

Table 1
Groundwater Elevation Data
20499 Hesperian Boulevard, Hayward, CA

Well	Date	Top of Casing Elevation	Depth to Water	Elevation of Groundwater	Floating Product Thickness
MW-4G	8/31/89	35.18			
	1/29/92		13.39	21.79	0.31
	2/28/92		11.28	23.90	0.10
	3/26/92		10.68	24.50	0.06
	4/21/92		11.03	24.15	0.15
	5/28/92		11.75	23.43	0.15
	6/28/92		12.28	22.90	0.20
	9/24/92			Not Measured	
	10/8/92		13.09	22.09	0.45
	11/3/92		12.96	22.22	0.45
	12/4/92		13.15	22.03	0.45
	1/26/93		9.43	25.75	0.02
	2/25/93		9.21	25.97	Sheen
	3/4/93		9.27	25.91	Sheen
	4/30/93		9.72	25.46	Sheen
	5/27/93		10.13	25.05	Sheen
	6/23/93		10.60	24.61	0.04
	7/26/93		11.01	24.20	0.04
	8/19/93		11.42	23.79	0.04
	9/14/93		11.72	23.52	0.07
	10/19/93		11.87	23.32	0.01
	3/29/94		10.60	24.63	0.06
Resurveyed	8/3/94	35.19			
	8/17/94		11.90	23.49	0.25
	11/16/94		11.50	23.76	0.09

Table 1
Groundwater Elevation Data
20499 Hesperian Boulevard, Hayward, CA

Well	Date	Top of Casing Elevation	Depth to Water	Elevation of Groundwater	Floating Product Thickness
MW-4H	8/31/89	36.01			
	1/29/92		14.10	21.91	0.33
	2/28/92		11.99	24.04	0.15
	3/26/92		11.40	24.61	0.13
	4/21/92		11.76	24.25	0.24
	5/28/92		12.47	23.54	0.27
	6/28/92		12.99	23.02	0.27
	9/24/92			Not Measured	
	10/8/92		13.96	22.05	0.30
	11/3/92		13.81	22.20	0.30
	12/4/92		13.75	22.26	0.23
	1/26/93		10.05	25.96	0.03
	2/25/93		9.92	26.09	Sheen
	3/4/93		9.85	26.16	Sheen
	4/30/93		10.38	25.71	0.10
	5/27/93		10.74	25.29	0.02
	6/23/93		11.25	24.89	0.16
	7/26/93		11.57	24.56	0.15
	8/19/93		11.98	24.15	0.15
	9/14/93		12.36	23.76	0.14
	10/19/93		12.56	23.53	0.10
	3/29/94		11.03	25.22	0.30
Resurveyed	8/3/94	36.04			
	8/17/94		12.35	23.75	0.08
	11/16/94		12.28	23.78	0.03

Table 1
Groundwater Elevation Data
20499 Hesperian Boulevard, Hayward, CA

Well	Date	Top of Casing Elevation	Depth to Water	Elevation of Groundwater	Floating Product Thickness
MW-4I	12/6/89	34.28			
	1/29/92		12.07	22.21	----
	2/28/92		10.01	24.27	----
	3/26/92		9.53	24.75	----
	4/21/92		9.84	24.44	----
	5/28/92		10.50	23.78	----
	6/28/92		10.99	23.29	----
	9/24/92			Not Accessible	
	10/8/92		11.93	22.35	None
	11/3/92		11.80	22.48	None
	12/4/92		11.92	22.36	None
	1/26/93		8.35	25.93	None
	2/25/93		8.10	26.18	None
	3/4/93		10.07	24.21	None
	4/30/93		8.65	25.63	None
	5/27/93		8.87	25.41	None
	6/23/93		9.30	24.98	None
	7/26/93		9.74	24.54	None
	8/19/93		10.15	24.13	None
	9/14/93		10.05	23.78	None
	10/19/93		10.61	23.67	None
	3/29/94		9.33	24.95	None
Resurveyed	8/3/94	34.27			
	8/17/94		10.62	23.65	None
	11/16/94		10.31	23.96	None

Table 1
Groundwater Elevation Data
20499 Hesperian Boulevard, Hayward, CA

Well	Date	Top of Casing Elevation	Depth to Water	Elevation of Groundwater	Floating Product Thickness
MW-4J	3/23/90	36.74			
	1/29/92		14.60	22.14	0.82
	2/28/92		11.87	24.87	NM
	3/26/92		11.34	25.40	NM
	4/21/92		11.62	25.12	ND
	5/28/92		12.10	24.64	ND
	6/28/92		12.81	23.93	0.03
	9/24/92			Not Measured	
	10/8/92		14.03	22.71	0.40
	11/3/92		13.85	22.89	0.20
	12/4/92		13.94	22.80	0.41
	1/26/93		10.00	26.74	Sheen
	2/25/93		9.74	27.00	Sheen
	3/4/93		9.70	27.04	Sheen
	4/30/93		10.20	26.56	0.02
	5/27/93		10.55	26.20	0.01
	6/23/93	Not Accessible - Auto Parked on Well			
	7/26/93		11.41	25.36	0.04
	8/19/93		11.82	24.94	0.02
	9/14/93		12.20	24.56	0.02
	10/19/93	Not Accessible - Auto Parked on Well			
	3/29/94		10.94	25.82	0.02
Resurveyed	8/3/94	36.74			
	8/17/94		12.23	24.53	0.03
	11/16/94		12.04	24.80	0.13

Table 1
Groundwater Elevation Data
20499 Hesperian Boulevard, Hayward, CA

Well	Date	Top of Casing Elevation	Depth to Water	Elevation of Groundwater	Floating Product Thickness
MW-4K	3/23/90	36.37			
	1/29/92		13.65	22.73	----
	2/28/92		11.70	24.67	----
	3/26/92		11.53	24.84	----
	4/21/92		11.45	24.92	----
	5/28/92		12.35	24.02	----
	6/28/92		12.54	23.83	----
	9/24/92		13.50	22.87	None
	10/8/92		13.50	22.87	None
	11/3/92		13.36	23.01	None
	12/4/92		13.36	23.01	None
	1/26/93		9.80	26.57	None
	2/25/93		9.50	26.87	None
	3/4/93		9.62	26.75	None
	4/30/93		10.28	26.09	None
	5/27/93		10.42	25.95	None
	6/23/93		10.82	25.55	None
	7/26/93		11.16	25.21	None
	8/19/93		11.57	24.80	None
	9/14/93		11.82	24.55	None
	10/19/93		12.10	24.27	None
	3/29/94		9.33	24.95	None
Resurveyed	8/3/94	36.34			
	8/17/94		12.02	24.32	None
	11/16/94		11.73	24.61	None
Depth to water measured in feet below top of casing.					
Elevations are based on City of Hayward Datum (Mean Sea Level)					
Elevation is corrected for product thickness when floating product appears on groundwater.					
----	Not Available				

Table 2
Groundwater Analytical Data
20499 Hesperian Boulevard, Hayward, CA

Well	Date	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes
MW-4A	1/29/92	10,000	17	22	200	43
	9/24/92	4,800	99	20	310	22
	3/4/93	2,700	2.4	<0.5	92	6.4
	9/14/93	6,800	55	<0.5	140	41
	3/29/94	5,600	41	<0.5	49	15
	8/17/94	2,000	52	6.4	120	12
	11/16/94	9,400	<5	36	75	91
MW-4B	1/29/92	8,600	1,110	<5	170	60
	9/24/92	7,900	1,800	1.1	970	420
	3/4/93	6,300	27	1.1	85	240
	9/14/93	Not Sampled				
	3/29/94	Not Sampled				
	8/17/94	Not Sampled				
	11/16/94	40,000	3,300	5,100	1,200	6,300
MW-4C	1/29/92	900	29	5	4.2	12
	9/24/92	620	7.7	8	6.7	4.1
	3/4/93	Not Sampled				
	9/14/93	12,000	20	220	72	51
	3/29/94	130,000	280	48	940	1,300
	8/17/94 - 11/16/94	Not Sampled				
MW-4D	1/29/92	850	<0.5	17	14	34
	9/24/92	290	3.9	<0.5	4.9	5.1
	3/4/93	280	2.9	<0.5	<0.5	4.4
	9/14/93	380	0.71	8.6	46	4.2
	3/29/94	200	0.9	<0.5	<0.5	<0.5
	8/17/94	540	<0.5	<0.5	2	5.3
	11/16/94	500	<0.5	<0.5	1.3	1.9
MW-4E	1/29/92	5,700	310	820	130	730
	9/24/92	37,000	2,100	5,800	1,700	5,100
	3/4/93	Not Sampled				
	9/14/93	Not Sampled				
	3/29/94	71,000	3,600	10,000	1,800	9,200
	8/17/94	28,000	4,600	2,300	850	4,000
	11/16/94	Not Sampled				
MW-4F	9/24/92 - 11/16/94	Not Sampled				
MW-4G	9/24/92 - 11/16/94	Not Sampled				
MW-4H	9/24/92 - 11/16/94	Not Sampled				

Table 2
Groundwater Analytical Data
20499 Hesperian Boulevard, Hayward, CA

Well	Date	TPHg	Benzene	Toluene	Ethyl-benzene	Total Xylenes
MW-4I	1/29/92	1,900	17	8.9	14	32
	9/24/92	Not Sampled				
	3/4/93	630	0.9	<0.5	4.1	4.3
	9/14/93	720	4.5	7.3	4.6	3.9
	3/29/94	1,500	16	<0.5	4.5	<0.5
	8/17/94	1,000	19	19	4.7	13
	11/16/94	1,900	5.7	7.4	5.7	7.1
MW-4J	9/24/92 - 11/16/94	Not Sampled				
MW-4K	1/29/92	930	<0.5	1.7	1.8	6.3
	9/24/92	Not Sampled				
	3/4/93	1,500	3.1	<0.5	8.3	16
	9/14/93	270	0.89	<0.5	1.5	3.2
	3/29/94	14,000	30	11	140	250
	8/17/94	2,800	2.2	<0.5	2.8	7.6
	11/16/94	1,500	1.3	0.6	1.5	4.7
Results in parts per billion						
TPHg	Total petroleum hydrocarbons analyzed as gasoline.					
<	Less than the detection limit for the specified method of analysis.					

(MS590-04
3 of 9

Hayward - 20501 Hesperian Blvd.

TABLE 1

SUMMARY OF UNOCAL MONITORING DATA

Well #	Ground Water Elevation (feet)	Depth to Water (feet)♦	Total Well Depth (feet)♦	Product Thickness (feet)	Sheen	Water Purged (gallons)
(Monitored and Sampled on November 16, 1994)						
MW2	24.52	12.68	21.94	0	No	6.5
MW3	24.70	12.87	22.75	0	No	7
MW4	24.68	12.14	22.36	0	No	7
MW5*	24.82	12.48	22.34	0	--	0
MW6*	24.76	13.36	23.90	0	--	0
MW7*	24.64	12.06	23.70	0	--	0
MW8	24.79	13.68	22.32	0	No	6
(Monitored and Sampled on August 17, 1994)						
MW2	24.27	12.93	21.90	0	No	6.5
MW3	24.47	13.10	22.71	0	No	7
MW4	24.50	12.32	22.30	0	No	7
MW5	24.60	12.70	22.30	0	No	7
MW6	24.54	13.58	23.86	0	No	7
MW7	24.40	12.30	23.70	0	No	8
MW8	24.58	13.89	22.28	0	No	6
(Monitored and Sampled on April 5, 1994)						
MW2	25.41	11.87	21.92	0	No	7
MW3	25.57	12.03	22.71	0	No	7.5
MW4	25.55	11.28	22.34	0	No	8
MW5	25.71	11.62	22.32	0	No	7.5
MW6	25.68	12.51	23.87	0	No	8
MW7	25.50	11.25	23.70	0	No	8.5
MW8	25.66	12.81	22.29	0	No	6.5

Post-it® Fax Note 7671	Date	# of pages ▶
To Ed Buskirk	From SARKIS KARKARIAN	
Co./Dept. P.E.G.	Co. M.P.D.S.	
Phone #	Phone # (510) 602-5120	
Fax #	Fax # (510) 689-1918	

MPDS-UN5590-04
Page 5 of 9

Hayward – 20501 Hesperian Blvd.

Post-it® Fax Note 7671	Date	# of pages ▶ 1
To Ed Buskirk	From SARKIS KARKARIAN	
Co./Dept. P.E.G.	Co. M.P.D.S.	
Phone #	Phone # (510) – 602 – 5120	
Fax #	Fax # (510) – 689 – 1918	

TA

SUMMARY OF LA
W

Date	Well #	TPH as Diesel	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes
11/16/94	MW2	ND	76	ND	ND	ND	ND
	MW3	73*	91	1.1	0.58	ND	ND
	MW4	1,400*	3,300	28	ND	ND	9.5
	MW5	SAMPLED SEMI-ANNUALLY					
	MW6	SAMPLED SEMI-ANNUALLY					
	MW7	SAMPLED SEMI-ANNUALLY					
	MW8	930*	ND	ND	ND	ND	ND
8/17/94	MW2	61*	ND	ND	ND	ND	ND
	MW3	110*	280	0.60	7.0	ND	1.0
	MW4	1,400*	5,400	22	22	7.3	9.8
	MW5	58*	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND	ND
	MW7	ND	ND	ND	ND	ND	ND
	MW8	1,000*	2,100	30	15	ND	17
4/05/94	MW2	68*	200	ND	0.74	ND	ND
	MW3	180*	480	3.1	1.2	3.7	0.62
	MW4	1,700*	5,600	52	13	7.7	5.1
	MW5	ND	ND	ND	ND	ND	ND
	MW6	ND	ND	ND	ND	ND	ND
	MW7	ND	ND	ND	ND	ND	ND
	MW8	980*	3,100	ND	9.8	ND	9.8
1/11/94	MW2▲▲	53**	70	ND	ND	ND	ND
	MW3	130**	220	ND	0.71	0.57	ND
	MW4	1,200**	4,100	19	ND	7.9	6.4
	MW5	SAMPLED SEMI-ANNUALLY					
	MW6	SAMPLED SEMI-ANNUALLY					
	MW7	SAMPLED SEMI-ANNUALLY					
	MW8	1,300**	3,900	34	ND	14	18

* Sequoia Analytical Laboratory reported that the hydrocarbons detected did not appear to be diesel.

BLAINE TECH SERVICES INC.

985 TIMOTHY DRIVE
SAN JOSE, CA 95133
(408) 995-5535
FAX (408) 293-8773

December 20, 1994

Shell Oil Company
P.O. Box 4023
Concord, CA 94524

Attn: Lynn Walker

RECEIVED
DEC 22 1994
EMCON/SACRAMENTO

SITE:
Shell WIC #204-3336-1704
20500 Hesperian Blvd.
Hayward, California

QUARTER:
4th quarter of 1994

QUARTERLY GROUNDWATER SAMPLING REPORT 941116-J-1

This report contains data collected during routine inspection, gauging and sampling of groundwater monitoring wells performed by Blaine Tech Services, Inc. in response to the request of the consultant who is overseeing work at this site on behalf of our mutual client, Shell Oil Company. Data collected in the course of our field work is presented in a TABLE OF WELL GAUGING DATA. The field information was collected during our preliminary gauging and inspection of the wells, the subsequent evacuation of each well prior to sampling, and at the time of sampling.

Measurements taken include the total depth of the well and the depth to water. The surface of water was further inspected for the presence of immiscibles which may be present as a thin film (a sheen on the surface of the water) or as a measurable free product zone (FPZ). At intervals during the evacuation phase, the purge water was monitored with instruments that measure electrical conductivity (EC), potential hydrogen (pH), temperature (degrees Fahrenheit), and turbidity (NTU). In the interest of simplicity, fundamental information is tabulated here, while the bulk of the information is turned over directly to the consultant who is making professional interpretations and evaluations of the conditions at the site.

STANDARD PROCEDURES

Evacuation

Groundwater wells are thoroughly purged before sampling to insure that the sample is collected from water that has been newly drawn into the well from the surrounding geologic formation. The selection of equipment to evacuate each well is based on the physical characteristics of the well and what is known about the performance of the formation in which the well has been installed. There are several suitable devices which can be used for evacuation. The most commonly employed devices are air or gas actuated pumps, electric submersible pumps, and hand or mechanically actuated bailers. Our personnel frequently employ USGS/Middleburg positive displacement pumps or similar air actuated pumps which do not agitate the water standing in the well.

Normal evacuation removes three case volumes of water from the well. More than three case volumes of water are removed in cases where more evacuation is needed to achieve stabilization of water parameters and when requested by the local implementing agency. Less water may be obtained in cases where the well dewaters and does not recharge to 80% of its original volume within two hours and any additional time our personnel have reason to remain at the site. In such cases, our personnel return to the site within twenty four hours and collect sample material from the water which has recharged into the well case.

Decontamination

All apparatus is brought to the site in clean and serviceable condition. The equipment is decontaminated after each use and before leaving the site. Effluent water from purging and on-site equipment cleaning is collected and transported to Shell's Martinez Manufacturing Complez in Martinez, California.

Free Product Skimmer

The column headed, VOLUME OF IMMISCIBLES REMOVED (ml) is included in the TABLE OF WELL GAUGING DATA to cover situations where a free product skimming device must be removed from the well prior to gauging. Skimmers are installed in wells with a free product zone on the surface of the water. The skimmer is a free product recovery device which often prevents normal well gauging and free product zone measurements. The 2.0" and 3.0" PetroTraps fall into the category of devices that obstruct normal gauging. In cases where the consultant elects to have our personnel pull the skimmers out of the well and gauge the well, our personnel perform the additional task of draining the accumulated free product out of the PetroTrap before putting it back in the well. This

recovered free product is measured and logged in the VOLUME OF IMMISCIBLES REMOVED column. Gauging at such sites is performed in accordance with specific directions from the professional consulting firm overseeing work at the site on Shell's behalf.

Sample Containers

Sample material is collected in specially prepared containers which are provided by the laboratory that performs the analyses.

Sampling

Sample material is collected in stainless steel bailer type devices normally fitted with both a top and a bottom check valve. Water is promptly decanted into new sample containers in a manner which reduces the loss of volatile constituents and follows the applicable EPA standard for handling volatile organic and semi-volatile compounds.

Following collection, samples are promptly placed in an ice chest containing prefrozen blocks of an inert ice substitute such as Blue Ice or Super Ice. The samples are maintained in either an ice chest or a refrigerator until delivered into the custody of the laboratory.

Sample Designations

All sample containers are identified with a site designation and a discrete sample identification number specific to that particular groundwater well. Additional standard notations (e.g. time, date, sampler) are also made on the label.

Chain of Custody

Samples are continuously maintained in an appropriate cooled container while in our custody and until delivered to the laboratory under a standard Shell Oil Company chain of custody. If the samples are taken charge of by a different party (such as another person from our office, a courier, etc.) prior to being delivered to the laboratory, appropriate release and acceptance records are made on the chain of custody (time, date, and signature of the person releasing the samples followed by the time, date and signature of the person accepting custody of the samples).

Hazardous Materials Testing Laboratory

The samples obtained at this site were delivered to Crosby Laboratories, Inc. in Anaheim, California. Crosby Laboratories, Inc. is a California Department of Health Services certified Hazardous Materials Testing Laboratory and is listed as DOHS HMTL #1552.

Objective Information Collection

Blaine Tech Services, Inc. performs specialized environmental sampling and documentation as an independent third party. In order to avoid compromising the objectivity necessary for the proper and disinterested performance of this work, Blaine Tech Services, Inc. performs no consulting and does not become involved in the marketing or installation of remedial systems of any kind. Blaine Tech Services, Inc. is concerned only with the generation of objective information, not with the use of that information to support evaluations and recommendations concerning the environmental condition of the site. Even the straightforward interpretation of objective analytical data is better performed by interested regulatory agencies, and those engineers and geologists who are engaged in the work of providing professional opinions about the site and proposals to perform additional investigation or design remedial systems.

Reportage

Submission of this report and the attached laboratory report to interested regulatory agencies is handled by the consultant in charge of the project. Any professional evaluations or recommendations will be made by the consultant under separate cover.

Please call if we can be of any further assistance.

James Blaine Jr.

Richard C. Blaine

RCB/lp

attachments: table of well gauging data
chain of custody
certified analytical report

cc: EMCON Associates
1433 N. Market Blvd.
Sacramento, CA 95834-1943
ATTN: Bob Husk

TABLE OF WELL GAUGING DATA

WELL I.D.	DATA COLLECTION DATE	MEASUREMENT REFERENCED TO	QUALITATIVE OBSERVATIONS (sheen)	DEPTH TO FIRST IMMISCIBLES LIQUID (FPZ) (feet)	THICKNESS OF IMMISCIBLES LIQUID ZONE (feet)	VOLUME OF IMMISCIBLES REMOVED (ml)	DEPTH TO WATER (feet)	DEPTH TO WELL BOTTOM (feet)
S-1	11/16/94	TOC	–	NONE	–	–	11.35	24.35

S-1 TOC ELEV.
36.56'

CROSBY LABORATORIES INCORPORATED

Analytical Report

1101 South Richfield Road Placentia, California 92670 • 714-777-1425 • 1-800-3 CROSBY • FAX 714-777-3926

ENVIRONMENTAL • CHEMICAL • MICROBIOLOGICAL • TESTING SERVICES

LAB RECEIVING #: **9411.136**

REPORT DATE: 12/15/94

REPORTED TO: BLAINE TECH SERVICES, INC.
ATTN.: MR. JIM KELLER
985 TIMOTHY DRIVE
SAN JOSE, CA 95133

WIC #: 204-3336-1704
PROJECT #: 941116J1
PROJECT NAME: SHELL-20500 HESPERIAN BLVD., HAYWARD

DATE SAMPLED: 11/16/94
DATE RECEIVED: 11/17/94
 # OF SAMPLES: 2

SAMPLE MATRIX: LIQUID

SAMPLE ID: S-1
T.B.

SAMPLE HANDLING & CONTROL STATEMENT

The above mentioned samples were received in appropriate containers accompanied by a fully signed and dated chain-of-custody record. The containers were assigned unique identification numbers and had sufficient amount for the test requested. There were no site specific quality control requirements made at the time of sample submittal. Samples submitted did not exceed the holding time of the requested test parameters.

QUALITY CONTROL SUMMARY STATEMENT

Laboratory Quality Control parameters and results of instrument calibration standards were all within control limits and the analytical data hereby submitted falls within acceptable limits of accuracy and precision unless otherwise indicated. Please see the attached Quality Control Data for additional information.

SUBMITTED BY:

Girma Selassie
QA/QC Director

CERTIFICATE OF APPROVED ANALYSIS

The information contained in this cover sheet is an integral part of the attached analytical report.

DOHS Lab Certificate #: 1552
Expiration Date: 6/30/95

A2LA Certificate #: 0369.01
Expiration Date: 9/30/94

CROSBY LABORATORIES INCORPORATED
1101 South Richfield Road Placentia, California 92670 • 714-777-1425 • 1-800-3 CROSBY • FAX 714-777-3926
ENVIRONMENTAL • CHEMICAL • MICROBIOLOGICAL • TESTING SERVICES

Analytical Report

CLIENT: BLAINE TECH SERVICES, INC.
ATTN.: MR. JIM KELLER
LAB RECEIVING#: 9411.136

WIC #: 204-3336-1704
PROJECT #: 941116J1
PROJECT NAME: SHELL-20500 HESPERIAN BLVD., HAYWARD

Spl. Prep. Meth.: EPA 5030

MATRIX: LIQUID
UNIT: µg/l

Prepared: 11/23/94
Analyzed: 11/23/94
Analyst: AR

			EPA 8020 (Partial)/8015 TPH-Modified (Gasoline)					%Surrogate Recovery	
Lab ID	Client Sample ID	D.F.	Benzene	Toluene	Ethyl Benzene	Total Xylene	TPH Gasoline	BTEX (75-135)	TPH (75-135)
RA112394	METHOD BLANK	1	ND	ND	ND	ND	ND	103	100
AA53271	S-1	1	ND	0.3	ND	ND	ND	102	103
AA52812	T.B.	1	ND	ND	ND	ND	ND	102	102
DETECTION LIMITS			0.3	0.3	0.3	0.6	50		

QUALITY CONTROL DATA, EPA-8020Part./8015Mod.

	ACCURACY						PRECISION	
LABORATORY CONTROL STANDARD/DUPLICATE	SPIKE CONC. (µg/l)	LCS (µg/l)	% LCS	LCSD (µg/l)	% LCSD	ACP % LCS	RPD	ACP % RPD
Benzene	8.0	8.0	100	8.4	105	75-125	5	0-25
Toluene	8.0	8.5	106	8.9	111	75-125	5	0-25
Ethyl Benzene	8.0	8.6	107	8.9	111	75-125	4	0-25

AUDIT DATA	LAB ID	BATCH #	QC STD #	ANALYZED
	LABORATORY CONTROL STANDARD (LCS)	BT112394	GC148	11/23/94

	ACCURACY						PRECISION	
MATRIX SPIKE/ MATRIX SPIKE DUPLICATE	SPIKE CONC. (µg/l)	MS (µg/l)	% MS	MSD (µg/l)	% MSD	ACP % MS	RPD	ACP % RPD
Benzene	8.0	7.9	98	8.2	102	80-120	4	0-25
Toluene	8.0	8.0	100	8.5	106	80-120	6	0-25
Ethyl Benzene	8.0	8.0	100	8.3	104	80-120	4	0-25

AUDIT DATA	LAB ID	SAMPLE ID	BATCH #	QC STD #	ANALYZED
	AA52867	DISCHARGE	BT112394	GC148	11/23/94

NOTES:

ND denotes Not Detected at the indicated Limit Of Quantitation (LOQ).
The Laboratory Control Standard (LCS) is a control sample of known interference free matrix that is analyzed using the same reagents, preparation and analytical methods employed for this set of samples. The LCS percent recovery data verifies method and system performance and is used for validation of sample batch results. The MS/MSD results are not used to determine the acceptance or rejection of batch analyses due to the potential impact of matrix effects. These results are included as sample related information only and should be evaluated accordingly.

This report is preceded by a cover sheet that contains vital information.

R1-4

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No: 941116-31 9411.1316 1/30

Date: 11/1/94
Page 1 of 1

Site Address: 20500 Hesperian Blvd, Hayward, CA

WIC#: 204-3336-1704

Shell Engineer: Lynn Walker — Phone No.: (510) 675-6169 Fax #: 675-6172

Consultant Name & Address: Blaine Tech Services
985 Timothy Drive, San Jose, CA

Consultant Contact: Jim Keller — Phone No.: (408) 458-9765 Fax #: 293-8773

Comments:

Sampled by:
Printed Name: JEAN GATINEAU

LAB: CROSBY

CHECK ONE (1) BOX ONLY		CT/DT	TURN AROUND TIME	
Quarterly Monitoring	[X]	5461	24 hours	[ ]
Site Investigation	[ ]	5441	48 hours	[ ]
Soil Classify/Disposal	[ ]	5442	15 days	[X] (Normal)
Water Classify/Disposal	[ ]	5443	Other	[ ]
Soil/Air Rem. or Sys. O & M	[ ]	5452	NOTE: Notify Lab as soon as Possible of 24/48 hrs. TAT.	
Water Rem. or Sys. O & M	[ ]	5453		
Other	[ ]			

Analysis Required

Sample ID	Date	Sludge	Soil	Water	Air	No. of conts.	TPH (EPA 8015 Mod. Gas)	TPH (EPA 8015 Mod. Diesel)	BTEX (EPA 8020/602)	Volatile Organics (EPA 8240)	Test for Disposal	Combination TPH 8015 & BTEX 8020			Asbestos	Container Size	Preparation Used	Composite Y/N	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
																				AA53271
S-1	11/16			W		3						X								~~AA53811~~ 98
T.B.	11/16			W		2						X								AA53812

Relinquished By (signature):	Printed Name:	Date/Time:	Received (signature):	Printed Name:	Date/Time:
[signature]	JEAN GATINEAU	Date: 11/17/94 Time: 09:40	[signature]	B CAPOCCIA	Date: 11/17/94 Time: 09:40
[signature]	B CAPOCCIA	Date: 11/17/94 Time: 15:25	[signature] 1536	[illegible]	Date: Time:
		Date: Time:	[signature]	Jenny Buramian	Date: 11/18/94 Time: 10:00

THE LABORATORY MUST PROVIDE A COPY OF THIS CHAIN-OF-CUSTODY WITH INVOICE AND RESULTS

SHELL WELL MONITORING DATA SHEET

Project #: 94111 J1	WIC # 204-3336-1704
Sampler: J.G.	Date Sampled: 11/16/94
Well I.D.: S-1	Well Diameter: (circle one) 2 3 (4) 6 ____
Total Well Depth: Before 24.35 After	Depth to Water: Before 11.35 After
Depth to Free Product:	Thickness of Free Product (feet):
Measurements referenced to: (PVC) Grade Other --	

Volume Conversion Factor (VCF): $\{12 \times (d^2/4) \times \pi\}/231$
where
12 = in/foot
d = diameter (in.)
π = 3.1416
231 = in³/gal

Well dia.		VCF
2"	=	0.16
3"	=	0.37
4"	=	0.65
6"	=	1.47
10"	=	4.08
12"	=	5.87

8.4 (1 Case Volume) x 3 (Specified Volumes) = 25.2 gallons

Purging: Bailer ☐ · Middleburg ☐ · Electric Submersible ☒ · Suction Pump ☐ · Type of Installed Pump ____

Sampling: Bailer ☒ · Middleburg ☐ · Electric Submersible ☐ · Suction Pump ☐ · Installed Pump ☐

TIME	TEMP. (F)	pH	COND.	TURBIDITY:	VOLUME REMOVED:	OBSERVATIONS:
8:59	58.4	7.8	1800	27.	9	
9:01	60.2	8.0	1600	21.	18	
9:03	61.4	7.8	1600	87.	27	

Did Well Dewater? NO If yes, gals.	Gallons Actually Evacuated: 27
Sampling Time: 9:10	
Sample I.D.: S-1	Laboratory: CROSBY
Analyzed for: TPHG, BTEX	
Duplicate I.D.:	Cleaning Blank I.D.:
Analyzed for:	
Shipping Notations:	
Additional Notations:	

WELL HEAD INSPECTION CHECKLIST AND REPAIR ORDER

Client SHELL Site # 204-3336-1704 Inspection date: 11/16/94

Site address 20500 HESPERIAN BL Inspected by: J.G.

HAYWARD, CA. BTS Event # 941116J1

1. Lid on the box? Yes No	5. Water standing in the well box?	7. Can cap be pulled loose?
2. Lid whole?	5a. Standing above well top?	8. Can cap seal out water?
3. Lid secure?	5b. Standing below well top?	9. Padlock present?
4. Lid seal intact?	5c. Water even with top of well cap?	10. Padlock found locked?
	6. Well cap/plug present?	11. Padlock functional?

☒ Check box if *no deficiences* were found. Note below deficiencies you were able to correct.

Well I.D.	Deficiency	Corrective Action Taken

Note below all deficiences that could not be corrected and *still need to be corrected.*

Well I.D.	Persisting Deficiency	BTS Office assigns or defers Correction to:	Date assigned	Date corrected

Office review and assignments made by _____ date _____

Growth Environmental Services, Inc.

(Formerly Certified Environmental Consulting, Inc.)

536 Stone Rd. Suite J
Benicia, CA 94510
707-745-0171
Fax: 707-745-0163

FAX TRANSMISSION COVER SHEET

Date: *February 2, 1995*

To: *Ed Buskirk*

Fax: *408-441-7539*

Re: *Data for Airport Alliance*

From: *Gary Rogers*

YOU SHOULD RECEIVE 6 PAGE(S), INCLUDING THIS COVER SHEET. IF YOU DO NOT RECEIVE ALL THE PAGES, PLEASE CALL 707-745-0171.

I have attached the sampling data for Airport Alliance. Please let me know if you have any questions.

Thanks,

Gary Rogers

McCAMPBELL ANALYTICAL INC. | 110 2nd Avenue South, #D7, Pacheco, CA 94553
Tele: 510-798-1620 Fax: 510-798-1622

Certified Environmental Consulting 536 Stone Road, Ste. J Benicia, CA 94510-1016	Client Project ID: # 510-1440-2; Airport Alliance	Date Sampled: 11/16/94
		Date Received: 11/18/94
	Client Contact: Christopher Wong	Date Extracted: 11/18/94
	Client P.O: # 1180	Date Analyzed: 11/18/94

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with BTEX*

EPA methods 5030, modified 8015, and 8020 or 602; California RWQCB (SF Bay Region) method GCFID(5030)

Lab ID	Client ID	Matrix	TPH(g)+	Benzene	Toluene	Ethylben-zene	Xylenes	% Rec. Surrogate
42470	MW-2-2	W	130,c	11	1.3	0.91	ND	110
42471	MW-1-2	W	1100,a	270	43	14	36	122#
Detection Limit unless otherwise stated; ND means Not Detected		W	50 ug/L	0.5	0.5	0.5	0.5	
		S	1.0 mg/kg	0.005	0.005	0.005	0.005	

*water samples are reported in ug/L, soil samples in mg/kg, and all TCLP extracts in mg/L

cluttered chromatogram; sample peak co-elutes with surrogate peak

+ The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds are significant, no recognizable pattern; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible phase is present.

DHS Certification No. 1644

Edward Hamilton, Lab Director

McCAMPBELL ANALYTICAL INC. | 110 2nd Avenue South, #D7, Pacheco, CA 94553
Tele: 510-798-1620 Fax: 510-798-1622

Certified Environmental Consulting 536 Stone Road, Ste. J Benicia, CA 94510-1016	Client Project ID: # 510-1440-2; Airport Alliance	Date Sampled: 11/16/94
		Date Received: 11/18/94
	Client Contact: Christopher Wong	Date Extracted: 11/18/94
	Client P.O: # 1180	Date Analyzed: 11/18/94

Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel *

EPA methods modified 8015, and 3550 or 3510; California RWQCB (SF Bay Region) method GCFID(3550) or GCFID(3510)

Lab ID	Client ID	Matrix	TPH(d)+	% Recovery Surrogate
42470	MW-2-1	W	ND	102
42471	MW-1-1	W	270,d	102
Detection Limit unless otherwise stated; ND means Not Detected		W	50 ug/L	
		S	10 mg/kg	

*water samples are reported in ug/L, soil samples in mg/kg, and all TCLP extracts in mg/L

cluttered chromatogram; surrogate and sample peaks co-elute or surrogate peak is on elevated baseline

+ The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) modified diesel?; light(c_L) or heavy(c_H) diesel compounds are significant); d) gasoline range compounds are significant; e) medium boiling point pattern that does not match diesel(?); f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible phase is present.

DHS Certification No. 1644

Edward Hamilton, Lab Director

3268ACEC686

CENTRAL ENVIRONMENTAL CONSULTING INC.

536 Stone Road, Ste. J., Benicia, CA 94510-1016
Ofc. (707) 745-0171 (800) 228-0171 Fax. (707) 745-0163

CHAIN OF CUSTODY RECORD

Laboratory Analysis P.O. No. 1180
Laboratory: Please Call Accounts Payable for P.O. No.

Date 11/16/94 Sheet 1 of 1

Project Number: 510-1440-2
Project Name: Airport Alliance
Address: 20450 Hesperian Blvd.
Hayward, CA
Sampler's Name: CHRISTOPHER WONG
Sampler's Signature: Christopher Wong

Lab Name: McCampbell Analytical
Address:
Phone Number: (510) 798-16..
Turnaround Time: ☐ Rush ☐ 24 Hour ☐ 48 Hour ☑ 5-Day
Report to:

Sample Number	Location	Date	Time	TPH as Gasoline 8015	TPH as Diesel 8015	TPH-G and B.T.E.X 8015/8020	B.T.X.& E 8020	Oil and Grease 5520	Volatile Organics (8010)	CAM Metals (17)	Pr. Pollutant Metals (13)	Base/Neu/Acids (Organic)	Pesticides 8140/8141						Matrix (Soil/Water)	Comments
MW-2-1		11/16/94	11:30		X														W	42470
MW-2-2		↓	11:30			X													↓	
MW-2-3		↓	11:30			X													↓	
MW-1-1		↓	3:45		X														↓	42471
MW-1-2		↓	3:45			X													↓	
MW-1-3		↓	3:45			X													↓	

Relinquished By	Date	Time	Received By	Date	Time
1. Chris Wong	11/18	9:20	1. James O'McLean	11-18	920
2. Jas O'McLe	11-18	940	2. Heidi Ruiz	11-18-94	9:40 Am
3.			3.		
Dispatched By	Date	Time	Received in Lab By	Date	Time

Total Number of Containers This Sheet: 6
Method of Shipment:
Special Shipment / Handling or Storage Requirements:

ICE/T° ✓ GOOD CONDITION ✓ HEAD SPACE ABSENT ✓
PRESERVATIVE ✓ APPROPRIATE CONTAINERS ✓
VOAS | O&G | METALS | OTHER

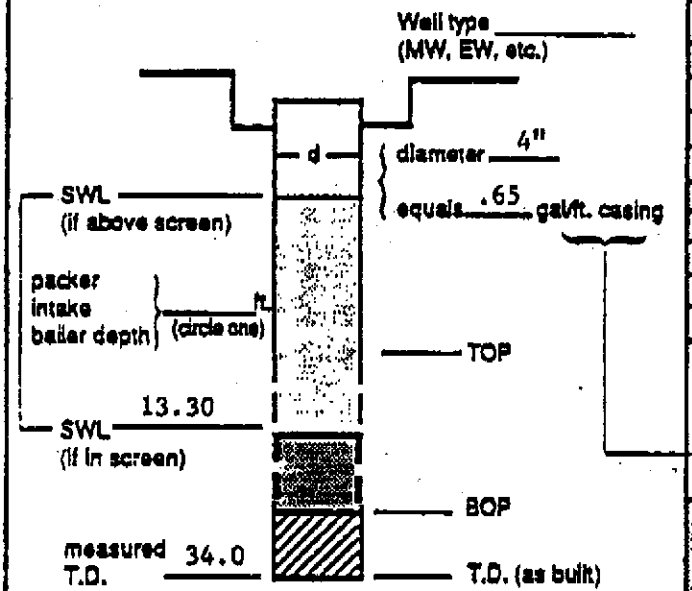
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION B-6/MW-1

510-1440-2
PROJECT Airport Alliance EVENT Qrtly. Monit. SAMPLER C. Wong DATE 11/16/94

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	12:15		
Stop pump	1:30		
Restart pump	3:15		
Stop pump	3:30		
Stop			
Sampled			
(Final IWL)			

Purge calculation

.65 gal/ft. • 20.70 ft. = 13.46 gals x 3 = 40.37 gals.

SWL to BOP or packer to BOP | one volume | purge volume - 3 casings

Head purge calculation (Airlift only)

___ gal/ft. • ___ ft. = ___ gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

2" Submersible Pump
Pump Control Box
Generator
40' Nylon Braided Tubing
HYDAC Meter
Water Level Meter
Ice Chest

Actual gallons purged 18

Actual volumes purged 1 1/3

Well yield ⊕ (see below) VLY

COC # ___

Sample I.D.	Analysis	Lab

Additional comments:

SWL at moment of pumping 12.95 ft

I saw 9 unlabeled drums, some of them full, next to the main building near the restroom. I saw 32 additional drums in the alley between the office & Weber Auto Supply, bearing CEC labels.

Gallons purged *	TEMP °C / (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)	Time	W.L.
1. 13.5	70.4	9.84	5.75		1.00	23.47
2. 18.0	66.6	10.75	6.45		3.45	24.59
3.						
4.						
5.						

* Take measurement at approximately each casing volume purged.

⊕ HY - Minimal W.L. drop

MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump.

LY - Able to purge 3 volumes by returning later or next day.

VLY - Minimal recharge - unable to purge 3 volumes.

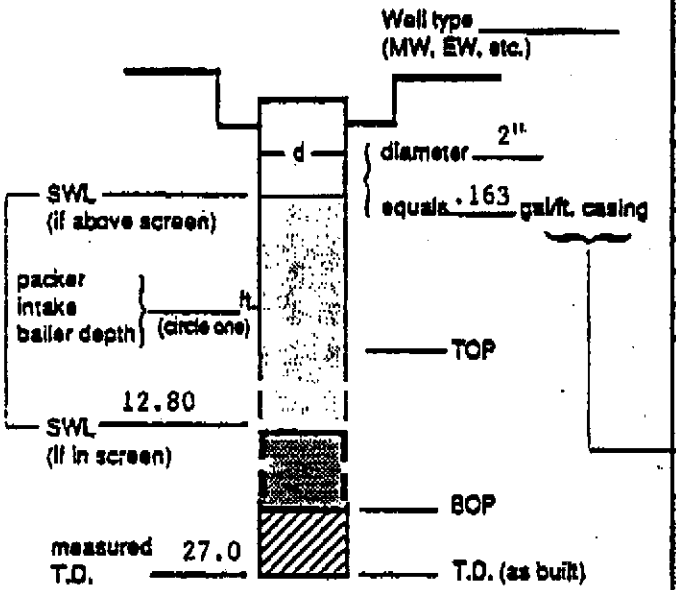
SAMPLING EVENT DATA SHEET

(fill out completely)

WELL OR LOCATION B-9/MW-2

510-1440-2
PROJECT Airport Alliance EVENT Qrtly. Monit. SAMPLER C.Wong DATE 11/16/94

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	10:50		
Stop	11:12		
Sampled	11:30		
(Final IWL)			

Purge calculation

.163 gal/ft. * 14.20 ft. = 2.3 gals x 3 = 6.9 gals.

SWL to BOP or packer to BOP | one volume | purge volume= 3 casings

Head purge calculation (Airlift only)

gal/ft. * ft. = gals.

packer to SWL

Equipment Used / Sampling Method / Description of Event:

2" Submersible Pump
Pump Control Box
Generator
35'Nylon Braided Tubing
HYDAC Meter
Water Level Meter
Ice Chest

Actual gallons purged

Actual volumes purged

Well yield ⊕ (see below)

COC #

Sample I.D.	Analysis	Lab

Additional comments:

Gallons purged *	TEMP °C (°F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)	Time	W.L.
1. 2.3	69.2	800	7.51	0.62	10:55	16.25
2. 4.6	67.9	856	7.30	0.62	11:00	
3. 6.9	66.9	881	7.15	0.63	11:07	16.38@11:05
4.						
5.						

* Take measurement at approximately each casing volume purged.

⊕ HY - Minimal W.L. drop

MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump.

LY - Able to purge 3 volumes by returning later or next day.

VLY - Minimal recharge - unable to purge 3 volumes.

ATTACHMENT D

SOIL VAPOR EXTRACTION SYSTEM PERFORMANCE DATA

CG

FIELD SERVICES / O&M REQUEST

Work Order # 2849

SITE INFORMATION FORM

Initials	Date
F/S	CG 11/8
Copy/Dist.	[illegible] 11/10

Identification

Project #: 330110SA
Station #: 5387
Site Address: 20200 HESPERIAN BOULEVARD HAYWARD, CA
County:
Project Manager: SHAN G.
Requestor: DAVID N
Client: ARCO
Client P.O.C.: M.W
Date of request: 10/25/94

Project Type

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

Ideal field date(s): ASAP

Prefield/Contacts/Permits

- [ ] Cal Trans
- [ ] County
- [ ] City
- [ ] Private
- [ ] Multi-Consultant Scheduling date(s):

Check Appropriate Category

Budget Hrs.
Actual Hrs. 5.5
Mob de Mob 1

Field Tasks: For General Description

OBJECTIVE; SYSTEM START-UP AND MONITORING

1) SYSTEM IS COMPOSED OF 3, 1,000 lb CARBON VESSELS, A 5 H.P. BLOWER, VE WELLS MW-1, MW-3, AV-1, AV-3, AV-4 AND AS-1. A 3 H.P. SPARGE BLOWER AND AIR SPARGE WELLS AS-1 THROUGH AS-9. PLEASE VERIFY.

2) CHECK SVE BLOWER AND SPARGE BLOWER FOR MAX AMP DRAW VALUE AND RECORD, CHECK OIL LEVEL IN BOTH SVE BLOWER AND SPARGE BLOWER (OBTAIN HOUR METER READINGS FOR

3) OPEN ALL SVE WELLS AND START SVE BLOWER; MONITOR AMPERAGE DRAW
- RUN FID ON INFL AND HOT WELLS (AS-1, AV-1, MW-1) EVERY 15 MIN FOR 3 HRS. — CALL ENG. W/ DATA
- SAMPLE INFL 15 MIN AFTER SVE START-UP AND AGAIN AT END OF 3 HOURS *

4) MONITOR SVE WELLS W/ FID AND RECORD, RECORD ASSOCIATED VACUUM PRESSURES, ~~AT~~ (BE SURE SVE WELLS AS-1 AND MW-1 ARE AT MAX END OF VAC PRESSURE RANGE)

(completed)

*5) OPEN ALL SPARGE WELLS, START SPARGE BLOWER (HAND TURN BLOWER FIRST TO MAKE SURE ITS FREE), RECORD APPLIED PRESSURE PER WELL, BALANCE APPLIED PRESSURES AND RECORD (BEFORE STARTING SPARGE BLOWER MEASURE DISSOLVED O_2 ~~AND~~ IN GW MONITORING WELLS)

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

6) COMPLETE O&M DATA SHEET, OBTAIN FID READINGS AND BAG SAMPLES OF INFL, INFL AND EFFL OF CARBON #2 AND SYSTEM EFFL BEFORE LEAVING SITE. SUBMIT SAMPLES FOR GAS/BTEX ANALYSIS. OBTAIN BAG SAMPLES FROM ALL SVE WELLS AT END OF 3 HRS.* SUBMIT THIS SAMPLE ~~FOR~~ ~~RUSH~~ 48HR TURNAROUND; ALL SAMPLES ANALYZE FOR TPH-g/BTEX. ~~[illegible]~~

7) ANSWER ATTACHED QUESTIONS

8) CALL ENGINEER FROM SITE

9) RECORD BRAND NAME OF CARBON VESSELS

10) IS THERE A FIRE EXTINGUISHER ON SITE? TRIM AWAY ANY IMPEDING VEGETATION

11) SITE SAFETY PLAN ON SITE?

12) PHOTOGRAPH SITE AND ALL COMPONENTS.

Completed by: JV Date: 11-2-94

Checked by:

PACIFIC ENVIRONMENTAL GROUP, INC.

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

SVE

1) IS THERE A MANIFOLD IN SYSTEM ENCLOSURE? YES

a) IF YES, DOES MANIFOLD HAVE PRESSURE GAUGES AND VALVES? YES

b) ARE THERE SAMPLE PORTS FOR INDIVIDUAL WELLS ON MANIFOLD? YES - BUT NEED TO INSTALL SAMPLE PORTS THEY ARE PLUGED

c) COULD YOU INSTALL VALVES AND/OR SAMPLE PORTS AND/OR & PRESSURE GAUGES? YES

2) ARE THERE PRESSURE GAUGES AT THE WELL HEADS? - SAMPLE PORTS? NO PRESSURE GAUGES MOST HAVE SAMPLE PORTS

3) WHAT IS MAX AMPERAGE OF SVE BLOWER? 19.5

4) FLOW GAUGE POSITION? DIAMETER OF PIPE? IN MANIFOLD and IN A 4" PIPE

5) SOUND ENCLOSURE ON SVE BLOWER? YES

6) TEMP GAUGE ON SOUND ENCLOSURE? NO

7) KNOCK OUT DRUM IN LINE? FLOAT SWITCH OPERATING? PLEASE INSPECT YES

8) TAKE PICTURES OF REMEDIAL ENCLOSURE AND INDIVIDUAL COMPONENTS.

9) DOES SVE SYSTEM HAVE AN HOURMETER? NO

10) DOES AUTO DIALER WORK? RERECORD MESSAGE FOR PEG AND PROGRAM IN OUR PHONE NUMBER. NO AUTO DIALER

PACIFIC ENVIRONMENTAL GROUP, INC.	Project No: 330105A	Figure No:	Date: 10/25/94
			Drawn By: RDN
Title:			

SPARGE SYSTEM

1) IS THERE A SPARGE MANIFOLD IN REMEDIAL ENCLOSURE? YES

IF SO...

a) DOES MANIFOLD HAVE PRESSURE GAUGES AND VALVES? DIAMETER OF PIPE? YES 2" pipe

b) IF NOT, COULD YOU INSTALL VALVES AND/OR PRESSURE GAUGES. NO NEED TO

2) ARE THERE PRESSURE GAUGES AT THE SPARGE WELL HEADS? VALVES?

3) WHAT IS MAX AMPERAGE OF SPARGE BLOWER? 18 Amps

4) SOUND ENCLOSURE? TEMP GAUGE ON SOUND ENCLOSURE? NO

5) DOES SPARGE SYS HAVE AN HOUR METER? NO

PACIFIC ENVIRONMENTAL GROUP, INC.	Project No: 3901105A	Figure No:	Date: 10/25/94
			Drawn By: BDV
Title:			

FIELD DATA SHEET

Client: Arco

Date: 11-2-94

Job Address: 20200 Hesperian blvd
Hayward

Project No.: 330110.5A

Time Arrived:

Time Departed:

Weather Conditions:

Equipment at Site:

Personnel at Site:

FIELD NOTES

Started SVE system and Ran For 2½ Hours
Took FID Readings Every 15 min (See AH Sheet)
FID reading were High system was Shut
down As per Dave N. Sampled INFL At
Start up and sampled INFL MID EFFC
At Shut down, Well AR-1 Need well Head
Repair

Signature

330-110.5A
11-2-94

3:00	START UP	INFL	10,000+ WOC 3600 WC	EFFL	3000 WOC 3000 WC
3:15	INFL	10,000 WOC 3600 WC		EFFL	3000 WOC 3000 WC
3:30	INFL	7000 WOC 3000 WC		EFFL	3600 WOC 3000 WC
3:45	INFL	7000 WOC 3000 WC		EFFL	3200 WOC 3000 WC
~~4:00~~ 400	INFL	6400 WOC 2000 WC		EFFL	2000 WOC 2000 WC
~~4:30~~	INFL	5600 WOC 2000 WC		EFFL	2000 WOC 2000 WC
445	INFL	4200 WOC 2000 WC		EFFL	2000 WOC 2000 WC
500	INFL	4000 WOC 1600 WC		EFFL	1700 1200
515	INFL	4000 WOC 1600 WC		EFFL	1200 1200
530	INFL	3800 WOC 1400 WC		EFFL	1000 1000

	VAC MANIFOLD	WELL	P (H2O)	PIPE SIZE
MW-1	54	50	.6	2"
VALVE AT WELL HEAD MW-3	62	40	.4	2"
VALVE AT WELL HEAD AR-1 } all hook up together	close off	Needs well Head	Repair	4" Well Ho
AR-2 }	62	NO SAMPLE PORT		2"
AV-1	56	45	.3	2"
AV-3	60	48	? 1.8 WATER IN LINE	2"
AV-4	60	40	1.8	2"
AS-1	60	40	.3	2
MANIFOLD	60		2.0	3"

SOIL VAPOR EXTRACTION & AIR SPARGE SYSTEMS
FIELD MONITORING DATA SHEETS

Date: 11-2-94 Time of Arrival: 13:30

Technician: JV Time of Departure: 5:45

Site Engineer: David Nanstad, Ext. 292 Was Site Engineer or substitute contacted from field? Yes X No ____

PART A: GENERAL INFORMATION

Site Location: 20200 Hesperian Blvd., Hayward Station No.: 5387 Project No. 330-110.5A

Abatement Equip.: Three 2,000 pound activated carbon vessels Serial No.: ____

SVE Blower: 5-HP Tuthill MD-3206 Max AMP Rating: 19.5

SPG Blower: Westmoore Ltd.; Conde #6' 3-HP, 25 cfm, 10 psi MAX AMP Rating: N/A

Auto-Dialer: Silent Knite; Model 1410

Electrical Power: ____

Supplemental Fuel: N/A

Elect. Meter Reading: ____

Supp. Fuel Meter Reading: N/A

No. of K/O barrels at site: ____ Full / 0 Empty

PART B: SVE SYSTEM DATA

System up or down upon arrival: down start up (If down please complete PART E)

Hourmeter Reading: ____ At time: ____

I)

Flow Data	Before Adjustment	Final	Ideal Range
% Dilution air valve open	5% open	5% open	0 (closed)
% Recirculation valve open	0	0	0 (closed)
K/O Content (gal)	0	0	0
Vacuum @ blower ("H_2O) Gauge Range ____	60	60	
AMPS drawn by blower motor (AMPS)	19.5	19.5	19
Total System Flow (P, "H_2O) Pipe Size 3"	2.0	2.0	
Dilution Air Flow (P, "H_2O) Pipe Size 2 (inch) diameter	need to install pito tub Hole		0

II)

FID Data (Daily)	WC/WOC/DF	WC/WOC/DF	Ideal Range
System Influent (ppmv) (before dilution)			200
System Influent (ppmv) (after dilution)	360/10,000/0	160/4000/0	200
GAC #2 Effluent (ppmv)			NA
System Effluent (ppmv)	300/3000/0	1000/1000/0	0
Field Instrument Used: TLV		Last Calibrated:	

MAINTENANCE RECORD

Date: 11-2-94

Technician: JV

Project No.: 330 1105A

Station No.: 5387

PART 1: SVE SYSTEM

MONTHLY

	Yes	No	Action
Any leaks?		X	
Any rattles?		X	
Excessive noise?		X	
Indicator lights out?		X	
Telemetry/Autodialer working?		X	Most wells are out
Any debris?		X	
Abnormal wear and tear?		X	
Drive belt loose?		X	
Blower oil low?		X	
In line filter dirty?		X	
Abatement equipment serviced per manual?			
Other?			

QUARTERLY

	Yes	No
Blower oil changed?		
Drive belts changed?		
Linkage and bearings greased?		
System automatic shutdowns activated:		
Low flow?		
High temperature?		
Low temperature?		
K/O level switch?		
Did all above activate autodialer?		
Verified accuracy of all gauges?		
Inspected and cleaned pitot tube(s)?		

PART 2: TREATMENT COMPOUND(S)

MONTHLY

	Yes	No
Fence/gate inspected?		
Vegetation cleared?		
Leaves/debris cleared?		
Rotometer cleaned?		
Prop 65 sign posted?		
Emergency sign posted?		
Air permit posted?		
K/O containment emptied?		
Fire extinguisher on site?		
Site Safety Plan posted?		
Operation & maintenance manual on site?		

QUARTERLY

	Yes	No
Treatment compound steam-cleaned?		
Security light operation tested?		

WELL DATA SHEET

	Valve Position		FID (ppmv)			VAC/Pressure ("H_2O)		Flow		
Well ID	Initial	Final	Dilution Factor Used	WC	WOC	@ Manifold	@Well	P ("H_2O)	Pipe Size	Comments
MW-1						54	50"	~~0.6~~	2"	Well Box Full of water
MW-3 AR-1 AR-2						62	mw3-40	~~0.4~~		AR-1 Need Well Head Repair AR-2 No Sample Pt
AV-1						56	45	~~0.3~~		
AV-3						60	48	1.8		Some water Flow Reading ?
AV-4						60"	40	1.8		
AS-1						60"	40"	~~0.3~~	2"	
MAIN Fold						60		2.0	3"	
SPARGE WELLS			NA	NA	NA					
AS-1			NA	NA	NA					
AS-2			NA	NA	NA					
AS-3			NA	NA	NA					
AS-4			NA	NA	NA					
AS-5			NA	NA	NA					
AS-6			NA	NA	NA					
AS-8			NA	NA	NA					

O&M SITE VISIT PROCEDURES

1. Review request form at least 1 day before site visit so you can get clarification from the requestor. A short prefield meeting with the requestor to review non-standard requests is mandatory.

2. Be sure that all equipment necessary to perform various tasks is loaded into the truck. Test equipment for proper operation prior to leaving office.

3. Inform the requestor in advance if you do not have all necessary parts and equipment to complete the request.

4. If you are performing system monitoring be sure to complete the forms completely; **do not leave blank spaces.** Indicate "NA" if data to be collected do not apply to the site. If you are unable to collect specific data, call the requestor and get directions. NEVER LEAVE SITE WITHOUT OBTAINING NECESSARY DATA OR CALLING THE REQUESTOR FOR DIRECTIONS.

5. When collecting data, indicate data prior to system adjustment and at final setting. Unless noteworthy or requested, do not write down intermediary data.

6. Get to know systems you work on intimately. Carefully review manuals and instructions. Additionally, get to know what our remediation goals consist of so you can more effectively operate the system.

7. You are PACIFIC's eyes and ears; therefore, please indicate ANY system shortcoming or modifications that you believe will make the system operate more efficiently.

8. Develop a sense for data that you collect! If you are getting data which are unusually low or high check the gauge for accuracy and recollect the data. CALL ENGINEER FROM FIELD TO DISCUSS ABNORMAL DATA BEFORE YOU LEAVE THE SITE.

9. Avoid writing derogatory remarks on the field data sheets. Our client expects us to correct most problems during the site visit. Develop a spare parts list for each site so we can take care of minor problems during the visit.

10. If the system is experiencing problems that you cannot take care of as part of our regular O&M visit, call the Engineer. Do not spend too much time (more than 1/2 hour) before calling the Engineer for consultation. Be prepared to give the Engineer an estimate of time and material it would take to fix the problem.

11. When calling office to discuss field activities, be sure to talk to an ARCO engineering staff in person. Ask the operator to page the person you need to talk to, and call alternate Engineers on the team if necessary.

12. Check the hours allowed to complete a task prior to the field day. Resolve differences prior to field day. If additional time is needed to complete a task, call the requestor or a substitute from the field to get authorization. Be prepared to give a realistic estimate of additional time needed to complete the task from the field.

13. Please turn in all field data sheets to the sampling coordinator within 24 hours of the field visit. A field data sheet must be turned in for any field visit; even if you are driving by and stop to check the system without the request!

14. Have a camera handy so you can photograph system modifications or problems. A picture is worth a thousand words! Turn in pictures to the Engineer as soon as they are ready.

ARCO Products Company ◆ Division of AtlanticRichfieldCompany

330 110.5A **Task Order No.**

Chain of Custody

ARCO Facility no: 5387	City (Facility): Hay Ward	Project manager (Consultant): SHAW GARAMANI	Laboratory name: Sequoia
ARCO engineer: Kyle Christie	Telephone no. (ARCO):	Telephone no. (Consultant): 408 441 7500	Fax no. (Consultant): 408 441 7539
Consultant name: PACIFIC ENV GROUP	Address (Consultant): 2025 GATEWAY PL #490 SAN JOSE		Contract number:

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other (AIR)	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 SEP		1			X			11-2-94			X											
INFL		↓			↓						↓											
MID																						
EFFL																						

Condition of sample:

Temperature received:

Relinquished by sampler	Date: 11-3-94	Time: 8:10	Received by
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory / Date / Time

Special detection Limit/reporting

Special QA/QC

Remarks

Lab number

Turnaround time

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

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

APPC-3292 (2-