Reviewed on 2/22/95 ABeech

PACIFIC
ENVIRONMENTAL
GROUP, INC.

Note: SVE & Air sparging systems were inoperable this quarter. Look for some improvement next quarter.

December 30, 1994
Project 330-110.2A

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

Re: **Quarterly Report - Third 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 third quarter 1994 groundwater monitoring and performance evaluation of the soil vapor extraction (SVE) and air sparging system 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 August 17, 1994, and analyzed for the presence of total petroleum hydrocarbons calculated as gasoline (TPH-g), and 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 August 17, 1994, indicate that groundwater levels across the site have fallen an average of 1.04 feet since May 3, 1994. **Groundwater flow was to the east with an approximate gradient of 0.002.** This flow direction and gradient are consistent with historical data. Liquid surface elevation data are presented in

WEST!

Table 1. A liquid surface elevation contour map based on the data of August 17, 1994, is shown on Figure 1.

TPH-g and benzene were not detected in Wells A-6, A-8, A-9, and A-10 during the August 17, 1994 sampling event. Additionally, benzene was not detected in Well A-4. TPH-g concentrations in other site wells ranged from 62 to 14,000 parts per billion (ppb). Benzene concentrations in other site wells ranged from 1.4 to 860 ppb. Separate-phase hydrocarbons (SPH) 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 August 17, 1994. 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 in progress at the site since February 15 and March 15, 1994, respectively. PACIFIC assumed environmental consulting responsibility from GeoStrategies, Inc. (GSI) on September 1, 1994.

A brief description of the remedial system and an evaluation of its performance from June 9 through September 30, 1994 is presented below.

SVE SYSTEM

SVE 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 system, 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.

SVE System Mass Removal

During the reporting period, the SVE system did not operate; therefore no hydrocarbon mass was removed. To date, according to available data, the SVE system has removed

approximately 140.76 pounds (23.46 gallons) of TPH-g and 1.44 pounds (0.19 gallons) of benzene from impacted soil and groundwater beneath the site. Historical SVE system operational and analytical data are presented as Attachment D.

Progress toward site remediation is presented in the table below.

	Mass Removed			
	Third Quarter 1994		Cumulative	
	(lbs)	(gal)	(lbs)	(gal)
Soil Vapor Extraction				
TPH-g	0.0	0.0	140.76	23.46
Benzene	0.0	0.0	1.44	0.19

lbs = Pounds
gal = Gallons
TPH-g = Total petroleum hydrocarbons calculated as gasoline
Note: Cumulative mass removed was obtained from available data provided by the previous consultant.

SVE System Operational Data

During the reporting period, the SVE system abatement device was switched from an internal combustion engine (ICE) to GAC vessels due to low concentrations of TPH-g in the extracted vapors by GSI. Therefore the SVE system did not operate during the reporting period.

AIR SPARGING SYSTEM

Air Sparging System Description

The air sparging system is comprised of nine air sparging 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 did not operate; therefore the air sparging system was also not operated. Historical air sparging data are presented as Attachment D.

CONCLUSIONS

Groundwater elevation data for the ARCO site indicates that the groundwater flow has been towards the west since early 1992. Groundwater elevation data consistently collected during the third quarter 1994 coordinated monitoring event from all sites

(ARCO, Alliance, Shell, Texaco, and Unocal Service Stations) indicates that the regional groundwater flow direction is towards the west and is consistent with the ARCO site data. **Additionally, based on the regional groundwater flow direction being towards the west, 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, ARCO will discontinue coordinated groundwater monitoring beginning with the first quarter 1995.

Based on GSI's analysis, the SVE system abatement device was switched from ICE to GAC vessels. PACIFIC will commence startup and performance evaluation of the SVE and air sparging systems during fourth quarter.

SUMMARY OF WORK

Work Completed Third Quarter 1994

- Sampled site wells for third quarter 1994 groundwater monitoring program. Sampling was performed by IWM.
- Switched SVE system abatement device from ICE to GAC vessels.

Work Anticipated Fourth Quarter 1994

- Restart SVE and air sparging system.
- Performance evaluation and optimization of remedial system.
- Preparation and submittal of third quarter 1994 groundwater monitoring and remedial system performance evaluation report.
- Sample site wells for fourth quarter 1994 groundwater monitoring program. Sampling to be performed by IWM.
- Liaison with the BAAQMD regarding change of abatement device.
- Issue quarterly self-monitoring report to the RWQCB.

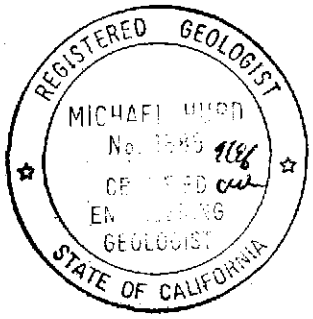
If there are any questions regarding the contents of this letter, please call.

Sincerely,

Pacific Environmental Group, Inc.

Shaw E. Garakani
Project Engineer

Michael Hurd
Senior Geologist
CEG 1885



Attachments:
- Table 1 - Liquid Surface Elevation Data
- Table 2 - Groundwater Analytical Data - Total Petroleum Hydrocarbons (TPH as Gasoline and BTEX Compounds)
- Table 3 - 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)
- Figure 1 - Liquid Surface Elevation Contour Map
- Figure 2 - TPH-g/Benzene Concentration Map
- 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 Historical Soil Vapor Extraction System Performance Data

cc: Ms. Juliet Shin, Alameda County Health Care Services Agency
Mr. Kevin Graves, Regional Water Quality Control Board
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
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
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

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
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
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

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
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
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
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

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
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

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
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
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 **
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
	02/11/93	740	2.4	<0.5	5	3.5
	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

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-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
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
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
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
	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	<50	<0.5	<0 5	<0 5	<0.5
	08/17/94	<50	<0.5	1.7	<0.5	1.4
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

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-9	02/16/94	<50	<0.5	<0.5	<0.5	<0.5
(cont.)	05/03/94	---------- Well Not Sampled ----------				
	08/17/94	<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
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
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

ppb = Parts per billion
* = 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
Texaco	MW-4B	08/17/94	36.62	——— Well Inaccessible ———			NA
Texaco	MW-4C	08/17/94	36.88	——— Well Inaccessible ———			NA
Texaco	MW-4D	08/17/94	37.50	13.23	13.23	0.00	24.27
Texaco	MW-4E	08/17/94	37.39	12.58	12.58	0.00	24.81
Texaco	MW-4F	08/17/94	35.48	11.63	11.65	0.02	23.85
Texaco	MW-4G	08/17/94	35.19	11.65	11.90	0.25	23.54
Texaco	MW-4H	08/17/94	36.04	12.27	12.35	0.08	23.77
Texaco	MW-4I	08/17/94	34.27	10.62	10.62	0.00	23.65
Texaco	MW-4J	08/17/94	36.74	12.20	12.23	0.03	24.54
Texaco	MW-4K	08/17/94	36.34	12.02	12.02	0.00	24.32
Unocal	MW-1		——— Well Destroyed ———				
Unocal	MW-2	08/17/94	37.20	12.93	12.93	0.00	24.27
Unocal	MW-3	08/17/94	37.57	13.10	13.10	0.00	24.47
Unocal	MW-4	08/17/94	36.82	12.32	12.32	0.00	24.50
Unocal	MW-5	08/17/94	37.30	12.70	12.70	0.00	24.60
Unocal	MW-6	08/17/94	38.12	13.58	13.58	0.00	24.54
Unocal	MW-7	08/17/94	36.70	12.30	12.30	0.00	24.40
Unocal	MW-8	08/17/94	38.47	13.89	13.89	0.00	24.58
Shell	S-1	08/17/94	36.56	11.53	11.53	0.00	25.03
Alliance	MW-1	08/17/94	37.13	12.34	12.34	0.00	24.79
Alliance	MW-2	08/17/94	37.88	13.03	13.03	0.00	24.85

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

Table 4

Groundwater Analytical Data - Adjacent Facilities

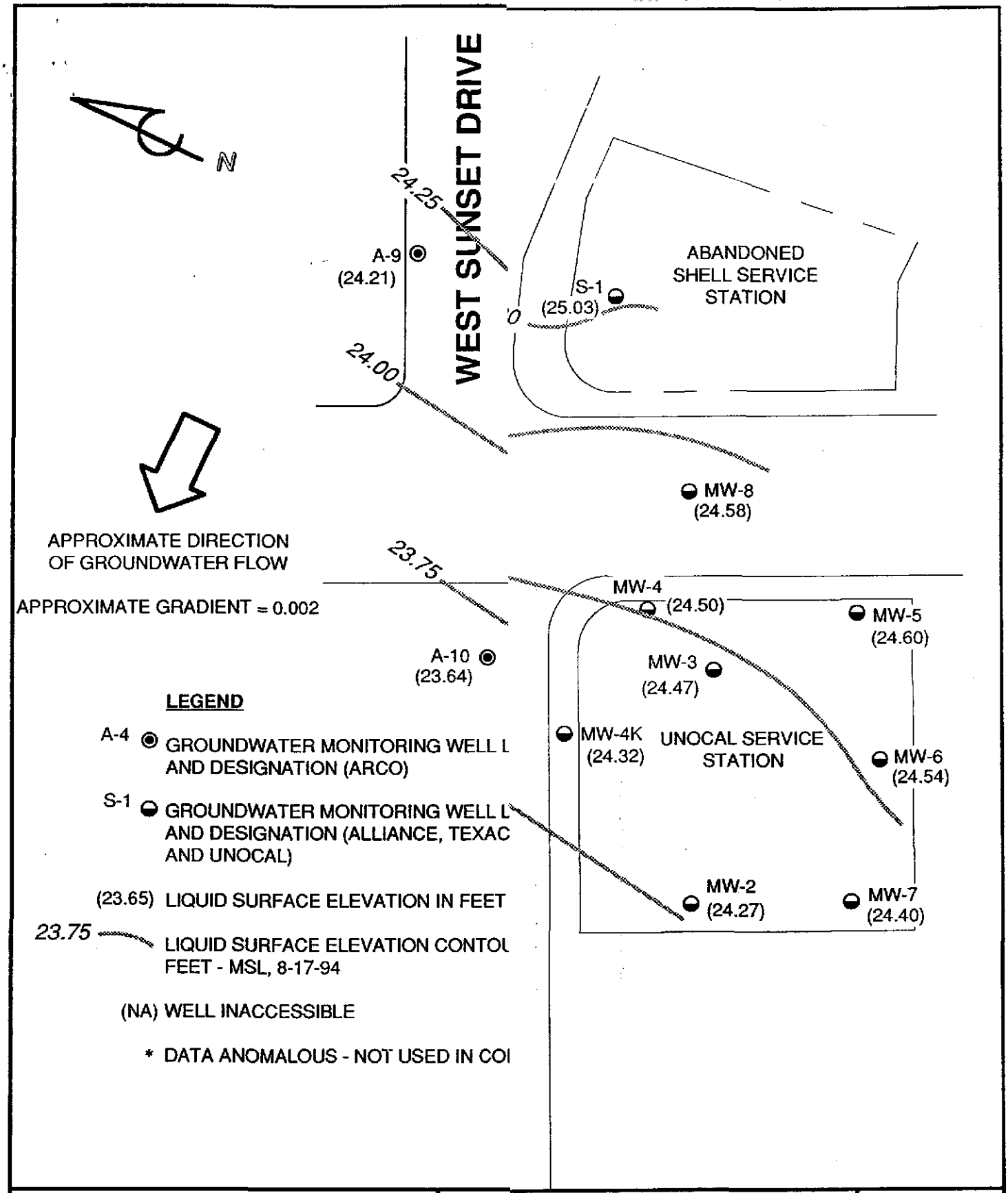
Total Petroleum Hydrocarbons

(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
Texaco	MW-4B	08/17/94	---------- Well Inaccessible ----------					
Texaco	MW-4C	08/17/94	---------- Well Inaccessible ----------					
Texaco	MW-4D	08/17/94	540	<0.5	<0.5	2.0	5.3	NA
Texaco	MW-4E	08/17/94	28,000	4,600	2,300	850	4,000	NA
Texaco	MW-4F	08/17/94	----0.02 foot of Separate-Phase Hydrocarbons----					
Texaco	MW-4G	08/17/94	----0.25 foot of Separate-Phase Hydrocarbons----					
Texaco	MW-4H	08/17/94	----0.08 foot of Separate-Phase Hydrocarbons----					
Texaco	MW-4I	08/17/94	1,000	19	19	4.7	13	NA
Texaco	MW-4J	08/17/94	----0.03 foot of Separate-Phase Hydrocarbons----					
Texaco	MW-4K	08/17/94	2,800	2.2	<0.5	2.8	4,000	NA
Unocal	MW-1	08/17/94	---------- Well Destroyed ----------					
Unocal	MW-2	08/17/94	<50	<0.5	<0.5	<0.5	<0.5	61
Unocal	MW-3	08/17/94	280	0.60	7	ND	1	110 *
Unocal	MW-4	08/17/94	5,400	22	22	7.3	9.8	1,400 *
Unocal	MW-5	08/17/94	<50	<0.5	<0.5	<0.5	<0.5	58 *
Unocal	MW-6	08/17/94	<50	<0.5	<0.5	<0.5	<0.5	<50
Unocal	MW-7	08/17/94	<50	<0.5	<0.5	<0.5	<0.5	<50
Unocal	MW-8	08/17/94	2,100	30	15	<0.5	17	1,000 *
Shell	S-1	08/17/94	< 500	< 0.3	< 0.3	< 0.3	< 0.6	NA
Alliance	MW-1	08/17/94	3,200	58	49	4.9	290	980
Alliance	MW-2	08/17/94	<50	0.7	<0.5	<0.5	0.6	< 50

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



PACIFIC
ENVIRONMENTAL
GROUP, INC.

0

FIGURE
1
PROJECT:
330-110.2A

01/30/95

N

WEST SUNSET DRIVE

A-9 ND/ND

A-6 ND/ND

ARCO SERVICE STATION

A-4 62/ND

A-5 270/1.4

MW-1 3,900/86

AR-1 3,600/630

AR-2 3,000/140

MW-2 14,000/850

MW-3 1,900/7

A-8 ND/ND

ALLIANCE SERVICE STATION

MW-1 3,200/58

MW-2 ND/0.7

MW-4J 0.03 SPH

ABANDONED SHELL SERVICE STATION

S-1 ND/ND

APPROXIMATE DIRECTION OF GROUNDWATER FLOW

A-7 350/2.2

HESPERIAN BOULEVARD

MW-8 2,100/30

WEST "A" STREET

A-10 ND/ND

MW-4E 28,000/4,600

MW-4D 540/ND

MW-4B NA

FORMER TEXACO SERVICE STATION

MW-4C NA

MW-4A 2,000/52

MW-4H 0.08 SPH

MW-4F 0.02 SPH

MW-4G 0.25 SPH

MW-4I 1,000/19

MW-4 5,400/22

MW-5 ND/ND

MW-3 280/0.6

MW-4K 2,800/2.2

UNOCAL SERVICE STATION

MW-6 ND/ND

MW-2 ND/ND

MW-7 ND/ND

LEGEND

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

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

350/2.2 TPH-g/BENZENE CONCENTRATION IN GROUNDWATER, IN PARTS PER BILLION, 8-17-94

0.02 SPH SEPARATE-PHASE HYDROCARBONS THICKNESS IN FEET, 8-17-94

* 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

03/30/95

ATTACHMENT A

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

330-110,2A

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

September 7, 1994

Barbara Sieminski
Geostrategies
6747 Sierra Court, Ste G
Dublin, CA 94568

Dear Ms. Sieminski:

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 August 17, 1994.

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

Please call us if you have any questions.

Sincerely,
Integrated Wastestream Management

Tom DeLon
Project Manager

Walter H. Howe
Registered Geologist

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

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

I NTEGRATED
W ASTESTREAM
M ANAGEMENT

A5387Q3.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	8/17/94	8/17/94	8/17/94	8/17/94	8/17/94	8/17/94	8/17/94	8/17/94	8/17/94	8/17/94	8/17/94	8/17/94	8/17/94
DEPTH TO WATER	12.92	13.86	12.78	13.69	12.38	14.95	14.18	14.34	15.40	12.34	14.03	15.08	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	3,600	3,000	3,900	14,000	1,900	62	270	ND	350	ND	ND	ND	14,000
BTEX													
BENZENE	630	140	86	850	7	ND	1.4	ND	2.2	ND	ND	ND	860
TOLUENE	<5	<5	5.1	13	<9.5#	ND	ND	ND	ND	1.7	ND	ND	14
ETHLYBENZENE	200	220	78	640	4.4	ND	7.3	ND	9.6	ND	ND	ND	650
XYLENES	12	91	9.4	270	<5#	ND	1.1	ND	3.6	1.4	ND	ND	280

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: 1000

Site Departure Time: 1415

Weather Conditions: Sunny Clear

DTW: Well Box or Well Casing (circle one)

Project No.: _____ **Location:** 20200 Hesperian Blvd. **Date:** Aug. 17, 1994

Client / Station#: Arco 5387 **Field Technician:** Vince / Cisco **Day of Week:** Wednesday

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	MATER
9	AR-1	OK	Yes	OK	None	None	34.78	12.92	12.92	N/A	N/A	N	6"	2x2 Cvd
5	AR-2	OK	Yes	OK	OK	OK	35.50	13.86	13.86	N/A	N/A	N	6"	2x2 Cvd
10	MW-1	OK	Yes	OK	OK	OK	28.80	12.78	12.78	N/A	N/A	N	2"	2x2 Cvd
12	MW-2	OK	Yes	None OK	OK	OK	27.09	13.69-	13.69-	N/A	N/A	N	2" Survey mark on casing cap	Christy
11	MW-3	OK	Yes	OK	OK	OK	28.39	12.38	12.38	N/A	N/A	N	2"	2x2 Cvd
6	A-4	OK	Yes	OK	OK	OK	35.00	14.95	14.95	N/A	N/A	N	3"	15/16
7	A-5	OK	Yes	OK	OK	OK	30.08	14.18	14.18	N/A	N/A	N	3"	15/16
4	A-6	OK	Yes	OK	OK	OK	34.94	14.34	14.34	N/A	N/A	N	3"	15/16
8	A-7	OK	Yes	OK	OK	OK	35.60	15.40	15.40	N/A	N/A	N	3"	Christy
1	A-8	OK	Yes	None OK	OK	OK	34.14	12.34+	12.34+	N/A	N/A	N	2"	Christy
3	A-9	OK	Yes	None	OK	OK	34.10	14.03	14.03	N/A	N/A	N	2" NO CURRENT SURVEY POINT TOOK DTW FROM HIGHEST POINT	Christy
2	A-10	OK	Yes	OK	OK	OK	34.30	15.08+	15.08+	N/A	N/A	N	2" NO CURRENT SURVEY POINT TOOK DTW FROM HIGHEST POINT OF CASING	15/16

PAGE 2 OF 6 DATE: 8-17-94 CLIENT/STATION #: UNO 5567 ADDRESS: 2020 Hesperian Blvd

WELL ID: MW-3 TD 28.39 DTW 12.38 x 0.17 Gal. Linear Ft. x 3 Casing Volume = 8.16 Calculated Purge

DATE PURGED: 8-17-94 START (2400 HR): 1308 END (2400 HR) 1310
DATE SAMPLED: 8-17-94 TIME (2400 HR): 1315 DTW: 12.5

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1308	1	6.80	0.99	73.6	CLEAR
1309	4	6.79	0.95	72.7	CLEAR
1310	8	6.78	0.95	72.1	CLEAR

Total purge: 8
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: AR-1 TD 34.78 DTW 12.92 x 1.5 Gal. Linear Ft. x 2 Casing Volume = 65.56 Calculated Purge

DATE PURGED: 8-17-94 START (2400 HR): 1336 END (2400 HR) 1357
DATE SAMPLED: 8-17-94 TIME (2400 HR): 1400 DTW: 65

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1337	5	6.64	1.15	73.7	CLEAR
1342	25	6.65	1.13	72.7	CLEAR
1351	45	6.71	1.08	70.9	CLEAR
1357	65	6.73	1.11	70.2	CLEAR

Total purge: 65
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

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

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

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

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

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

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

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

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

PRINT NAME: FRANCISCO ABUNGAN SIGNATURE: Francisco Abungan

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 2 OF 10 DATE: 8-17-94 CLIENT/STATION #: UNOCAL 5551 ADDRESS: 20200 Hesperian Blvd.

WELL ID: A-9 TD 34.10 DTW 14.03 X 0.17 (Gal./Linear Ft.) X 3 (Casing Volume) = 10.23 (Calculated Purge)

DATE PURGED: 8-17-94 START (2400 HR): 1205 END (2400 HR) 1207
DATE SAMPLED: 8-17-94 TIME (2400 HR): 1210 DTW: 14.1

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1206	1	7.12	0.79	74.5	CLEAR
1206	5	7.00	0.66	74.3	CLEAR
1207	10	6.99	0.68	74.1	CLEAR

Total purge: 10
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-6 TD 34.94 DTW 14.34 X 0.38 (Gal./Linear Ft.) X 3 (Casing Volume) = 23.48 (Calculated Purge)

DATE PURGED: 8-17-94 START (2400 HR): 1216 END (2400 HR) 1222
DATE SAMPLED: 8-17-94 TIME (2400 HR): 1225 DTW: 15.4

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1217	3	6.78	0.75	73.6	CLEAR
1218	10	6.81	0.74	71.8	CLEAR
1221	17	6.79	0.78	71.1	CLEAR
1222	23	6.78	0.79	70.8	CLEAR

Total purge: 23
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-4 TD 35.00 DTW 14.96 X 0.38 (Gal./Linear Ft.) X 3 (Casing Volume) = 22.85 (Calculated Purge)

DATE PURGED: 8-17-94 START (2400 HR): 1232 END (2400 HR) 1237
DATE SAMPLED: 8-17-94 TIME (2400 HR): 1242 DTW: 15

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1233	2	6.80	0.92	73.7	CLEAR
1234	10	6.78	0.92	73.3	CLEAR
1236	15	6.78	0.90	73.2	CLEAR
1237	23	6.77	0.90		CLEAR

Total purge: 23
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: MW-1 TD 28.80 DTW 12.78 X 0.17 (Gal./Linear Ft.) X 3 (Casing Volume) = 8.17 (Calculated Purge)

DATE PURGED: 8-17-94 START (2400 HR): 1254 END (2400 HR) 1255
DATE SAMPLED: 8-17-94 TIME (2400 HR): 1257 DTW: 12.8

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1254	1	7.39	0.67	73.8	CLEAR
1255	4	7.42	0.97	73.1	CLEAR
1255	8	7.40	0.96	72.7	CLEAR

Total purge: 8
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

PRINT NAME: Francisco Arungan SIGNATURE: Francisco Arungan

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

 DATE: 8-17-94 CLIENT/STATION #: Unoco 5381 ADDRESS: 20200 Hesperian Blvd.

WELL ID: A-10 TD 34.36 - DTW 14.00 X 0.17 (Gal./Linear Ft.) X 3 (Casing Volume) = 10.38 (Calculated Purge)

DATE PURGED: 8-17-94 START (2400 HR): 1140 END (2400 HR): 1148

DATE SAMPLED: 8-17-94 TIME (2400 HR): 1150 DTW: 16

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1143	2	7.18	0.81	70.9	clear
1144	5	7.12	0.79	70.5	clear
1148	10	7.11	0.78	70.2	clear

Total purge: 10

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

REMARKS:

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

DATE PURGED: START (2400 HR): END (2400 HR):

DATE SAMPLED: TIME (2400 HR): DTW:

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

Total purge:

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

REMARKS:

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

DATE PURGED: START (2400 HR): END (2400 HR):

DATE SAMPLED: TIME (2400 HR): DTW:

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

Total purge:

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

REMARKS:

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

DATE PURGED: START (2400 HR): END (2400 HR):

DATE SAMPLED: TIME (2400 HR): DTW:

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

Total purge:

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

REMARKS:

PRINT NAME: Vince Valdez SIGNATURE: Vince Valdez

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

PAGE 5 OF 6 DATE: 8-17-94 CLIENT/STATION #: Citco 5387 ADDRESS: 20200 Hesperian Blvd

WELL ID: MW-2 TD 27.09 - DTW 12.63 X 0.17 Gal. Linear Ft. X 3 Casing Volume = 7.37 Calculated Purge

DATE PURGED: 8-17-94 START (2400 HR): 1416 END (2400 HR) 1420

DATE SAMPLED: 8-17-94 TIME (2400 HR): 1423 DTW: 15.1

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1418	2	7.31	0.75	71.8	clear
1419	5	7.29	0.74	70.9	cloudy
1419	8	7.27	0.73	708	cloudy
1420	9	7.26	0.73	70.3	clear

Total purge: 9

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

REMARKS:

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

DATE PURGED: START (2400 HR): END (2400 HR)

DATE SAMPLED: TIME (2400 HR): DTW:

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

Total purge:

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

REMARKS:

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

DATE PURGED: START (2400 HR): END (2400 HR)

DATE SAMPLED: TIME (2400 HR): DTW:

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

Total purge:

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

REMARKS:

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

DATE PURGED: START (2400 HR): END (2400 HR)

DATE SAMPLED: TIME (2400 HR): DTW:

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

Total purge:

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

REMARKS:

PRINT NAME: Vince Valdes SIGNATURE: Vince Valdes

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

PAGE 6 OF 6 DATE: 8-17-94 CLIENT/STATION #: UNOCAL 5554 ADDRESS: 2020 Clay Oakland

WELL ID: A-8 TD 34.14 DTW 12.34 x 0.17 (Gal./Linear Ft.) x 3 (Casing Volume) = 11.11 (Calculated Purge)

DATE PURGED: 8-17-94 START (2400 HR): 1155 END (2400 HR) 1700
DATE SAMPLED: 8-17-94 TIME (2400 HR): 1203 DTW: 12.8

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1156	2	7.49	1.06	71.9	clear
1158	5	7.42	0.74	71.0	clear
1159	8	7.21	0.71	70.5	clear
1200	11	7.20	0.70	70.1	clear

Total purge: 11
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-5 TD 30.08 DTW 14.18 x 0.38 (Gal./Linear Ft.) x 3 (Casing Volume) = 18.12 (Calculated Purge)

DATE PURGED: 8-17-94 START (2400 HR): 1210 END (2400 HR) 1217
DATE SAMPLED: 8-17-94 TIME (2400 HR): 1220 DTW: 16.1

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1212	2	6.98	0.90	71.3	clear
1213	6	6.89	0.69	70.8	clear
1215	15	6.61	0.70	70.1	clear
1217	19	6.62	0.70	70.0	clear

Total purge: 19
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: A-7 TD 35.60 DTW 15.40 x 0.33 (Gal./Linear Ft.) x 3 (Casing Volume) = 23.02 (Calculated Purge)

DATE PURGED: 8-17-94 START (2400 HR): 1228 END (2400 HR) 1236
DATE SAMPLED: 8-17-94 TIME (2400 HR): 1239 DTW: 17

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1230	2	6.99	0.81	71.3	clear
1232	8	6.95	0.77	70.8	clear
1234	16	6.93	0.75	70.3	clear
1236	23	6.92	0.74	70.2	clear

Total purge: 23
PURGING EQUIP.: Centrifugal Pump / Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS:

WELL ID: AR-2 TD 35.50 DTW 13.36 x Ø1.5 (Gal./Linear Ft.) x 2 (Casing Volume) = 41.92 (Calculated Purge)

DATE PURGED: 8-17-94 START (2400 HR): 1345 END (2400 HR) 1408
DATE SAMPLED: 8-17-94 TIME (2400 HR): 1411 DTW: 29.0

TIME (2400 HR)	VOLUME (GAL)	pH (UNITS)	(E.C. X 1,000) (UMHOS/CM@25 C)	TEMP. (F)	COLOR (VISUAL)
1348	4	7.20	0.76	71.4	clear
1352	25	7.21	0.71	70.7	clear
1358	50	7.16	0.70	70.4	clear
1408	60	7.15	0.69	70.0	clear

Total purge: 60
PURGING EQUIP.: Centrifugal Pump Bailer Disp. SAMPLING EQUIP: Bailer Disp.
REMARKS: Pump ran out of gas at 50 gallons.

PRINT NAME: Vince Valdes SIGNATURE: Vince Valdes

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

Columbia Analytical Services, Inc.

September 1, 1994

Service Request No. S940929

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

Re: **ARCO Facility No. 5387**

Dear Ms. Austin/Mr. DeLon:

Attached are the results of the water samples submitted to our lab on August 19, 1994. For your reference, these analyses have been assigned our service request number S940929.

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

Please call if you have any questions.

Respectfully submitted:

COLUMBIA ANALYTICAL SERVICES, INC.

Keoni A. Murphy
Laboratory Manager

Annelise J. Bazar
Regional QA Coordinator

KAM/ajb

Telephone: 408/437-0400 Fax: 408/447-9356

Analytical Report

Client: IWM
Project: ARCO Facility No. 5387
Sample Matrix: Water

Service Request: S940929
Date Collected: 8/17/94
Date Received: 8/19/94
Date Extracted: NA
Date Analyzed: 8/25-29/94

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

Analyte:	TPH as Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes, Total
Units:	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)	ug/L (ppb)
Method Reporting Limit:	50	0.5	0.5	0.5	0.5
Sample Name	**Lab Code**				
AR-1 (15)	S940929-002	3,600	630	<5 *	200	12
AR-2 (28)	S940929-003	3,000	140	<5 *	220	91
MW-1 (12.8)	S940929-004	3,900	86	5.1	78	9.4
MW-2 (15.1)	S940929-005	14,000	850	13	640	270
MW-3 (12.5)	S940929-006	1,900	7.0	<9.5 **	4.4	<5 *
A-4 (15)	S940929-007	62	ND	ND	ND	ND
A-5 (16.1)	S940929-008	270	1.4	ND	7.3	1.1
A-6 (15.4)	S940929-009	ND	ND	ND	ND	ND
A-7 (17)	S940929-010	350	2.2	ND	9.6	3.6
A-8 (12.8)	S940929-011	ND	ND	1.7	ND	1.4
A-9 (14.1)	S940929-012	ND	ND	ND	ND	ND
A-10 (16)	S940929-013	ND	ND	ND	ND	ND
XDUP	S940929-014	14,000	860	14	650	280
Method Blank	S940825-WB	ND	ND	ND	ND	ND
Method Blank	S940826-WB	ND	ND	ND	ND	ND
Method Blank	S940829-WB	ND	ND	ND	ND	ND

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

Approved By: Kevin A. Murphy Date: September 1, 1994

5ABTXGAS/061694

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

Acronyms

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

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

QA/QC Report

Client: IWM
Project: ARCO Facility No. 5387
Sample Matrix: Water

Service Request: S940929
Date Collected: 8/17/94
Date Received: 8/19/94
Date Extracted: NA
Date Analyzed: 8/25-29/94

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

Sample Name	Lab Code	Percent Recovery α,α,α-Trifluorotoluene
AR-1 (15)	S940929-002	106
AR-2 (28)	S940929-003	107
MW-1 (12.8)	S940929-004	115 *
MW-2 (15.1)	S940929-005	108 *
MW-3 (12.5)	S940929-006	115
A-4 (15)	S940929-007	104
A-5 (16.1)	S940929-008	110
A-6 (15.4)	S940929-009	100
A-7 (17)	S940929-010	109
A-8 (12.8)	S940929-011	97
A-9 (14.1)	S940929-012	98
A-10 (16)	S940929-013	94
XDUP	S940929-014	112 *
MW-2 (15.1) MS	S940929-005MS	112
MW-2 (15.1) DMS	S940929-005DMS	111
Method Blank	S940825-WB	102
Method Blank	S940826-WB	106
Method Blank	S940829-WB	103

CAS Acceptance Limits: 69-116

* The surrogate used for this sample was 4-Bromofluorobenzene.

Approved By: Kevin A Murphy Date: September 1, 1994

SUR1/062994

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

QA/QC Report

Client: IWM
Project: ARCO Facility No. 5387

Service Request: S940929
Date Analyzed: 8/25/94

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

Analyte	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits
Benzene	25	27.5	110	85-115
Toluene	25	26.0	104	85-115
Ethylbenzene	25	26.1	104	85-115
Xylenes, Total	75	73.8	98	85-115
Gasoline	250	265	106	90-110

Approved By: Kevin A Murphy Date: September 1, 1994

ICV25AL/060194

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

QA/QC Report

Client: IWM
Project: ARCO Facility No. 5387
Sample Matrix: Water

Service Request: S940929
Date Collected: 8/17/94
Date Received: 8/19/94
Date Extracted: NA
Date Analyzed: 8/25/94

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

Sample Name: MW-2 (15.1)
Lab Code: S940929-005

Analyte	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Percent Recovery MS	Percent Recovery DMS	CAS Acceptance Limits	Relative Percent Difference
Benzene	1,000	1,000	854	1,950	2,000	110	115	75-135	3
Toluene	1,000	1,000	13.3	998	1,020	98	101	73-136	2
Ethylbenzene	1,000	1,000	638	1,700	1,740	106	110	69-142	2

Approved By: Kevin Murphy Date: September 1, 1994

DMS1S/060194

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

ARCO Products Company
Division of AtlanticRichfieldCompany

Task Order No. IWM-94-5CC

Chain of Custody

ARCO Facility no. A5387	City (Facility) San Lorenzo	Project manager (Consultant) Tom DeSon / B. Seimanski	Laboratory name CAS
ARCO engineer M.W.	Telephone no. (ARCO) 415/571 2431	Telephone no. (Consultant) 408/942 8955	Fax no. (Consultant) 408/942 1499
Consultant name IWM/GSI	Address (Consultant) 6747 Sierra Ct. Ste G Dublin 94568		Contract number 07077

Method of shipment: Gaylor delivery

Sample I.D.	Lab no.	Container no.	Matrix: Soil	Matrix: Water	Matrix: Other	Preservation: Ice	Preservation: Acid	Sampling date	Sampling time	BTEX 602/EPA 8020	BTEX/TPH EPA M602/8020/8015	TPH Modified 8015 Gas ☑ Diesel ☐	Oil and Grease 413.1 ☐ 413.2 ☐	TPH EPA 418.1/SM503E	EPA 601/8010	EPA 624/8240	EPA 625/8270	TCLP Metals ☐ Semi VOA ☐ VOA ☐	CAM Metals EPA 6010/7000 TTLC ☐ STLC ☐	Lead Org./DHS ☐ Lead EPA 7420/7421 ☐		
FB 1	1	2		✓		✓	✓	8-17-94	1011		✓	✓										
AR-1	2	2		✓		✓	✓		1400		✓	✓										
AR-2	3	2		✓		✓	✓		1411		✓	✓										
MW-1	4	2		✓		✓	✓		1257		✓	✓										
MW-2	5	2		✓		✓	✓		1423		✓	✓										
MW-3	6	2		✓		✓	✓		1315		✓	✓										
A-4	7	2		✓		✓	✓		1242		✓	✓										
A-5	8	2		✓		✓	✓		1220		✓	✓										
A-6	9	2		✓		✓	✓		1225		✓	✓										
A-7	10	2		✓		✓	✓		1239		✓	✓										
A-8	11	2		✓		✓	✓		1203		✓	✓										
A-9	12	2		✓		✓	✓		1210		✓	✓										
10	13	2		✓		✓	✓		1150		✓	✓										
X-DUP	14	2		✓		✓	✓		N/A		✓	✓										

Special detection Limit/reporting

Special QA/QC

Remarks: Hold on FB-1

Lab number: S940929

Turnaround time

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

Condition of sample: good		Temperature received: cool	
Relinquished by sampler: [signature]	Date 8-19-94	Time 16:10	Received by [signature] 8-19-94 16:10
Relinquished by	Date	Time	Received by
Relinquished by	Date	Time	Received by laboratory / Date / Time

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

(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.

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.

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

ATTACHMENT C

GROUNDWATER ANALYTICAL RESULTS FROM ADJACENT SITE

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	8/17/94	TOC	–	NONE	–	–	11.53	24.38

SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

CHAIN OF CUSTODY RECORD
Serial No: 940617-Z, 9408.123

Date: 6/17/94
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: Brett Bleam

Printed Name: Brett Bleam

LAB: Creekky

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 824D)	Test for Disposal	Combination TPH 8015 & BTEX 8020			Asbestos	Container Size	Preparation Used	Composite Y/N	MATERIAL DESCRIPTION	SAMPLE CONDITION/ COMMENTS
S-1	6/17/94			X		3						X							AA49061	
TB	"			X		2						X							AA49062	

CHECK ONE (1) BOX ONLY | GT/DT | TURN AROUND TIME

- Quarterly Monitoring ☒ $441 — 24 hours ☐
- Site Investigation ☐ $441 — 48 hours ☐
- Soil Closure/Disposal ☐ $442 — 15 days ☒ (Normal)
- Water Closure/Disposal ☐ $443 — Other ☐ ____
- Soil/Air Rem. or Sys. O & M ☐ $462
- Water Rem. or Sys. O & M ☐ $463
- Other ☐

NOTE: Notify Lab as soon as possible of 24/48 hr. TAT.

Relinquished By (Signature):	Printed Name: Brett Bleam	Date: 6/18/94 Time: 10:AM	Received (Signature):	Printed Name: B Capoccia — Date: 6/18/94 Time: 10:40 AM
Relinquished By (Signature):	Printed Name: B Capoccia	Date: 6/18/94 Time: 16:30	Received (Signature):	Printed Name: Greg Highfill — Date: 6/18/94 Time: 16:30
Relinquished By (Signature):	Printed Name:	Date: Time:	Received (Signature):	Printed Name: — Date: Time:

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

White Copy to Lab — Blue Copy to Consultant

CROSBY LABORATORIES INCORPORATED

5200 E. Hunter Street, Suite B Anaheim, California 92807 • 714-777-1425 • 1-800-3 CROSBY • FAX 714-777-3926

ENVIRONMENTAL • CHEMICAL • MICROBIOLOGICAL • TESTING SERVICES

Analytical Report

COVER SHEET

LAB RECEIVING #: 9408.123

REPORT DATE: 08/30/94

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

WIC #: 204-3336-1704
PROJECT #: NONE
PROJECT NAME: SHELL-20500 HESPERIAN BLVD., HAYWARD

DATE SAMPLED: 08/17/94
DATE RECEIVED: 08/18/94
 # OF SAMPLES: 2

SAMPLE MATRIX: LIQUID

SAMPLE ID: S-1
TB

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 #: 0389.01
Expiration Date: 9/30/94

CROSBY LABORATORIES INCORPORATED

5200 E. Hunter Street, Suite B Anaheim, California 92807 • 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#: 9408.123

WIC #: 204-3336-1704

PROJECT #: NONE

PROJECT NAME: SHELL-20500 HESPERIAN BLVD., HAYWARD

Spl. Prep. Meth.: EPA 5030

MATRIX: LIQUID

UNIT: µg/l

Prepared: 08/26/94

Analyzed: 08/26/94

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 (80-120)	TPH (80-120)
RA082694	METHOD BLANK	1	ND	ND	ND	ND	ND	103	99
AA49061	S-1	1	ND	ND	ND	ND	ND	96	96
AA49062	TB	1	ND	ND	ND	ND	ND	93	89
DETECTION LIMITS			0.3	0.3	0.3	0.6	500		

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

MATRIX SPIKE/ MATRIX SPIKE DUPLICATE	ACCURACY SPK CONC. (µg/l)	MS (µg/l)	% MS	MSD (µg/l)	% MSD	ACP % MS	PRECISION RPD	ACP % RPD
Benzene	8.0	13.0	103	12.8	100	80-120	1	0-25
Toluene	8.0	12.0	95	12.1	96	80-120	0	0-25
Ethyl Benzene	8.0	9.8	90	9.8	90	80-120	0	0-25

AUDIT DATA	LAB ID	SAMPLE ID	BATCH #	QC STD #	ANALYZED
	AA48814	MW-4	BT082694	GC132	08/26/94

NOTES:

ND denotes Not Detected at the Indicated detection limit.

WELL GAUGING DATA

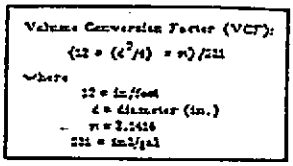
Project # 940817-Z1 Date 8/17/94 Client Shell wic# 204 3336 1704

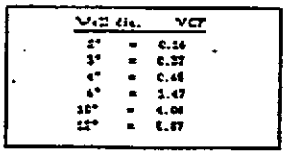
Site 20500 Hesperian Blvd. Hayward CA

Well I.D.	Well Size (in.)	Sheen/ Odor	Depth to Immiscible Liquid (feet)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to Water (feet)	Depth to Well Bottom (feet)	Survey Point: TOB or TOC
S-1	4					11.53	24.38	TOC

SHELL WELL MONITORING DATA SHEET

Project #: 940817-Z1	**Wic #** 204 3336 1704
Sampler: BB	**Date Sampled:** 8/17/94
Well I.D.: S-1	**Well Diameter:** (circle one) 2 3 (4) 6 ____
Total Well Depth: Before 24.38 After	**Depth to Water:** Before 11.53 After
Depth to Free Product:	**Thickness of Free Product (feet):**
Measurements referenced to: (PVC) Grade Other --	





8.3	x	3	=	24.9
1 Case Volume		Specified Volumes		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:
953	77.8	7.5	900	14.8	9	
955	76.0	7.5	850	135.9	18	
956	75.8	7.5	830	84.3	25	

Did Well Dewater? No **If yes, gals.** **Gallons Actually Evacuated:** 25

Sampling Time: 1005

Sample I.D.: S-1 **Laboratory:** Crosby

Analyzed for: TPH-G, 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: 8/17/94

Site address 20500 Hesperian Blvd. Inspected by: BB

Hayward, CA BTS Event # 940817-Z1

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.

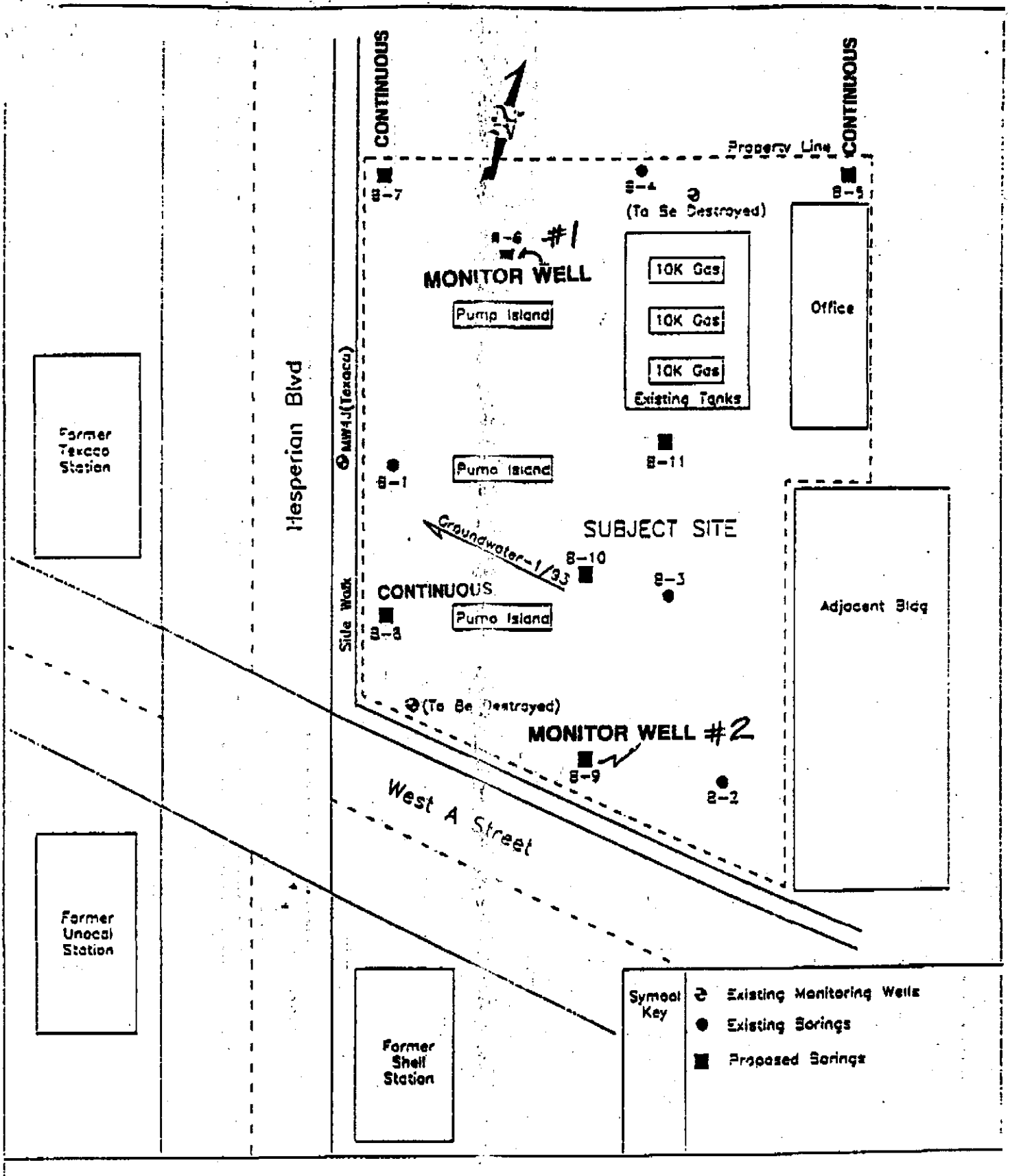
Well I.D.	Deficiency	Corrective Action Taken

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 _____



CERTIFIED ENVIRONMENTAL CONSULTING

536 STONE ROAD SUITE J, BENICIA, CA 94510
(707) 745-0171 / (800) 339-0171 / (707) 745-0163 FAX

Figure 3
Proposed Boring Locations
20450 Hesperian Blvd
Hayward, CA
Project No. 94-510-144C

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: Airport Alliance	Date Sampled: 08/17/94
		Date Received: 08/17/94
	Client Contact: Rafael Gallardo	Date Extracted: 08/18-08/19/94
	Client P.O.	Date Analyzed: 08/18-08/19/94

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
40373	MW-1	W	3200,b,c	58	49	4.9	290	92
40374	MW-2	W	ND,d	0.007	ND	ND	0.006	93
40375	F-B	W	ND	ND	ND	ND	ND	92
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: Airport Alliance	Date Sampled: 08/17/94
		Date Received: 08/17/94
	Client Contact: Rafael Gallardo	Date Extracted: 08/19/94
	Client P.O:	Date Analyzed: 08/19/94

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
40373	MW-1	W	980.x	107
40374	MW-2	W	ND	107
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(cL) or heavy(cH) 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

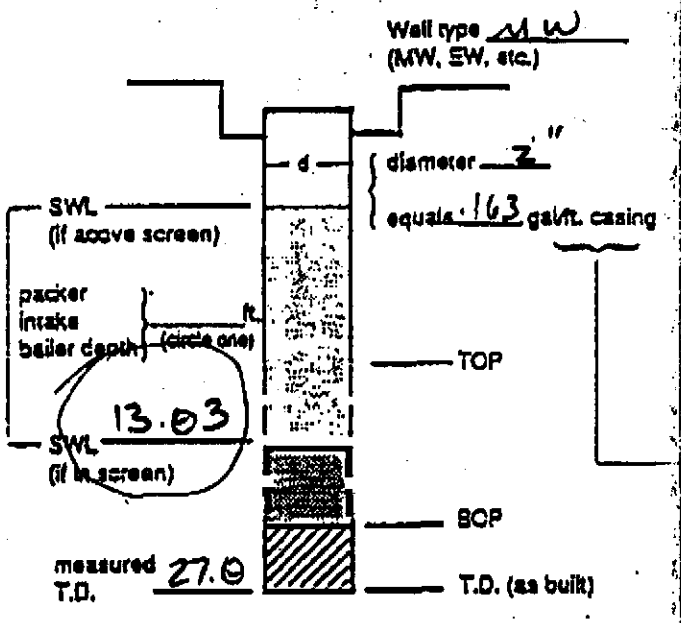
Edward Hamilton, Lab Director

(fill out completely)

WELL OR LOCATION MW-2 / 13.9

PROJECT Airport A1 EVENT Quarterly SAMPLER T. PEW DATE 8.12.94

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	12:28		
Stop	12:47		
Sampled	2:10		
Final IWL	2.02		

Purge calculation

.163 gal/ft. • 13.97 ft. = 2.3 gals x 3 = 6.9 gals.

SWL to SOP or packer to SOP | 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:

Actual gallons purged

Actual volumes purged

Well yield (see below) ⊕

COC #

Sample I.D.	Analysis	Lab
MW-2	TPH-D	McCampbell
	TPH-G	
	BTEX	

Additional comments:

Hand Bailed

Gallons purged *	TEMP °C / (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1	72					
2. 2.3	72.2	1137	5.20			
3. 4.6	73.8	1151	11.67			
4. 6.9	74.2	1152	4.37			
5.						

* Take measurement at approximately each casing volume purged.

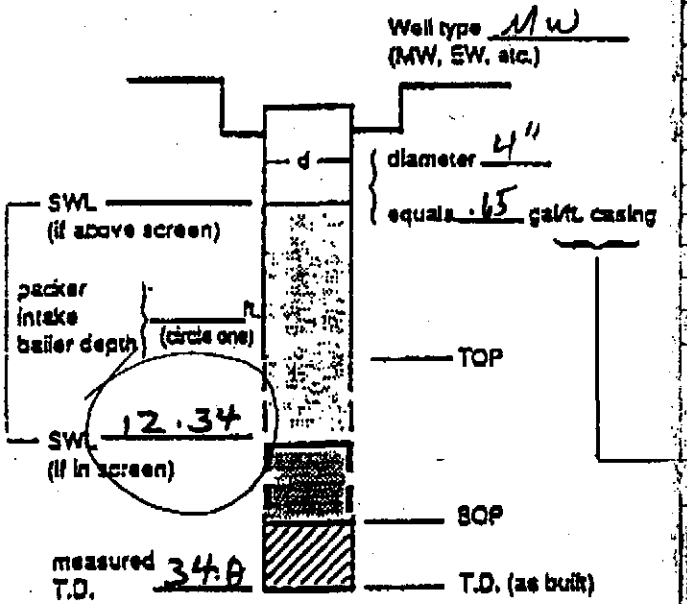
⊕ HY- Minimal W.L drop | MY - WL drop - able to purge 3 volumes during one sitting by reducing pump rate or cycling pump. | LY - Able to purge 3 volumes by returning later or next day. | VLY - Minimal recharge - unable to purge 3 volumes.

(fill out completely)

WELL OR LOCATION MW-1/B-6

PROJECT Diesel + Oil EVENT Quarterly SAMPLER T. PEW DATE 8.17.94

Well / Hydrologic statistics



Action	Time	Pump rate	IWL (low yield)
Start pump / Begin	10:51		
Stop	11:48		
Sampled			
(Final IWL)			

Purge calculation

.65 gal/ft. • 21.66 ft. = 14.08 gals x 3 = 42.24 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:

Actual gallons purged 28

Actual volumes purged 2

Well yield ⊕ (see below) VLY

COC #

Sample I.D.	Analysis	Lab
MW-1	TPH-D	McCampbell
	TPH-G	
	Btex	

Additional comments:

MJ — 12.23

Gallons purged *	TEMP °C (F) (circle one)	EC (µs / cm)	PH	TURBIDITY (NTU)		
1. 1	79.0	1143	7.66			
2. 7	71.4	1210	6.15			
3. 14	70.1	1185	5.56			
4.	73.6	1193	5.47			
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.

801 Western Avenue
Glendale, CA 91201
818/247-5737
Fax: 818/247-9797

LOC NO: G94-08-248

Received: 19 AUG 94

Mailed: 8/19/94

Ms. Rebecca Digerness
Texaco Environmental Services
108 Cutting Boulevard
Richmond, CA 94804

Purchase Order: 94-1446346+4370

Requisition: 624880148
Project: FKEP1011L

REPORT OF ANALYTICAL RESULTS

AQUEOUS

SAMPLE DESCRIPTION	DATE SAMPLED	TPH/BTEX (CADHS/8020) Date Analyzed Date	Dilution Factor Times 1	TPH-g ug/L	Benzene ug/L	Toluene ug/L	Ethyl-Benzene ug/L	Total Xylenes Isomers ug/L
RDL			1	50	0.5	0.5	0.5	0.5
1*MW-4D	08/17/94	08/31/94	1	540	<0.5	<0.5	2.0	5.3
2*MW-4I	08/17/94	08/31/94	1	1000	19	19	4.7	13
3*MW-4A	08/17/94	08/31/94	5	2000	52	6.4	120	12
4*MW-4K	08/17/94	08/31/94	1	2800	2.2	<0.5	2.8	7.6
5*MW-4E	08/17/94	08/31/94	50	28000	4600	2300	850	4000
6*EB	08/17/94	08/31/94	1	<50	<0.5	<0.5	<0.5	<0.5
7*TB	08/17/94	08/31/94	1	<50	<0.5	<0.5	<0.5	<0.5

Karen Petryna
20499 Hesperian Rd., Hayward
Alameda County

James C. Hein, Laboratory Director

BCA

B C Analytical

9ER PLACED FOR CLIENT: Texaco Environmental Services 9408248 :
ANALYTICAL : GLEN LAB : 09:30:27 02 SEP 1994 - P. 1 :

LES...	SAMPLE DESCRIPTION..	DETERM.....	DATE..... ANALYZED	METHOD.....	EQUIP.	BATCH..	ID.NO
248*1	MW-4D	GAS.BTX.TESNC	08.31.94	8015M.TX			
248*2	MW-4I	GAS.BTX.TESNC	08.31.94	8015M.TX			
248*3	MW-4A	GAS.BTX.TESNC	08.31.94	8015M.TX			
248*4	MW-4K	GAS.BTX.TESNC	08.31.94	8015M.TX			
248*5	MW-4E	GAS.BTX.TESNC	08.31.94	8015M.TX			
248*6	EB	GAS.BTX.TESNC	08.31.94	8015M.TX			
248*7	TB	GAS.BTX.TESNC	08.31.94	8015M.TX			

Notes: Equipment = BC Analytical identification number for a particular piece of analytical equipment.

ID.NO = BC Analytical employee identification number of analyst.

LES...	SAMPLE DESCRIPTION..	DETERM.....	DATE.... ANALYZED	METHOD.....	EQUIP.	BATCH..	ID.NO
3296*1	G9408248*1	GAS.BTX.TESNC	08.31.94	8015M.TX		94189	8559
3296*2	G9408248*2	GAS.BTX.TESNC	08.31.94	8015M.TX		94189	8559
3296*3	G9408248*3	GAS.BTX.TESNC	08.31.94	8015M.TX		94189	8559
3296*4	G9408248*4	GAS.BTX.TESNC	08.31.94	8015M.TX		94189	8559
3296*5	G9408248*5	GAS.BTX.TESNC	08.31.94	8015M.TX		943165	8559
3296*6	G9408248*6	GAS.BTX.TESNC	08.31.94	8015M.TX		94189	8559
3296*7	G9408248*7	GAS.BTX.TESNC	08.31.94	8015M.TX		943165	8559

Notes: Equipment = BC Analytical identification number for a particular piece of analytical equipment.

ID.NO = BC Analytical employee identification number of analyst.

ORDER QC REPORT: Definitions and Terms

Accuracy	The ability of a procedure to determine the "true" concentration of an analyte.
Precision	The reproducibility of a procedure demonstrated by the agreement between analyses performed on either duplicates of the same sample or a pair of duplicate spikes.
Batch	A group of twenty samples or less, of similar matrix type, prepped together or analyzed together if no sample preparation is required, under the same conditions and with the same reagents. The batch must include a method blank, LCS and matrix QC.
Laboratory Control Standard (LCS)	A blank that is spiked with a known amount of analyte and subjected to the same procedures as the samples. The LCS indicates the accuracy of the analytical method. It also serves to double-check the calibration because it is prepared from a different source than the standard used to calibrate the instrument.
Matrix QC	Quality control performed on actual client samples. The matrix spike is a client's sample spiked with a known amount of analyte. For most analyses, the laboratory performs matrix spikes in duplicate (duplicate spikes).
Method Blank	A sample that contains no analyte. For water analysis, organic-free or deionized water is used. For solids analysis, analyte-free solvent is used. The method blank serves to measure contamination associated with laboratory storage, preparation or instrumentation.
Batch Number	Numeric designation for a batch of samples and the associated QC. The batch number sequence is unique for each determination.
LC Result	Laboratory result of an LCS analysis.
LT Result	Expected result, or true value, of the LCS analysis.
Percent Recovery	The percentage of analyte recovered. For LCS, the percent recovery calculation is: $LC/LT \times 100$
LC1, LC2 Result	Result of analyzing two separately prepared LCSs; used to determine precision.
R1, R2 Result	Result of analyzing replicate aliquots of a sample, with R1 indicating the first analysis of the sample and R2 its corresponding duplicate; used to determine precision.
S1, S2 Result	Result of the analysis of replicate spiked aliquots, with S1 indicating one spike of the sample and S2 the second spike; used to determine precision and accuracy.
Relative Percent Difference (RPD)	Calculated using one of the following: $\frac{\lvert LC1 - LC2\rvert \times 100}{(LC1 + LC2) \div 2}$ $\frac{\lvert R1 - R2\rvert \times 100}{(R1 + R2) \div 2}$ $\frac{\lvert S1 - S2\rvert \times 100}{(S1 + S2) \div 2}$
S1, S2 Recovery	The percentage of analyte recovered. The percent recovery calculation is: S1 Recovery: $\frac{(S1 - R1)}{(True - R1)} \times 100$ S2 Recovery: $\frac{(S2 - R1)}{(True - R1)} \times 100$
True Value	The theoretical, or expected, result of a spike sample analysis.
NC Flag	Indicates that the spike recovery was not calculated due to high sample concentration relative to the amount of spike added.
Q Flag	Indicates that the quality control measurement is outside the specified control limits.
Blank Result	Laboratory result of analysis of the method blank.
Reporting Detection Limit (RDL)	BCA–assigned limit based on, but not the same as, method detection limits (MDLs) determined using EPA guidelines. Sample RDLs may differ from the blank RDL if the samples were diluted.

BC ANALYTICAL

ORDER QC REPORT FOR A9408296

E REPORTED : 09/02/94

LABORATORY CONTROL STANDARDS
FOR BATCHES WHICH INCLUDE THIS ORDER

AMETER	DATE ANALYZED	BATCH NUMBER	LC RESULT	LT RESULT	UNIT	PERCENT RECOVERY
TPH-gas/BTEX (CADHS/80 C409021*1						
)ate Analyzed	09.01.94	94189	09/01/94	09/01/94	Date	N/A
Benzene	09.01.94	94189	16.2	16.6	ug/L	98
Toluene	09.01.94	94189	71.0	82.0	ug/L	87
Ethylbenzene	09.01.94	94189	15.5	18.3	ug/L	85
Total Xylene Isomers	09.01.94	94189	95.7	93.4	ug/L	102
TPH-Volatile Hydrocarbons	09.01.94	94189	923	1000	ug/L	92
a,a,a-Trifluorotoluene Reported	09.01.94	94189	45.1	50.0	ug/L	90
a,a,a-Trifluorotoluene Theoretic	09.01.94	94189	50.0	50.0	ug/L	100
TPH-gas/BTEX (CADHS/80 C409019*1						
)ate Analyzed	08.31.94	943165	08/31/94	08/31/94	Date	N/A
Benzene	08.31.94	943165	12.7	16.6	ug/L	77
Toluene	08.31.94	943165	91.2	82.0	ug/L	111
Ethylbenzene	08.31.94	943165	19.4	18.3	ug/L	106
Total Xylene Isomers	08.31.94	943165	109	93.4	ug/L	117
TPH-Volatile Hydrocarbons	08.31.94	943165	900	1000	ug/L	90
a,a,a-Trifluorotoluene Reported	08.31.94	943165	51.9	50.0	ug/L	104
a,a,a-Trifluorotoluene Theoretic	08.31.94	943165	50.0	50.0	ug/L	100

BC ANALYTICAL

ORDER QC REPORT FOR A9408296

REPORTED : 09/02/94

MATRIX QC PRECISION (DUPLICATE SPIKES)
BATCH QC REPORT

AMETER	SAMPLE NUMBER	DATE ANALYZED	BATCH NUMBER	MS RESULT	MSD RESULT	UNIT	RELATIVE % DIFF
TPH-gas/BTEX (CADHS/80	9408296*6						
ate Analyzed		08.31.94	94189	08/31/94	08/31/94	Date	N/A
enzene		08.31.94	94189	16.5	16.2	ug/L	2
oluene		08.31.94	94189	74.3	69.7	ug/L	6
thylbenzene		08.31.94	94189	17.0	16.2	ug/L	5
otal Xylene Isomers		08.31.94	94189	105	98.4	ug/L	6
PH-Volatile Hydrocarbons		08.31.94	94189	1220	1110	ug/L	9
,a,a-Trifluorotoluene Reported		08.31.94	94189	48.6	48.4	ug/L	0
,a,a-Trifluorotoluene Theoretic		08.31.94	94189	50.0	50.0	ug/L	0
TPH-gas/BTEX (CADHS/80	9408300*4						
ate Analyzed		08.31.94	943165	08/31/94	08/31/94	Date	N/A
enzene		08.31.94	943165	12.8	12.5	ug/L	2
oluene		08.31.94	943165	87.0	85.0	ug/L	2
thylbenzene		08.31.94	943165	17.8	17.4	ug/L	2
otal Xylene Isomers		08.31.94	943165	110	108	ug/L	2
PH-Volatile Hydrocarbons		08.31.94	943165	930	1050	ug/L	12
,a,a-Trifluorotoluene Reported		08.31.94	943165	55.3	54.8	ug/L	1
,a,a-Trifluorotoluene Theoretic		08.31.94	943165	50.0	50.0	ug/L	0

BC ANALYTICAL

ORDER QC REPORT FOR A9408296

E REPORTED : 09/02/94

MATRIX QC ACCURACY (SPIKES)
BATCH QC REPORT

RAMETER	SAMPLE NUMBER	DATE ANALYZED	BATCH NUMBER	MS %	MSD %	TRUE RESULT	UNIT	
TPH-gas/BTEX (CADHS/80 9408296*6								
Benzene		08.31.94	94189	99	98	16.6	ug/L	
Toluene		08.31.94	94189	91	85	82.0	ug/L	
Ethylbenzene		08.31.94	94189	93	89	18.3	ug/L	
Total Xylene Isomers		08.31.94	94189	112	105	93.4	ug/L	
TPH-Volatile Hydrocarbons		08.31.94	94189	122	111	1000	ug/L	
a,a,a-Trifluorotoluene Reported		08.31.94	94189	NC	NC	50.0	ug/L	NC
a,a,a-Trifluorotoluene Theoretic		08.31.94	94189	NC	NC	50.0	ug/L	NC
TPH-gas/BTEX (CADHS/80 9408300*4								
Benzene		08.31.94	943165	77	75	16.6	ug/L	
Toluene		08.31.94	943165	106	104	82.0	ug/L	
Ethylbenzene		08.31.94	943165	97	95	18.3	ug/L	
Total Xylene Isomers		08.31.94	943165	118	116	93.4	ug/L	
TPH-Volatile Hydrocarbons		08.31.94	943165	93	105	1000	ug/L	
a,a,a-Trifluorotoluene Reported		08.31.94	943165	NC	NC	50.0	ug/L	NC
a,a,a-Trifluorotoluene Theoretic		08.31.94	943165	NC	NC	50.0	ug/L	NC

BC ANALYTICAL

ORDER QC REPORT FOR A9408296

REPORTED : 09/02/94

METHOD BLANKS AND REPORTING DETECTION LIMIT (RDL)
FOR BATCHES WHICH INCLUDE THIS ORDER

AMETER	DATE ANALYZED	BATCH NUMBER	BLANK RESULT	RDL	UNIT	METHOD
TPH-gas/BTEX (CADHS/80 B409011*1						
ate Analyzed	08.31.94	94189	08/31/94	NA	Date	8015M.TX
enzene	08.31.94	94189	0	0.5	ug/L	8015M.TX
oluene	08.31.94	94189	0	0.5	ug/L	8015M.TX
thylbenzene	08.31.94	94189	0	0.5	ug/L	8015M.TX
otal Xylene Isomers	08.31.94	94189	1.0	0.5	ug/L	8015M.TX
PH-Volatile Hydrocarbons	08.31.94	94189	0	50	ug/L	8015M.TX
TPH-gas/BTEX (CADHS/80 B409009*1						
ate Analyzed	08.31.94	943165	08/31/94	NA	Date	8015M.TX
enzene	08.31.94	943165	0	0.5	ug/L	8015M.TX
oluene	08.31.94	943165	0	0.5	ug/L	8015M.TX
thylbenzene	08.31.94	943165	0	0.5	ug/L	8015M.TX
otal Xylene Isomers	08.31.94	943165	0	0.5	ug/L	8015M.TX
PH-Volatile Hydrocarbons	08.31.94	943165	0	50	ug/L	8015M.TX

HOD ANALYTE	BATCH	ANALYZED	REPORTED	TRUE	%REC	FLAG
3296*1						
5M.TXa,a,a-Trifluorotoluene	94189	08/31/94	45.5	50.0	91	
3296*2						
5M.TXa,a,a-Trifluorotoluene	94189	08/31/94	54.9	50.0	110	
8296*3						
5M.TXa,a,a-Trifluorotoluene	94189	08/31/94	41.6	50.0	83	
8296*4						
5M.TXa,a,a-Trifluorotoluene	94189	08/31/94	40.7	50.0	81	
8296*5						
5M.TXa,a,a-Trifluorotoluene	943165	08/31/94	52.6	50.0	105	
8296*6						
5M.TXa,a,a-Trifluorotoluene	94189	08/31/94	48.9	50.0	98	
8296*7						
5M.TXa,a,a-Trifluorotoluene	943165	08/31/94	54.9	50.0	110	

SURROGATE RECOVERIES :
3C ANALYTICAL : ANHM LAB : 09:22:55 02 SEP 1994 - P. 1 :

THOD ANALYTE	BATCH	ANALYZED	REPORTED	TRUE	%REC	FLAG
)8296*6*R1						
15M.TXa,a,a-Trifluorotoluene	94189	08/31/94	48.9	50.0	98	
)8296*6*S1						
15M.TXa,a,a-Trifluorotoluene	94189	08/31/94	48.6	50.0	97	NC
08296*6*S2						
15M.TXa,a,a-Trifluorotoluene	94189	08/31/94	48.4	50.0	97	NC
08296*6*T						
15M.TXa,a,a-Trifluorotoluene	94189	08/31/94	50.0	50.0	100	
)8300*4*R1						
15M.TXa,a,a-Trifluorotoluene	943165	08/31/94	57.8	50.0	116	
08300*4*S1						
15M.TXa,a,a-Trifluorotoluene	943165	08/31/94	55.3	50.0	111	NC
)8300*4*S2						
15M.TXa,a,a-Trifluorotoluene	943165	08/31/94	54.8	50.0	110	NC
)8300*4*T						
15M.TXa,a,a-Trifluorotoluene	943165	08/31/94	50.0	50.0	100	

Well Gauging Data

Project Name: 624 880 148
Project Number: 940817-2L

Date: 8/17/94
Recorded By: BB

Well ID	TOC Elev.	DTB (ft. TOC)	Well Dia. (in.)	DTP (ft.)	DTW (ft.)	PT (ft.)	Comments
mw-4A		19.76	2		11.64		odor
mw-4B		INACCESSIBLE (PILE OF DIRT ON			WELL)		
mw-4C		INACCESSIBLE (PILE OF DIRT ON			WELL)		
mw-4D		19.84	4		13.23		odor
mw-4E		19.50	4		12.58		odor
mw-4F		–	4	11.63	11.65	.02	
mw-4G		–	4	11.63	11.90	.25	
mw-4H		–	4	12.27	12.35	.08	
mw-4I		18.54	4		10.62		odor
mw-4J			2	12.20	12.23	.03	
mw-4K		19.74	2		12.02		odor

TOC = Top of casing
DTB = Depth to bottom in feet below TOC
DTP = Depth to product in feet below TOC
DTW = Depth to water in feet below TOC
PT = Product thickness in feet

6140E 248-

Chain-of-Custody

Page 1 of 1

Texaco Environmental Services
108 Cutting Boulevard
Richmond, California 94804
Phone: (510) 236-3541
FAX: (510) 237-7821

Forward Results to the Attention of Rebecca Digerness
Texaco Project Corordinator: Karen Petryna

Site Name: Texaco 624 880148
Site Address: 20499 Hesperian Blvd. Hayward
Contractor Project Number: 940817-B2
Contractor Name: Blaine Tech Services
Address: 985 Timothy Dr. San Jose
Project Contact: Jim Keller Dan Weitz
Phone/FAX: (408) 995-5535 (408) 293-8773

Laboratory: B C Analytical
Turn Around Time:
Samplers (PRINT NAME): Brett Blean
Sampler Signature:
Date Samples Collected: 8/17/94

624 880148
Alameda City
KEP
EKEP 1011

Sample Number	Lab Sample Number	Date/Time Collected	No. of Containers	Type of Containers	Sample Matrix	Preservative	TPH gas/BTEX	TPH Diesel	O&G/TRPH (418.1)	TPH Ex. (C8-C36+)	VOCs 8240/624	P. Halocarbons 8010/60	P. Aromatics 8020/602	Organic Lead			Comments
MW-4D		8/17/94 / 1200	3	VOA		HCL	x	–	1								
MW-4I		" / 1225	3	"		"	x	–	2								
MW-4A		" / 1245	3	"		"	x	–	3								
MW-4K		" / 1305	3	"		"	x	–	4								
MW-4E		" / 1350	3	"		"	x	–	5								
EB		" / 1205	3	"		"	x	–	6								
TB		" –	2	"		"	x	–	7								

Relinquished by: (Signature)	Date: 8/19/94	Time: 1440	Received by: (Signature) Bill Kgoro
Relinquished by: (Signature) Bill Kgoro	Date: 8-19-94	Time: 5:15	Received by: (Signature) Jan Winkler
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)
Method of Shipment:			Lab Comments:

Date: 8-19-94 Time: 1440
Date: 8/19/94 Time:
Date: Time:

Groundwater Sampling Form

Project Name 624 Sequoia Project Number 94081-22 Recorded By BB

Well No. MW-4A Well Type [✓] Monitor [ ] Extraction [ ] Other

Sampled by BB Date 8/17/94

WELL PURGING

PURGE VOLUME

Well casing diameter

[✓] 2-inch [ ] 4-inch [ ] Other

Well Total Depth (TD, ft. below TOC) 19.76

Depth to Water (WL, ft. below TOC) 11.64

Depth to free phase hydrocarbons (FP, ft. below TOC)

Number of well volumes to be purged

[ ] 3 [ ] 10 [ ] Other

PURGE VOLUME CALCULATION

8.12 (Water Column Length) X .17 (Multiplier) X 1.4 (No. Vols) = 4.2 gals CALCULATED PURGE VOLUME

MULTIPLIER (Casing Dia. [inches] = Gallons/linear ft)
2 = 0.17 | 3 = 0.38 | 4 = 0.66 | 4.5 = 0.83 | 5 = 1.02 | 6 = 1.5 | 8 = 2.6

5.0 gals ACTUAL PURGE VOLUME

PURGE METHOD

[ ] Bailer - Type

[✓] Pump - Type Electric

[ ] Other

PUMP INTAKE

[ ] Near top Depth (ft)

[✓] Near Bottom Depth (ft)

[ ] Other

Pumping Rate 2.0 gpm

GROUNDWATER PARAMETER MEASUREMENT

Meter Type

Time/Gallons	pH	Cond. (uomhos/cm)	Temp	[ ] deg C [x] deg F	Turbidity (NTU)	Color/Odor
1236 / 2.0	7.2	680	75.6		185.9	odor
1237 / 4.0	7.2	610	74.6		144.6	"
1238 / 5.0	7.2	610	74.2		84.3	"
/						
/						
/						
/						
/						

Comments during well purge

Well Pumped dry: YES (NO)

Purge water storage/disposal [ ] Drummed onsite [x] Other BTS

WELL SAMPLING

SAMPLING METHOD

Date/Time Sampled 8/17/94 / 1245

Bailer - Type [ ] 3SB

Sample port [ ] Other [ ]

GROUNDWATER SAMPLE PARAMETER MEASUREMENTS

Meter Type Myron LpDs

Date/Time/% Recharge	pH	Cond. (uomhos/cm)	Temp	[ ] deg C [ ] deg F	Turbidity (NTU)	Color/Odor
/ /						

SAMPLING PROGRAM

Sample No.	Container #/Volume	Analysis	Preservatives	Laboratory	Comments
MW-4A	3 / 40 ml VOA	TPH-G, BTEX	HCL	BC. A	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.
Trip	
Rinsate	
Transfer	
Other:	

Groundwater Sampling Form

Project Name 624 880 48 Well No. MW-48

Project Number 440817-22 Well Type [X] Monitor [ ] Extraction [ ] Other

Recorded By BB Sampled by – Date 8/17/94

WELL PURGING

PURGE VOLUME

Well casing diameter

[ ] 2-inch [ ] 4-inch [ ] Other

Well Total Depth (TD, ft. below TOC)

Depth to Water (WL, ft. below TOC)

Depth to free phase hydrocarbons (FP, ft. below TOC)

Number of well volumes to be purged

[ ] 3 [ ] 10 [ ] Other

PURGE METHOD

[ ] Bailer - Type

[ ] Pump - Type

[ ] Other

PUMP INTAKE

[ ] Near top Depth (ft)

[ ] Near Bottom Depth (ft)

[ ] Other

Pumping Rate gpm

PURGE VOLUME CALCULATION

Water Column Length X Multiplier X No. Vols = gals CALCULATED PURGE VOLUME

gals ACTUAL PURGE VOLUME

MULTIPLIER (Casing Dia.[inches] = Gallons/linear ft)

2 = 0.17 | 3 = 0.38 | 4 = 0.66 | 4.5 = 0.83 | 5 = 1.02 | 6 = 1.5 | 8 = 2.6

GROUNDWATER PARAMETER MEASUREMENT

Meter Type

Time/Gallons	pH	Cond. (uomhos/cm)	Temp	[ ] deg C [ ] deg F	Turbidity (NTU)	Color/Odor
/						
/						
/						
/ NOT SAMPLED	WELL INACCESSIBLE (DIRT OVER WELL)					
/						
/						
/						
/						

Comments during well purge

Well Pumped dry: YES NO

Purge water storage/disposal [ ] Drummed onsite [ ] Other

WELL SAMPLING

SAMPLING METHOD

Date/Time Sampled /

Bailer - Type [ ]

Sample port [ ] Other [ ]

GROUNDWATER SAMPLE PARAMETER MEASUREMENTS

Meter Type

Date/Time/% Recharge	pH	Cond. (uomhos/cm)	Temp	[ ] deg C [ ] deg F	Turbidity (NTU)	Color/Odor
/ /						

SAMPLING PROGRAM

Sample No.	Container #/Volume	Analysis	Preservatives	Laboratory	Comments

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.
Trip	
Rinsate	
Transfer	
Other:	

Groundwater Sampling Form

Project Name 624 880 148 | Well No. MW-4C
Project Number 940817-Z2 | Well Type [X] Monitor [ ] Extraction [ ] Other
Recorded By BB | Sampled by – | Date 8/17/94

WELL PURGING

PURGE VOLUME

Well casing diameter
[ ] 2-inch [ ] 4-inch [ ] Other
Well Total Depth (TD, ft. below TOC)
Depth to Water (WL, ft. below TOC)
Depth to free phase hydrocarbons (FP, ft. below TOC)
Number of well volumes to be purged
[ ] 3 [ ] 10 [ ] Other

PURGE METHOD

[ ] Bailer - Type
[ ] Pump - Type
[ ] Other

PUMP INTAKE

[ ] Near top Depth (ft)
[ ] Near Bottom Depth (ft)
[ ] Other
Pumping Rate gpm

PURGE VOLUME CALCULATION

Water Column Length X Multiplier X No. Vols = gals CALCULATED PURGE VOLUME

MULTIPLIER (Casing Dia. [inches] = Gallons/linear ft)
2 = 0.17 | 3 = 0.38 | 4 = 0.66 | 4.5 = 0.83 | 5 = 1.02 | 6 = 1.5 | 8 = 2.6

gals ACTUAL PURGE VOLUME

GROUNDWATER PARAMETER MEASUREMENT

Meter Type

Time/Gallons	pH	Cond. (uomhos/cm)	Temp	[ ] deg C [ ] deg F	Turbidity (NTU)	Color/Odor
/						
/						
/						
/ NOT SAMPLED	WELL IN	ACCESSIBLE	(DIRT	OVER WELL)		
/						
/						
/						
/						

Comments during well purge
Well Pumped dry: YES NO
Purge water storage/disposal [ ] Drummed onsite [ ] Other

WELL SAMPLING

SAMPLING METHOD

Date/Time Sampled /
Bailer - Type [ ]
Sample port [ ] Other [ ]

GROUNDWATER SAMPLE PARAMETER MEASUREMENTS

Meter Type

Date/Time/% Recharge	pH	Cond. (uomhos/cm)	Temp	[ ] deg C [ ] deg F	Turbidity (NTU)	Color/Odor
/ /						

SAMPLING PROGRAM

Sample No.	Container #/Volume	Analysis	Preservatives	Laboratory	Comments

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.
Trip	
Rinsate	
Transfer	
Other:	

Groundwater Sampling Form

Project Name: 624880148 | Well No.: MW-4D
Project Number: 940817-7L | Well Type: [x] Monitor [ ] Extraction [ ] Other
Recorded By: BB | Sampled by: BB | Date: 8/17/94

WELL PURGING

PURGE VOLUME

Well casing diameter
[ ] 2-inch [x] 4-inch [ ] Other
Well Total Depth (TD, ft. below TOC): 19.84
Depth to Water (WL, ft. below TOC): 13.23
Depth to free phase hydrocarbons (FP, ft. below TOC):
Number of well volumes to be purged
[x] 3 [ ] 10 [ ] Other

PURGE METHOD

[ ] Bailer - Type
[x] Pump - Type: electric
[ ] Other

PUMP INTAKE

[ ] Near top Depth (ft)
[ ] Near Bottom Depth (ft)
[ ] Other
Pumping Rate: 2.0 gpm

PURGE VOLUME CALCULATION

6.6 (Water Column Length) X .66 (Multiplier) X 4.4 (No. Vols) = 13.2

13.2 gals — CALCULATED PURGE VOLUME

MULTIPLIER (Casing Dia.[inches] = Gallons/linear ft)
2 = 0.17 | 3 = 0.38 | 4 = 0.66 | 4.5 = 0.83 | 5 = 1.02 | 6 = 1.5 | 8 = 2.6

14.0 gals — ACTUAL PURGE VOLUME

GROUNDWATER PARAMETER MEASUREMENT

Meter Type:

Time/Gallons	pH	Cond. (uomhos/cm)	Temp [x] deg C [ ] deg F	Turbidity (NTU)	Color/Odor
1146 / 7.0	7.4	1000	75.2	5.1	odor
1149 / 10.0	7.3	880	73.6	2.0	"
1152 / 14.0	7.3	870	73.6	1.7	"
/					
/					
/					
/					
/					

Comments during well purge:
Well Pumped dry: YES (NO)
Purge water storage/disposal: [ ] Drummed onsite [x] Other: BTS

WELL SAMPLING

SAMPLING METHOD

Date/Time Sampled: 8/17/94 / 1200
Bailer - Type: [ ] 3SB
Sample port: [ ] Other: [ ]

GROUNDWATER SAMPLE PARAMETER MEASUREMENTS

Meter Type: Myron LPDs

Date/Time/% Recharge	pH	Cond. (uomhos/cm)	Temp [ ] deg C [ ] deg F	Turbidity (NTU)	Color/Odor
/ /					

SAMPLING PROGRAM

Sample No.	Container #/Volume	Analysis	Preservatives	Laboratory	Comments
MW-4D	3 / 40 ml VOA	TPH-G, BTEX	HCL	BC	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.
Trip	
Rinsate	
Transfer	
Other:	

Groundwater Sampling Form

Project Name 624 880 149 | Well No. MW-4E
Project Number 940871-Z1 | Well Type [X] Monitor [ ] Extraction [ ] Other
Recorded By BB | Sampled by BB | Date 8/17/94

WELL PURGING

PURGE VOLUME

Well casing diameter
[ ] 2-inch [X] 4-inch [ ] Other
Well Total Depth (TD, ft. below TOC) 19.50
Depth to Water (WL, ft. below TOC) 12.58
Depth to free phase hydrocarbons (FP, ft. below TOC)
Number of well volumes to be purged
[X] 3 [ ] 10 [ ] Other

PURGE METHOD

[ ] Bailer - Type
[X] Pump - Type Electric
[ ] Other

PUMP INTAKE

[ ] Near top Depth (ft)
[X] Near Bottom Depth (ft)
[ ] Other
Pumping Rate 2.0 gpm

PURGE VOLUME CALCULATION

6.92 (Water Column Length) X .66 (Multiplier) X 4.6 (No. Vols) = 13.8 gals CALCULATED PURGE VOLUME

MULTIPLIER (Casing Dia.[inches] = Gallons/linear ft)
2 = 0.17 | 3 = 0.38 | 4 = 0.66 | 4.5 = 0.83 | 5 = 1.02 | 6 = 1.5 | 8 = 2.6

14.0 gals ACTUAL PURGE VOLUME

GROUNDWATER PARAMETER MEASUREMENT

Meter Type

Time/Gallons	pH	Cond. (uomhos/cm)	Temp [ ] deg C [X] deg F	Turbidity (NTU)	Color/Odor
1335 / 5	7.7	610	77.0	6.1	odor
1339 / 10	7.6	620	76.6	7.5	"
1344 / 14	7.6	620	76.2	10.6	"
/					
/					
/					
/					
/					

Comments during well purge Slow recharge
Well Pumped dry: YES (NO)
Purge water storage/disposal [ ] Drummed onsite [X] Other BTS

WELL SAMPLING

SAMPLING METHOD

Date/Time Sampled 8/17/94 / 1350
Bailer - Type [X] SSB
Sample port [ ] Other [ ]

GROUNDWATER SAMPLE PARAMETER MEASUREMENTS

Meter Type Myron LPDS

Date/Time/% Recharge	pH	Cond. (uomhos/cm)	Temp [ ] deg C [ ] deg F	Turbidity (NTU)	Color/Odor
/ /					

SAMPLING PROGRAM

Sample No.	Container #/Volume	Analysis	Preservatives	Laboratory	Comments
MW-4E	3 / 40 ml VOA	TPH-G, BTEX	HCL	BC	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.
Trip	
Rinsate	
Transfer	
Other:	

Groundwater Sampling Form

Project Name 624 880 148
Project Number 940817-Z2
Recorded By BB
Well No. MW-4F
Well Type [x] Monitor [ ] Extraction [ ] Other
Sampled by
Date 8/17/94

WELL PURGING

PURGE VOLUME

Well casing diameter
[ ] 2-inch [x] 4-inch [ ] Other
Well Total Depth (TD, ft. below TOC) –
Depth to Water (WL, ft. below TOC) 11.65
Depth to free phase hydrocarbons (FP, ft. below TOC) 11.63
Number of well volumes to be purged
[ ] 3 [ ] 10 [ ] Other

PURGE METHOD

[ ] Bailer - Type
[ ] Pump - Type
[ ] Other

PUMP INTAKE

[ ] Near top Depth (ft)
[ ] Near Bottom Depth (ft)
[ ] Other
Pumping Rate gpm

PURGE VOLUME CALCULATION

Water Column Length X Multiplier X No. Vols = gals CALCULATED PURGE VOLUME

MULTIPLIER (Casing Dia. [inches] = Gallons/linear ft)
2 = 0.17 | 3 = 0.38 | 4 = 0.66 | 4.5 = 0.83 | 5 = 1.02 | 6 = 1.5 | 8 = 2.6

gals ACTUAL PURGE VOLUME

GROUNDWATER PARAMETER MEASUREMENT

Meter Type

Time/Gallons	pH	Cond. (uomhos/cm)	Temp	deg C / deg F	Turbidity (NTU)	Color/Odor
/						
/						
/						
/ NOT SAMPLED		FREE PRODUCT FOUND				
/						
/						
/						
/						

Comments during well purge
Well Pumped dry: YES NO
Purge water storage/disposal [ ] Drummed onsite [ ] Other

WELL SAMPLING

SAMPLING METHOD

Date/Time Sampled /
Bailer - Type [ ]
Sample port [ ] Other [ ]

GROUNDWATER SAMPLE PARAMETER MEASUREMENTS

Meter Type

Date/Time/% Recharge	pH	Cond. (uomhos/cm)	Temp	deg C / deg F	Turbidity (NTU)	Color/Odor
/ /						

SAMPLING PROGRAM

Sample No.	Container #/Volume	Analysis	Preservatives	Laboratory	Comments

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.
Trip	
Rinsate	
Transfer	
Other:	

Groundwater Sampling Form

Project Name 624 880 148 | Well No. MW-46

Project Number 624 940817-Z2 | Well Type [X] Monitor [ ] Extraction [ ] Other

Recorded By BB | Sampled by — | Date 8/17/94

WELL PURGING

PURGE VOLUME

Well casing diameter

[ ] 2-inch [X] 4-inch [ ] Other

Well Total Depth (TD, ft. below TOC) —

Depth to Water (WL, ft. below TOC) 11.90

Depth to free phase hydrocarbons (FP, ft. below TOC) 11.65

Number of well volumes to be purged

[ ] 3 [ ] 10 [ ] Other

PURGE METHOD

[ ] Bailer - Type

[ ] Pump - Type

[ ] Other

PUMP INTAKE

[ ] Near top Depth (ft)

[ ] Near Bottom Depth (ft)

[ ] Other

Pumping Rate ____ gpm

PURGE VOLUME CALCULATION

____ (Water Column Length) X ____ (Multiplier) X ____ (No. Vols) = ____ gals CALCULATED PURGE VOLUME

MULTIPLIER (Casing Dia [inches] = Gallons/linear ft)

2 = 0.17 | 3 = 0.38 | 4 = 0.66 | 4.5 = 0.83 | 5 = 1.02 | 6 = 1.5 | 8 = 2.6

____ gals ACTUAL PURGE VOLUME

GROUNDWATER PARAMETER MEASUREMENT

Meter Type

Time/Gallons	pH	Cond. (uomhos/cm)	Temp	[ ] deg C [ ] deg F	Turbidity (NTU)	Color/Odor
/						
/						
/						
/						
/ NOT SAMPLED		FREE	PRODUCT	FOUND		
/						
/						
/						

Comments during well purge

Well Pumped dry: YES NO

Purge water storage/disposal [ ] Drummed onsite [ ] Other

WELL SAMPLING

SAMPLING METHOD

Date/Time Sampled /

Bailer - Type [ ]

Sample port [ ] Other [ ]

GROUNDWATER SAMPLE PARAMETER MEASUREMENTS

Meter Type

Date/Time/% Recharge	pH	Cond. (uomhos/cm)	Temp	[ ] deg C [ ] deg F	Turbidity (NTU)	Color/Odor
/ /						

SAMPLING PROGRAM

Sample No.	Container #/Volume	Analysis	Preservatives	Laboratory	Comments

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.
Trip	
Rinsate	
Transfer	
Other:	

Groundwater Sampling Form

Project Name 624 880 148 | Well No. MW-4H

Project Number 940817-2L | Well Type [X] Monitor [ ] Extraction [ ] Other

Recorded By BB | Sampled by — | Date 8/17/94

WELL PURGING

PURGE VOLUME

Well casing diameter

[ ] 2-inch [X] 4-inch [ ] Other

Well Total Depth (TD, ft. below TOC) —

Depth to Water (WL, ft. below TOC) 12.36

Depth to free phase hydrocarbons (FP, ft. below TOC) 12.27

Number of well volumes to be purged

[ ] 3 [ ] 10 [ ] Other

PURGE METHOD

[ ] Bailer - Type

[ ] Pump - Type

[ ] Other

PUMP INTAKE

[ ] Near top Depth (ft)

[ ] Near Bottom Depth (ft)

[ ] Other

Pumping Rate gpm

PURGE VOLUME CALCULATION

Water Column Length X Multiplier X No. Vols = gals CALCULATED PURGE VOLUME

MULTIPLIER (Casing Dia [inches] = Gallons/linear ft)

2 = 0.17 | 3 = 0.38 | 4 = 0.66 | 4.5 = 0.83 | 5 = 1.02 | 6 = 1.5 | 8 = 2.6

gals ACTUAL PURGE VOLUME

GROUNDWATER PARAMETER MEASUREMENT

Meter Type

Time/Gallons	pH	Cond. (uomhos/cm)	Temp	deg C / deg F	Turbidity (NTU)	Color/Odor
/						
/						
/						
/						
/ NOT SAMPLED FREE PRODUCT FOUND						
/						
/						
/						

Comments during well purge

Well Pumped dry: YES NO

Purge water storage/disposal [ ] Drummed onsite [ ] Other

WELL SAMPLING

SAMPLING METHOD

Date/Time Sampled /

Bailer - Type [ ]

Sample port [ ] Other [ ]

GROUNDWATER SAMPLE PARAMETER MEASUREMENTS

Meter Type

Date/Time/% Recharge	pH	Cond. (uomhos/cm)	Temp	deg C / deg F	Turbidity (NTU)	Color/Odor
/						

SAMPLING PROGRAM

Sample No.	Container #/Volume	Analysis	Preservatives	Laboratory	Comments

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.
Trip	
Rinsate	
Transfer	
Other:	

Groundwater Sampling Form

Project Name 684 880148 Well No. MW-41

Project Number 940817-ZZ Well Type ☑ Monitor ☐ Extraction ☐ Other

Recorded By BB Sampled by BB Date 8/17/94

WELL PURGING

PURGE VOLUME

Well casing diameter

☐ 2-inch ☑ 4-inch ☐ Other

Well Total Depth (TD, ft. below TOC) 18.54

Depth to Water (WL, ft. below TOC) 10.62

Depth to free phase hydrocarbons (FP, ft. below TOC)

Number of well volumes to be purged

☑ 3 ☐ 10 ☐ Other

PURGE METHOD

☐ Bailer - Type

☑ Pump - Type electric

☐ Other

PUMP INTAKE

☐ Near top Depth (ft)

☑ Near Bottom Depth (ft)

☐ Other

Pumping Rate 2.0 gpm

PURGE VOLUME CALCULATION

7.9 (Water Column Length) X 3 (Multiplier) X 5.2 (No. Vols) = 15.6 gals CALCULATED PURGE VOLUME

MULTIPLIER (Casing Dia.[inches] = Gallons/linear ft)
2 = 0.17 | 3 = 0.38 | 4 = 0.66 | 4.5 = 0.83 | 5 = 1.02 | 6 = 1.5 | 8 = 2.6

16.0 gals ACTUAL PURGE VOLUME

GROUNDWATER PARAMETER MEASUREMENT

Meter Type

Time/Gallons	pH	Cond. (uomhos/cm)	Temp	deg C / deg F	Turbidity (NTU)	Color/Odor
1211 / 6	7.2	780	75.8	F	7.1	odor
1214 / 12	7.0	700	74.6	F	5.7	"
1217 / 16	7.0	710	74.6	F	2.6	"
/						
/						
/						
/						
/						

Comments during well purge

Well Pumped dry: YES (NO)

Purge water storage/disposal ☐ Drummed onsite ☑ Other BTS

WELL SAMPLING

SAMPLING METHOD

Date/Time Sampled 8/17/94 / 1225

Bailer - Type ☐ 3538

Sample port ☐ Other ☐

GROUNDWATER SAMPLE PARAMETER MEASUREMENTS

Meter Type Myron LpDs

Date/Time/% Recharge	pH	Cond. (uomhos/cm)	Temp	deg C / deg F	Turbidity (NTU)	Color/Odor
/ /						

SAMPLING PROGRAM

Sample No.	Container #/Volume	Analysis	Preservatives	Laboratory	Comments
MW-41	3 / 40 ml VOA	TPH-G, BTEX	HCL	BC	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.
Trip	
Rinsate	EB @ 1205
Transfer	
Other:	

Groundwater Sampling Form

Project Name 624 880 NB
Project Number 940817-22
Recorded By BB
Well No. MW-4J
Well Type ☐ Monitor ☐ Extraction ☐ Other
Sampled by
Date 8/17/94

WELL PURGING

PURGE VOLUME

Well casing diameter
☐ 2-inch ☒ 4-inch ☐ Other
Well Total Depth (TD, ft. below TOC) –
Depth to Water (WL, ft. below TOC) 12.23
Depth to free phase hydrocarbons (FP, ft. below TOC) 12.20
Number of well volumes to be purged
☐ 3 ☐ 10 ☐ Other

PURGE METHOD

☐ Bailer - Type
☐ Pump - Type
☐ Other

PUMP INTAKE

☐ Near top Depth (ft)
☐ Near Bottom Depth (ft)
☐ Other

Pumping Rate gpm

PURGE VOLUME CALCULATION

Water Column Length X Multiplier X No. Vols = gals CALCULATED PURGE VOLUME

gals ACTUAL PURGE VOLUME

MULTIPLIER (Casing Dia.[inches] = Gallons/linear ft)
2 = 0.17 | 3 = 0.38 | 4 = 0.66 | 4.5 = 0.83 | 5 = 1.02 | 6 = 1.5 | 8 = 2.6

GROUNDWATER PARAMETER MEASUREMENT

Meter Type

Time/Gallons	pH	Cond. (uomhos/cm)	Temp	☐ deg C ☐ deg F	Turbidity (NTU)	Color/Odor
/						
/						
/						
/ NOT SAMPLED FREE PRODUCT FOUND						
/						
/						
/						
/						

Comments during well purge

Well Pumped dry: YES NO

Purge water storage/disposal ☐ Drummed onsite ☐ Other

WELL SAMPLING

SAMPLING METHOD

Date/Time Sampled /
Bailer - Type ☐
Sample port ☐ Other ☐

GROUNDWATER SAMPLE PARAMETER MEASUREMENTS

Meter Type

Date/Time/% Recharge	pH	Cond. (uomhos/cm)	Temp	☐ deg C ☐ deg F	Turbidity (NTU)	Color/Odor
/ /						

SAMPLING PROGRAM

Sample No.	Container #/Volume	Analysis	Preservatives	Laboratory	Comments

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.
Trip	
Rinsate	
Transfer	
Other:	

Groundwater Sampling Form

Project Name 624 880148 Well No. MW-4K

Project Number 940817-Z2 Well Type [X] Monitor [ ] Extraction [ ] Other

Recorded By BB Sampled by BB Date 8/17/94

WELL PURGING

PURGE VOLUME

Well casing diameter

[X] 2-inch [ ] 4-inch [ ] Other

Well Total Depth (TD, ft. below TOC) 19.74

Depth to Water (WL, ft. below TOC) 12.02

Depth to free phase hydrocarbons (FP, ft. below TOC)

Number of well volumes to be purged

[X] 3 [ ] 10 [ ] Other

PURGE METHOD

[ ] Bailer - Type

[X] Pump - Type Electric

[ ] Other

PUMP INTAKE

[ ] Near top Depth (ft)

[X] Near Bottom Depth (ft)

[ ] Other

Pumping Rate 2.0 gpm

PURGE VOLUME CALCULATION

7.72 (Water Column Length) X .17 (Multiplier) X 1.3 (No. Vols) = 3.9 gals CALCULATED PURGE VOLUME

MULTIPLIER (Casing Dia.[inches] = Gallons/linear ft)
2 = 0.17 | 3 = 0.38 | 4 = 0.66 | 4.5 = 0.83 | 5 = 1.02 | 6 = 1.5 | 8 = 2.6

4.0 gals ACTUAL PURGE VOLUME

GROUNDWATER PARAMETER MEASUREMENT

Meter Type

Time/Gallons	pH	Cond. (uomhos/cm)	Temp [ ] deg C [X] deg F	Turbidity (NTU)	Color/Odor
1257 / 2.0	7.3	1000	75.4	179.5	odor
1258 / 3.0	7.3	1000	74.6	61.4	"
1259 / 4.0	7.3	900	74.6	30.8	"
/					
/					
/					
/					
/					

Comments during well purge

Well Pumped dry: YES (NO)

Purge water storage/disposal [ ] Drummed onsite [X] Other BTS

WELL SAMPLING

SAMPLING METHOD

Date/Time Sampled 8/17/94 / 1305

Bailer - Type [ ] SSB

Sample port [ ] Other [ ]

GROUNDWATER SAMPLE PARAMETER MEASUREMENTS

Meter Type Myron LpDS

Date/Time/% Recharge	pH	Cond. (uomhos/cm)	Temp [ ] deg C [ ] deg F	Turbidity (NTU)	Color/Odor
/ /					

SAMPLING PROGRAM

Sample No.	Container #/Volume	Analysis	Preservatives	Laboratory	Comments
MW-4K	3 / 40 ml VOA	TPH-G, BTEX	HCl	BC, A	

QUALITY CONTROL SAMPLES

Duplicate Samples

Original Sample No.	Duplicate Sample No.

Blank Samples

Type	Sample No.
Trip	
Rinsate	
Transfer	
Other:	

ATTACHMENT D

HISTORICAL SOIL VAPOR EXTRACTION SYSTEM PERFORMANCE DATA