



PACIFIC  
ENVIRONMENTAL  
GROUP, INC.

February 15, 1996  
Project 330-041.2B

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

Re: Quarterly Report - Fourth Quarter 1995  
ARCO Service Station 4494  
566 Hegenberger Road at Edes Avenue  
Oakland, California

Dear Mr. Whelan:

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

#### **QUARTERLY GROUNDWATER MONITORING RESULTS**

A groundwater sample was collected from Well RW-1 by PACIFIC on November 17, 1995, and analyzed for the presence of total purgeable petroleum hydrocarbons calculated as gasoline (TPPH-g), benzene, toluene, ethylbenzene, and xylenes (BTEX compounds). A groundwater sampling schedule is presented in Table 1. The certified analytical report, chain-of-custody documentation, and field data sheets are presented as Attachment A. Field and laboratory procedures are presented as Attachment B.

Depth to water data collected on November 17, 1995 indicate that changes to groundwater levels across the site have decreased and average of 0.67 foot since August 23, 1995. Groundwater flow was to the northwest with an approximate gradient of 0.016. This flow direction and gradient are consistent with historical data. Liquid surface elevation data are presented in Table 2. A groundwater elevation contour map based on the November 17, 1995 data is shown on Figure 1.

Well RW-1 was the only on-site well sampled this quarter. TPPH-g and benzene concentrations were 1,100 and 7.6 parts per billion, respectively. Separate-phase hydrocarbons were not observed in any site well this quarter. Groundwater analytical data are presented in Tables 3 and 4. A TPPH-g and benzene concentration map is shown on Figure 2.

As agreed upon in the meeting on October 25, 1995, and documented in meeting minutes dated December 29, 1995, the last groundwater monitoring event was performed during this quarter. No additional groundwater monitoring will be performed at this site.

## **SUMMARY OF WORK**

### **Work Performed Fourth Quarter 1995**

- Prepared and submitted third quarter 1995 groundwater monitoring report.
- Performed fourth quarter 1995 groundwater monitoring event. Groundwater sampling was performed by PACIFIC.
- Prepared fourth quarter 1995 groundwater monitoring report.
- Met with Mr. Barney Chan of the Alameda County Health Care Services Agency to discuss site closure.
- Prepared and submitted minutes to the October 25, 1995 meeting with the Alameda County Health Care Services Agency.


### **Work Anticipated First Quarter 1996**

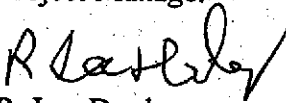
- Preparation and submittal of fourth quarter 1995 groundwater monitoring report.
- Performance of first quarter 1996 groundwater monitoring event. Groundwater sampling to be performed by PACIFIC.
- Preparation of first quarter 1996 groundwater monitoring report.

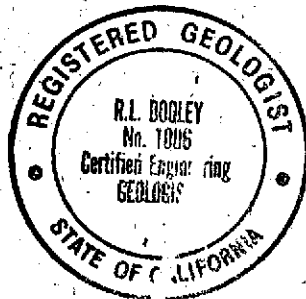
If there are any questions regarding the contents of this letter, please call.

Sincerely,

**Pacific Environmental Group, Inc.**

  
Kelly C. Brown  
Project Manager

  
R. Lee Dooley  
Senior Geologist  
CEG 1006



- Attachments:
- Table 1 - Groundwater Sampling Schedule
  - Table 2 - Liquid Surface Elevation Data
  - Table 3 - Groundwater Analytical Data - Total Petroleum Hydrocarbons (TPH as Gasoline, BTEX Compounds, TPH as Diesel, and Total Oil and Grease)
  - Table 4 - Groundwater Analytical Data - Total Methyl t-Butyl Ether
  - Figure 1 - Groundwater Elevation Contour Map
  - Figure 2 - TPPH-g/Benzene Concentration Map
  - Attachment A - Certified Analytical Report, Chain-of-Custody Documentation, and Field Data Sheets
  - Attachment B - Field and Laboratory Procedures

cc: Mr. Kevin Graves, Regional Water Quality Control Board - S.F. Bay Region  
✓ Mr. Barney Chan, Alameda County Health Care Services Agency

Table 1  
Groundwater Sampling Schedule

ARCO Service Station 4494  
566 Hegenberger Road at Edes Avenue  
Oakland, California

Well Number	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Sample Frequency
MW-1		a			Annually
MW-3		a			Annually
MW-4		a			Annually
MW-5		a			Annually
MW-6		a			Annually
MW-7		a			Annually
RW-1	a	a	a	a	Quarterly

a. Samples analyzed for TPH-g and BTEX compounds according to EPA Methods 8015 (modified), and 8020.  
Note: Well MW-2 was destroyed.

Table 2  
Liquid Surface Elevation Data

ARCO Service Station 4494  
566 Hegenberger Road at Edes Avenue  
Oakland, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Water (feet, TOC)	Depth to Liquid (feet, TOC)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)
MW-1	06/06/90	105.31	6.65	6.05	0.00	98.66
	08/16/90		7.00	7.00	0.00	98.31
	08/21/90		7.05	7.05	0.00	98.26
	09/07/90		7.24	7.24	0.00	98.07
	11/20/90		7.46	7.46	0.00	97.85
	11/29/90		7.40	7.40	0.00	97.91
	12/19/90		6.99	6.99	0.00	98.32
	01/29/91		7.23	7.23	0.00	98.08
	02/27/91		7.45	7.45	0.00	97.86
	03/07/91		6.96	6.96	0.00	98.35
	03/26/91		6.02	6.02	0.00	99.29
	05/02/91		7.04	7.04	0.00	98.27
	06/27/91		6.71	6.71	0.00	98.60
	07/24/91		6.91	6.91	0.00	98.40
	08/22/91		6.85	6.85	0.00	98.46
	09/30/91		7.04	7.04	0.00	98.27
	10/17/91		7.22	7.22	0.00	98.09
	11/21/91		7.17	7.17	0.00	98.14
	12/18/91		7.46	7.46	0.00	97.85
	01/19/92		7.44	7.44	0.00	97.87
	02/20/92		6.25	6.25	0.00	99.06
	03/20/92		6.40	6.40	0.00	98.91
	04/20/92		6.88	6.88	0.00	98.43
	05/19/92		7.10	7.10	0.00	98.21
	06/08/92		7.22	7.22	0.00	98.09
	07/15/92		7.92	7.92	0.00	97.39
	08/06/92	106.10	7.29	7.29	0.00	98.81
	10/29/92		7.34	7.34	0.00	98.76
	11/23/92		8.15	8.15	0.00	97.95
	08/16/93		7.23	7.23	0.00	98.87
11/17/93		7.51	7.51	0.00	98.59	
02/21/94		6.56	6.56	0.00	99.54	
05/11/94		6.57	6.57	0.00	99.53	
08/12/94		7.12	7.12	0.00	98.98	
11/17/94		6.85	6.85	0.00	99.25	
02/22/95		7.35	7.35	0.00	98.75	
05/24/95		7.07	7.07	0.00	99.03	
08/23/95		7.10	7.10	0.00	99.00	
11/17/95		7.72	7.72	0.00	98.38	
MW-2	06/06/90	105.78	9.92 *	9.00	0.92	95.86
	08/16/90		NM	NM	0.17	NM
	08/21/90		NM	NM	0.17	NM
	09/07/90		9.34 *	9.17	0.17	96.44
	11/20/90		9.20 *	9.20	Sheen	96.58
	11/29/90		9.92 *	9.92	Sheen	95.86
	12/19/90		8.95	8.95	0.00	96.83
	01/29/91		9.01	9.01	Sheen	96.77
	02/27/91		9.14	9.14	Sheen	96.64
	03/07/91		8.94	8.94	Sheen	96.84
03/26/91		8.11	8.11	Sheen	97.67	
05/02/91		8.72	8.72	0.00	97.06	

Table 2 (continued)  
Liquid Surface Elevation Data

ARCO Service Station 4494  
566 Hegenberger Road at Edes Avenue  
Oakland, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Water (feet, TOC)	Depth to Liquid (feet, TOC)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)	
MW-2	06/27/91		9.20	9.20	Sheen	96.58	
(cont.)	07/24/91		9.25	9.25	0.00	96.53	
	08/22/91		9.20	9.20	0.00	96.58	
	09/30/91		9.31	9.31	Sheen	96.47	
	10/17/91		9.39	9.39	Sheen	96.39	
	11/21/91		9.20	9.20	0.00	96.58	
	12/18/91		9.23	9.23	Sheen	96.55	
	01/19/92		9.96 **	9.96	Skimmer	95.82	
	02/20/92		9.13 **	9.13	Skimmer	96.65	
	03/20/92		9.31 **	9.31	Skimmer	96.47	
	04/20/92		9.69	9.69	Skimmer	96.09	
	05/19/92		9.92	9.92	Skimmer	95.86	
	06/08/92		9.84	9.84	Skimmer	95.94	
	07/15/92		10.19	10.19	Skimmer	95.59	
	08/06/92	106.57	10.05	10.05	Skimmer	96.52	
	10/29/92		10.00	10.00	Skimmer	96.57	
	11/23/92		9.88	9.87	0.01	96.69	
	12/08/92		Well Destroyed				
MW-3	08/16/90	105.51	8.87	8.87	0.00	96.64	
	08/21/90		8.85	8.85	0.00	96.66	
	09/07/90		8.98	8.98	0.00	96.53	
	11/20/90		9.10	9.10	0.00	96.41	
	11/29/90		9.05	9.05	0.00	96.48	
	12/19/90		8.67	8.67	0.00	96.84	
	01/29/91		8.96	8.96	0.00	96.55	
	02/27/91		8.71	8.71	0.00	96.80	
	03/07/91		8.49	8.49	0.00	97.02	
	03/26/91		7.65	7.65	0.00	97.86	
	05/02/91		8.62	8.62	0.00	96.89	
	06/27/91		8.94	8.94	0.00	96.57	
	07/24/91		8.96	8.96	0.00	96.55	
	08/22/91		8.92	8.92	0.00	96.59	
	09/30/91		9.04	9.04	0.00	96.47	
	10/17/91		9.12	9.12	0.00	96.39	
	11/21/91		8.92	8.92	0.00	96.59	
	12/18/91		8.97	8.97	0.00	96.54	
	01/19/92		8.69	8.69	0.00	96.82	
	02/20/92		7.78	7.78	0.00	97.73	
	03/20/92		8.15	8.15	0.00	97.36	
	04/20/92		8.57	8.57	0.00	96.94	
	05/19/92		8.76	8.76	0.00	96.75	
	06/08/92		8.74	8.74	0.00	96.77	
	07/15/92		9.12	9.12	0.00	96.39	
	08/06/92	106.29	8.95	8.95	0.00	97.34	
	10/29/92		8.78	8.78	0.00	97.51	
	11/23/92		9.91	9.91	0.00	96.38	
	08/16/93		8.62	8.62	0.00	97.67	
	11/17/93		8.72	8.72	0.00	97.57	
	02/21/94		7.91	7.91	0.00	98.38	
	05/11/94		8.09	8.09	0.00	98.20	

Table 2 (continued)  
Liquid Surface Elevation Data

ARCO Service Station 4494  
566 Hegenberger Road at Edes Avenue  
Oakland, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Water (feet, TOC)	Depth to Liquid (feet, TOC)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)
MW-3	08/12/94		8.78	8.78	0.00	97.51
(cont.)	11/17/94		8.45	8.45	0.00	97.84
	02/22/95		8.95	8.95	0.00	97.34
	05/24/95		8.67	8.67	0.00	97.62
	08/23/95		9.17	9.17	0.00	97.12
	11/17/95		9.39	9.39	0.00	96.90
MW-4	08/16/90	106.61	8.16	8.16	0.00	98.45
	08/21/90		8.22	8.22	0.00	98.39
	09/07/90		8.39	8.39	0.00	98.22
	11/20/90		8.57	8.57	0.00	98.04
	11/29/90		8.53	8.53	0.00	98.08
	12/19/90		8.13	8.13	0.00	98.48
	01/29/91		8.66	8.66	0.00	97.95
	02/27/91		8.44	8.44	0.00	98.17
	03/07/91		8.18	8.18	0.00	98.43
	03/26/91		7.56	7.56	0.00	99.05
	05/02/91		8.25	8.25	0.00	98.36
	06/27/91		7.75	7.75	0.00	98.86
	07/24/91		8.12	8.12	0.00	98.49
	08/22/91		7.98	7.98	0.00	98.63
	09/30/91		8.26	8.26	0.00	98.35
	10/17/91		8.42	8.42	0.00	98.19
	11/21/91		8.65	8.65	0.00	97.96
	12/18/91		8.77	8.77	0.00	97.84
	01/19/92		8.42	8.42	0.00	98.19
	02/20/92		7.60	7.60	0.00	99.01
	03/20/92		7.61	7.61	0.00	99.00
	04/20/92		8.15	8.15	0.00	98.46
	05/19/92		8.14	8.14	0.00	98.47
	06/08/92		8.40	8.40	0.00	98.21
	07/15/92		8.72	8.72	0.00	97.89
	08/06/92	107.40	8.52	8.52	0.00	98.88
	10/29/92		8.63	8.63	0.00	98.77
	11/23/92		8.75	8.75	0.00	98.65
	08/16/93		8.69	8.69	0.00	98.71
	11/17/93		9.11	9.11	0.00	98.29
	02/21/94		8.16	8.16	0.00	99.24
	05/11/94		8.29	8.29	0.00	99.11
	08/12/94		8.75	8.75	0.00	98.65
	11/17/94		8.40	8.40	0.00	99.00
	02/22/95		8.72	8.72	0.00	98.68
	05/24/95		8.63	8.63	0.00	98.77
	08/23/95		6.50	6.50	0.00	100.90
	11/17/95		9.15	9.15	0.00	98.25
MW-5	08/06/92	105.19	7.19	7.19	0.00	98.00
	10/29/92		6.99	6.99	0.00	98.20
	11/23/92		6.90	6.90	0.00	98.29
	08/16/93		7.06	7.06	0.00	98.13
	11/17/93		6.91	6.91	0.00	98.28
	02/21/94		5.52	5.52	0.00	99.67
	05/11/94		6.18	6.18	0.00	99.01
	08/12/94		6.81	6.81	0.00	98.38
	11/17/94		5.38	5.38	0.00	99.81
	02/22/95		6.25	6.25	0.00	98.94

Table 2 (continued)  
Liquid Surface Elevation Data

ARCO Service Station 4494  
566 Hegenberger Road at Edes Avenue  
Oakland, California

Well Number	Date Gauged	Well Elevation (feet, MSL)	Depth to Water (feet, TOC)	Depth to Liquid (feet, TOC)	SPH Thickness (feet)	Liquid Surface Elevation (feet, MSL)	
MW-5 (cont.)	05/24/95		6.30	6.30	0.00	98.89	
	08/23/95		6.90	6.90	0.00	98.29	
	11/17/95		7.02	7.02	0.00	98.17	
MW-6	08/08/92	105.07	7.01	7.01	0.00	98.06	
	10/29/92		6.70	6.70	0.00	98.37	
	11/23/92		6.75	6.75	0.00	98.32	
	08/16/93		6.71	6.71	0.00	98.36	
	11/17/93		6.67	6.67	0.00	98.40	
	02/21/94		5.31	5.31	0.00	99.76	
	05/11/94		5.98	5.98	0.00	99.09	
	08/12/94		6.60	6.60	0.00	98.47	
	11/17/94		5.09	5.09	0.00	99.98	
	02/22/95		5.85	5.85	0.00	99.22	
	05/24/95		5.92	5.92	0.00	99.15	
	08/23/95		6.50	6.50	0.00	98.57	
	11/17/95		6.75	6.75	0.00	98.32	
MW-7	08/08/92	105.52	8.28	8.28	0.00	97.24	
	10/29/92		8.62	8.62	0.00	96.90	
	11/23/92		8.21	8.21	0.00	97.31	
	08/16/93		8.11	8.11	0.00	97.41	
	11/17/93		8.11	8.11	0.00	97.41	
	02/21/94		7.34	7.34	0.00	98.18	
	05/11/94		7.45	7.45	0.00	98.07	
	08/12/94		8.13	8.13	0.00	97.39	
	11/17/94		7.90	7.90	0.00	97.62	
	02/22/95		8.40	8.40	0.00	97.12	
	05/24/95		8.29	8.29	0.00	97.23	
	08/23/95		8.60	8.60	0.00	96.92	
	11/17/95		8.73	8.73	0.00	96.79	
RW-1	08/16/93	NM	Well Dry				
	11/17/93		Well Dry				
	02/21/94		7.69	7.69	0.00	NM	
	05/11/94		7.96	7.96	0.00	NM	
	08/12/94		7.58	7.58	0.00	NM	
	11/17/94		7.66	7.66	0.00	NM	
	02/22/95		8.00	8.00	0.00	NM	
	05/24/95		8.10	8.10	0.00	NM	
	08/23/95		8.67	8.67	0.00	NM	
	11/17/95		9.15	9.15	0.00	NM	

MSL = Mean sea level  
 TOC = Top of casing  
 \* = Separate-phase hydrocarbons present in well.  
 \*\* = Skimmer installed (12/24/91).  
 NM = Not measured



Table 3  
**Groundwater Analytical Data**  
**Total Petroleum Hydrocarbons**  
 (TPPH as Gasoline, BTEX Compounds, TEPH as Diesel, and Total Oil and Grease)

ARCO Service Station 4494  
 566 Hegenberger Road at Edes Avenue  
 Oakland, California

Well Number	Date Sampled	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	TEPH as Diesel (ppb)	Total Oil and Grease (ppm)	
MW-1	06/19/90	<50	<0.50	<0.50	<0.50	<0.50	<0.50	<5,000	
	08/16/90	<20	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	09/07/90	N/A	N/A	N/A	N/A	N/A	N/A	<5,000	
	11/29/90	<50	<0.50	0.7	<0.50	<0.50	N/A	N/A	
	03/07/91	<50	<0.30	<0.30	<0.30	<0.50	N/A	N/A	
	06/27/91	<30	<0.30	<0.30	<0.30	<0.30	N/A	N/A	
	09/30/91	<30	<0.30	<0.30	<0.30	<0.30	N/A	N/A	
	12/18/91	<30	<0.30	<0.30	<0.30	<0.30	N/A	N/A	
	03/20/92	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	06/08/92	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	08/06/92	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	10/29/92	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	08/16/93	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	11/17/93	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	02/22/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	05/11/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	08/12/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	11/17/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	02/22/95	-----Well Sampled Annually-----							
	05/24/95	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
08/23/95	-----Well Sampled Annually-----								
11/17/95	-----Well Sampled Annually-----								
MW-2	06/19/90	----- 0.92 foot of Separate-Phase Hydrocarbons -----							
	08/16/90	----- 0.17 foot of Separate-Phase Hydrocarbons -----							
	09/07/90	----- 0.17 foot of Separate-Phase Hydrocarbons -----							
	11/29/90	----- Separate-Phase Hydrocarbon Sheen -----							
	03/07/91	----- Separate-Phase Hydrocarbon Sheen -----							
	06/27/91	----- Separate-Phase Hydrocarbon Sheen -----							
	09/30/91	----- Separate-Phase Hydrocarbon Sheen -----							
	12/18/91	----- Separate-Phase Hydrocarbon Sheen -----							
	03/20/92	48,000	2,000	580	2,300	7,000	N/A	N/A	
	06/08/92	43,000	2,900	940	2,400	5,100	N/A	N/A	
	08/06/92	78,000	2,500	6,700	2,900	16,000	N/A	N/A	
10/29/92	NS	NS	NS	NS	NS	NS	NS		
12/08/92	-----Well Destroyed-----								
MW-3	06/19/90	<20	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	08/16/90	N/A	N/A	N/A	N/A	N/A	N/A	<5,000	
	09/07/90	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	11/29/90	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	03/07/91	<50	<0.30	<0.30	<0.30	<0.50	N/A	N/A	
	06/27/91	<30	<0.30	<0.30	<0.50	<0.30	N/A	N/A	
	09/30/91	<30	<0.30	<0.30	<0.30	<0.30	N/A	N/A	
	12/18/91	<30	<0.30	<0.30	<0.30	<0.30	N/A	N/A	
	03/20/92	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	06/08/92	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	08/06/92	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	10/29/92	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	08/16/93	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	11/17/93	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	

Table 3 (continued)  
**Groundwater Analytical Data**  
 Total Petroleum Hydrocarbons  
 (TPPH as Gasoline, BTEX Compounds, TEPH as Diesel, and Total Oil and Grease)

ARCO Service Station 4494  
 566 Hegenberger Road at Edes Avenue  
 Oakland, California

Well Number	Date Sampled	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	TEPH as Diesel (ppb)	Total Oil and Grease (ppm)	
MW-3 (cont.)	02/22/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	05/11/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	08/12/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	11/17/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	02/22/95	-----Well Sampled Annually-----							
	05/24/95	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	08/23/95	-----Well Sampled Annually-----							
	11/17/95	-----Well Sampled Annually-----							
MW-4	08/16/90	<20	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	09/07/90	N/A	N/A	N/A	N/A	N/A	N/A	<5,000	
	11/29/90	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	03/07/91	<50	<0.30	<0.30	<0.30	<0.50	N/A	N/A	
	06/27/91	<30	0.75	1.1	<0.30	1.6	N/A	N/A	
	09/30/91	<30	<0.30	<0.30	<0.30	<0.30	N/A	N/A	
	12/18/91	<30	0.83	1.2	<0.30	0.58	N/A	N/A	
	03/20/92	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	06/08/92	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	08/06/92	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	10/29/92	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	08/16/93	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	11/17/93	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	02/22/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	05/11/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	08/12/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	11/17/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
02/22/95	-----Well Sampled Annually-----								
05/24/95	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A		
08/23/95	-----Well Sampled Annually-----								
11/17/95	-----Well Sampled Annually-----								
MW-5	08/06/92	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	10/29/92	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	08/16/93	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	11/17/93	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	02/22/94	<50	<0.5	<0.5	<0.5	0.6	N/A	N/A	
	05/11/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	08/12/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	11/17/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	02/22/95	-----Well Sampled Annually-----							
	05/24/95	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	08/23/95	-----Well Sampled Annually-----							
11/17/95	-----Well Sampled Annually-----								
MW-6	08/06/92	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A	
	10/29/92	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	08/16/93	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	11/17/93	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	02/22/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	05/11/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	08/12/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
	11/17/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	
02/22/95	-----Well Sampled Annually-----								

Table 3 (continued)  
**Groundwater Analytical Data**  
 Total Petroleum Hydrocarbons  
 (TPPH as Gasoline, BTEX Compounds, TEPH as Diesel, and Total Oil and Grease)

ARCO Service Station 4494  
 566 Hegenberger Road at Edes Avenue  
 Oakland, California

Well Number	Date Sampled	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	TEPH as Diesel (ppb)	Total Oil and Grease (ppm)
MW-6 (cont.)	05/24/95	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A
	08/23/95	-----Well Sampled Annually-----						
	11/17/95	-----Well Sampled Annually-----						
MW-7	08/06/92	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A
	10/29/92	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A
	08/16/93	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A
	11/17/93	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A
	02/22/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A
	05/11/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A
	08/12/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A
	11/17/94	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A
	02/22/95	-----Well Sampled Annually-----						
	05/24/95	<50	<0.50	<0.50	<0.50	<0.50	N/A	N/A
	08/23/95	-----Well Sampled Annually-----						
11/17/95	-----Well Sampled Annually-----							
RW-1	08/16/93	NS	NS	NS	NS	NS	NS	NS
	11/17/93	NS	NS	NS	NS	NS	NS	NS
	02/22/94	280	2,100	19	40	66	N/A	N/A
	05/11/94	3,300	32	28	87	310	N/A	N/A
	08/12/94	4,600	42	59	190	400	N/A	N/A
	11/17/94	1,400	56	21	28	210	N/A	N/A
	02/22/95	8,100	140	<10	550	560	N/A	N/A
	05/24/95	940	53	0.75	11	1.4	N/A	N/A
	08/23/95	620	2.1	2.3	0.67	0.67	N/A	N/A
	11/17/95	1,100	7.6	21	46	180	N/A	N/A
ppb = Parts per billion								
ppm = Parts per million								
N/A = Not applicable								
NS = Not sampled								

Table 4  
Groundwater Analytical Data  
Total Methyl t-Butyl Ether

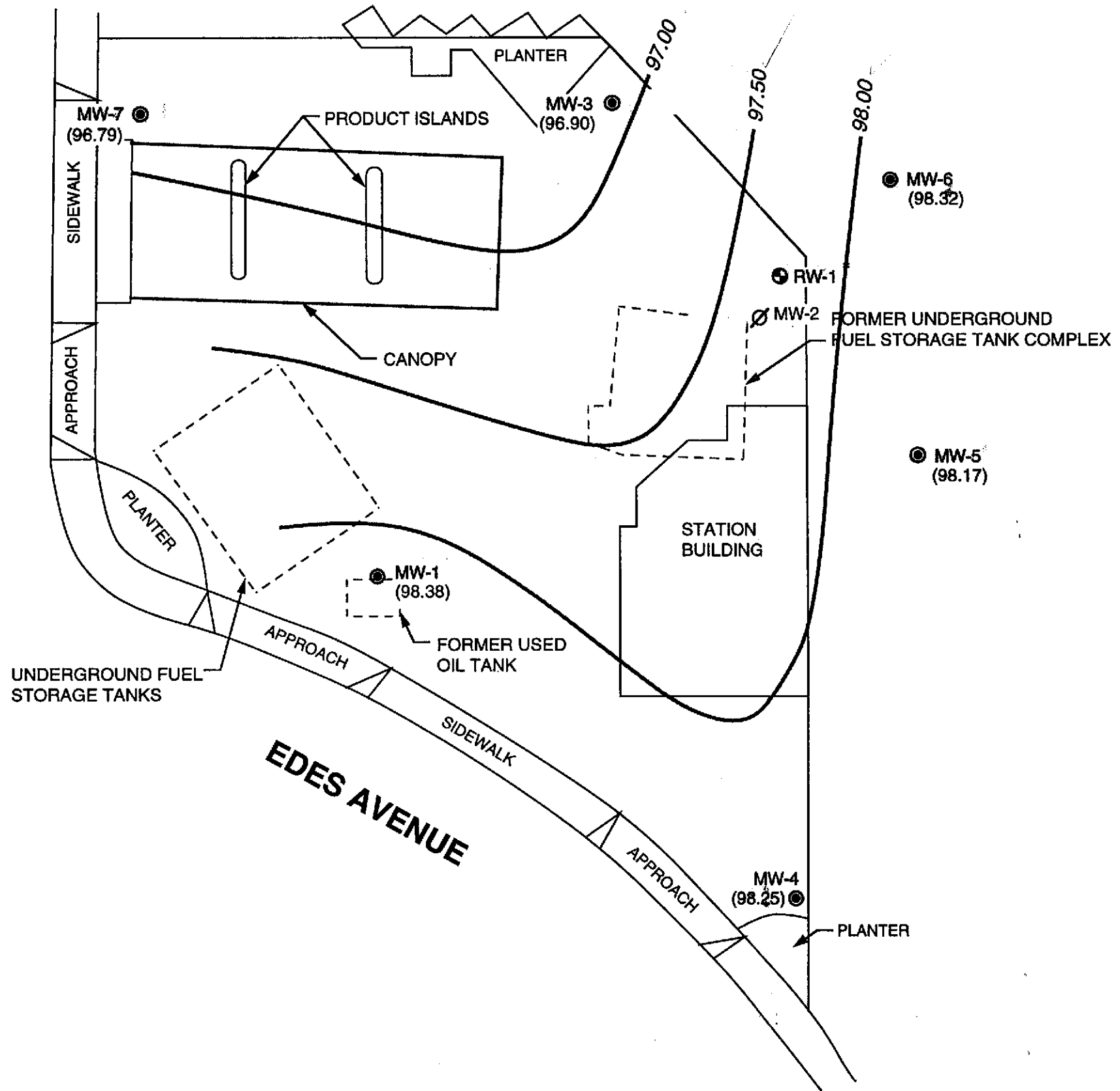
ARCO Service Station 4494  
566 Hegenberger Road at Edes Avenue  
Oakland, California

Well Number	Date Sampled	Methyl t-Butyl Ether (ppb)
MW-1	08/23/95	NS
MW-2	08/23/95	NS
MW-3	08/23/95	NS
MW-4	08/23/95	NS
MW-5	08/23/95	NS
MW-6	08/23/95	NS
MW-7	08/23/95	NS
RW-1	08/23/95	13

ppb = Parts per billion  
NS = Not sampled  
See certified analytical report for detection limit.



HEGENBERGER ROAD



**LEGEND**

- MW-6 ● GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- MW-2 ∅ DESTROYED WELL LOCATION AND DESIGNATION
- RW-1 ● GROUNDWATER EXTRACTION WELL LOCATION AND DESIGNATION

(98.38) LIQUID SURFACE ELEVATION IN FEET - MSL, 11-17-95

97.50 — LIQUID SURFACE ELEVATION CONTOUR IN FEET - 11-17-95

\* WELL NOT SURVEYED



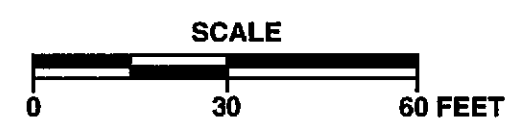
APPROXIMATE DIRECTION OF GROUNDWATER FLOW

APPROXIMATE GRADIENT = 0.016

SOURCE: MAP FROM RESNA



PACIFIC ENVIRONMENTAL GROUP, INC.



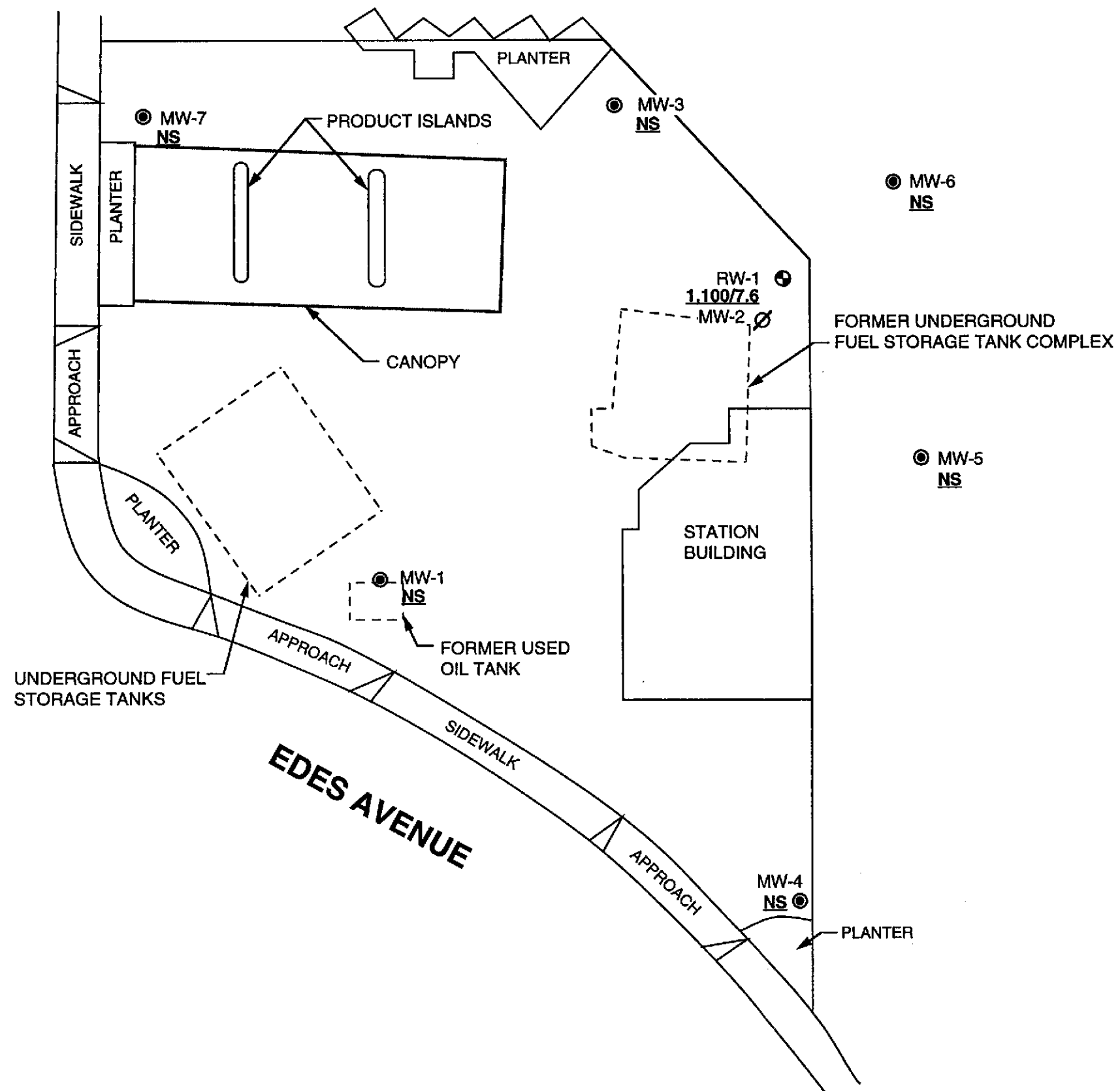
ARCO SERVICE STATION 4494  
566 Hegenberger Road at Edes Avenue  
Oakland, California

GROUNDWATER ELEVATION CONTOUR MAP

FIGURE:  
1  
PROJECT:  
330-041.2B



HEGENBERGER ROAD



**LEGEND**

- MW-6 ● GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION
- MW-2 ∅ DESTROYED WELL LOCATION AND DESIGNATION
- RW-1 ● GROUNDWATER EXTRACTION WELL LOCATION AND DESIGNATION
- 1,100/7.6 TPPH-g/BENZENE CONCENTRATION IN GROUNDWATER, IN PARTS PER BILLION, 11-17-95
- NS NOT SAMPLED

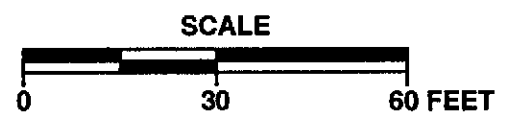


APPROXIMATE DIRECTION OF GROUNDWATER FLOW

SOURCE: MAP FROM RESNA



PACIFIC ENVIRONMENTAL GROUP, INC.



**ARCO SERVICE STATION 4494**  
 566 Hegenberger Road at Edes Avenue  
 Oakland, California

TPPH-g/BENZENE CONCENTRATION MAP

FIGURE:  
**2**  
 PROJECT:  
 330-041.2B

**ATTACHMENT A**

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



# Sequoia Analytical

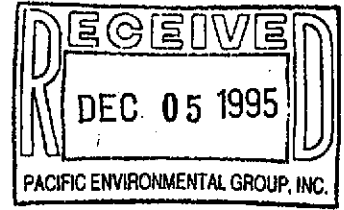
680 Chesapeake Drive  
404 N. Wiget Lane  
819 Striker Avenue, Suite 8

Redwood City, CA 94063  
Walnut Creek, CA 94598  
Sacramento, CA 95834

(415) 364-9600  
(510) 988-9600  
(916) 921-9600

FAX (415) 364-9233  
FAX (510) 988-9673  
FAX (916) 921-0100

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



Project: 330-041.2G/4494,Oakland

Enclosed are the results from samples received at Sequoia Analytical on November 20, 1995.  
The requested analyses are listed below:

<u>SAMPLE #</u>	<u>SAMPLE DESCRIPTION</u>	<u>DATE COLLECTED</u>	<u>TEST METHOD</u>
9511E85 -01	LIQUID, RW-1	11/17/95	TPHGBW Purgeable TPH/BTEX
9511E85 -02	LIQUID, TB-1	11/17/95	TPHGBW Purgeable TPH/BTEX

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

Very truly yours,

**SEQUOIA ANALYTICAL**

Bruce Fletcher  
Project Manager

Quality Assurance Department





Pacific Environmental Group	Client Proj. ID: 330-041.2G/4494,Oakland	Sampled: 11/17/95
2025 Gateway Place, Suite 440	Sample Descript: RW-1	Received: 11/20/95
San Jose, CA 95110	Matrix: LIQUID	
Attention: Maree Doden	Analysis Method: 8015Mod/8020	Analyzed: 11/22/95
	Lab Number: 9511E85-01	Reported: 12/01/95

QC Batch Number: GC112295BTEX03A  
Instrument ID: GCHP03

### Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	500	1100
Benzene	5.0	7.6
Toluene	5.0	21
Ethyl Benzene	5.0	48
Xylenes (Total)	5.0	180
Chromatogram Pattern:		Gas
Surrogates	Control Limits %	% Recovery
Trifluorotoluene	70                      130	78

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

SEQUOIA ANALYTICAL - ELAP #1210

Bruce Fletcher  
Project Manager



Pacific Environmental Group 2025 Gateway Place, Suite 440 San Jose, CA 95110 Attention: Maree Doden	Client Proj. ID: 330-041.2G/4494, Oakland Sample Descript: TB-1 Matrix: LIQUID Analysis Method: 8015Mod/8020 Lab Number: 9511E85-02	Sampled: 11/17/95 Received: 11/20/95 Analyzed: 11/22/95 Reported: 12/01/95
--	---	---

QC Batch Number: GC112295BTEX03A  
Instrument ID: GCHP03

**Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX**

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		
<b>Surrogates</b>	<b>Control Limits %</b>	<b>% Recovery</b>
Trifluorotoluene	70 130	84

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

**SEQUOIA ANALYTICAL - ELAP #1210**

*B Fletcher*

Brucie Fletcher  
Project Manager



# Sequoia Analytical

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

Pacific Environmental Group Client Project ID: 330-041.2G/4494, Oakland  
 2025 Gateway Place, Suite 440 Matrix: LIQUID  
 San Jose, CA 95110  
 Attention: Maree Doden Work Order #: 9511E85 01, 02 Reported: Dec 4, 1995

## QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC112295BTEX03A	GC112295BTEX03A	GC112295BTEX03A	GC112295BTEX03A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030

Analyst:	J. Woo	J. Woo	J. Woo	J. Woo
MS/MSD #:	9511B2702	9511B2702	9511B2702	9511B2702
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	11/22/95	11/22/95	11/22/95	11/22/95
Analyzed Date:	11/22/95	11/22/95	11/22/95	11/22/95
Instrument I.D.#:	GCHP3	GCHP3	GCHP3	GCHP3
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	11	11	11	32
MS % Recovery:	110	110	110	107
Dup. Result:	9.9	9.6	9.5	29
MSD % Recov.:	99	96	95	97
RPD:	11	14	15	9.8
RPD Limit:	0-50	0-50	0-50	0-50

LCS #:	BLK112295	BLK112295	BLK112295	BLK112295
Prepared Date:	11/22/95	11/22/95	11/22/95	11/22/95
Analyzed Date:	11/22/95	11/22/95	11/22/95	11/22/95
Instrument I.D.#:	GCHP3	GCHP3	GCHP3	GCHP3
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	11	11	10	32
LCS % Recov.:	110	110	100	107

MS/MSD LCS Control Limits	71-133	72-128	72-130	71-120
---------------------------	--------	--------	--------	--------

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

**Please Note:**

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

SEQUOIA ANALYTICAL

*B. Fletcher*  
 Bruce Fletcher  
 Project Manager

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

9511E85.PPP <1>

SEQUOIA ANALYTICAL SAMPLE RECEIPT LOG

CLIENT NAME: Pacific Environmental  
 REC. BY (PRINT): PL

WORKORDER: 9511E85  
 DATE OF LOG-IN: 11-21-95

CIRCLE THE APPROPRIATE RESPONSE		LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION(ETC.)
1. Custody Seal(s)	Present / <del>Absent</del> Intact / Broken*	1	AC	RW - 1	VOA (2)	liquid	11/17/95	
2. Custody Seal Nos.:	Put in Remarks Section	2	AB	TB - 1	VOA (2)	↓	↓	
3. Chain-of-Custody Records:	<del>Present</del> / Absent*							
4. Traffic Reports or Packing List:	Present / <del>Absent</del>							
5. Airbill:	Airbill / Sticker Present / <del>Absent</del>							
6. Airbill No.:								
7. Sample Tags:	<del>Present</del> / Absent*							
8. Sample Condition:	<del>Intact</del> / Broken* / Leaking*							
9. Does information on custody reports, traffic reports and sample tags agree?	<del>Yes</del> / No*							
10. Proper preservatives used:	<del>Yes</del> / No*							
11. Date Rec. at Lab:	<u>11/20/95</u>							
12. Temp. Rec. at Lab:	<u>11°C</u>							
13. Time Rec. at Lab:	<u>11:50</u>							

*Handwritten note:* FILE 11/20/95

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

RCO Facility no. 4494 City (Facility) OAKLAND CA. Project manager (Consultant) Kelly Brown  
 RCO engineer Mike Whelan Telephone no. (ARCO) Telephone no. (Consultant) 408 441 7790 Fax no. (Consultant) 408 441 7539  
 Consultant name Pacific Environmental Address (Consultant) 2025 GATEWAY PL #440 SAN JOSE

Laboratory name  
SCOVAIA  
Contract number

Sample I.D.	Lab no.	Container no.	Matrix			Preservation		Sampling date	Sampling time	PW BTEX EPA 802/EPA 8020	GAS BTEX/TPH EPA 802/EPA 8020/8015	TPH Modified 8015 Gas Diesel	Oil and Grease 413.1 413.2	TPH EPA 418.1/SM4503E	EPA 801/8010	EPA 824/8240	EPA 825/8270	TCLP Metals VOA VOA	Semi Metals VOA VOA	CAM Metals EPA 8010/7000 TLC STLC	Lead Org./OHS Lead EPA 7420/7421	
			Soil	Water	Other	Ice	Acid															
2W-1	1	3		X		YES	HCL	11-17-95	10:20	X	X											
B-1	2	2		X		YES	HCL	11-17-95	N/A	X	X											

Method of shipment  
95/11E85

Special detection  
Limit/reporting

Special QA/QC

Remarks

Lab number

Turnaround time

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

Condition of sample: \_\_\_\_\_ Temperature received: \_\_\_\_\_

Inquired by <i>Paul Winkler</i>	Date 11-17-95	Time 14:00	Received by <i>AD</i>	Date 10/17/95
Inquired by <i>AD</i>	Date 11/20/95	Time 1030	Received by <i>AD</i>	Date 11/20/95
Inquired by <i>AD</i>	Date 11/20/95	Time	Received by laboratory <i>AD</i>	Date 11/20/95 Time 11:50

## FIELD REPORT

(TO WATER/SEPARATE-PHASE HYDROCARBON SURVEY)

PROJECT No.: 330 041 26 LOCATION: 566 Hegeburger Oaks DATE: 11-17-95  
 CLIENT/STATION NO.: 4494 FIELD TECHNICIAN: PW DAY OF WEEK: FRI

PROBE TYPE/ID No.  
 Oil/Water IF/ \_\_\_\_\_  
 H<sub>2</sub>O level indicator +2  
 Other: \_\_\_\_\_

D/w Order	Well ID	Time	Surface Seal	Lid Secure	Gasket	Lock	Expanding Cap	TOC Total Depth (feet)	First Depth to Water (feet) TOB/TOC	Second Depth to Water (feet) TOB/TOC	SEPARATE-PHASE HYDROCARBONS (SPH)										
											SPH Depth (feet) TOB/TOC	SPH Thickness (feet)	Fresh	Weathered	Gas	Oil	VISCOSITY			LIQUID REMOVED (gallons) SPH / H <sub>2</sub> O	
																	Light	Medium	Heavy		
	MW1	9:47	✓	✓	✓	✓	✓	23.67	7.72 7.72	7.80 7.80											
	MW3	9:43	✓	✓	✓	✓	✓	18.09	9.59 9.39	9.95 9.95											
	MW4	9:52	✓	✓	✓	✓	✓	17.04	9.15 9.15	9.50 9.50											
	MW5	9:34	✓	✓	✓	✓	✓	17.10	7.02 7.02	8.17 8.17											
	MW6	9:38	✓	✓	✓	✓	✓	18.07	6.75 6.75	7.62 7.62											
	MW7	9:56	✓	✓	✓	✓	✓	14.61	8.73 8.73	9.17 9.17											
	RW-1	10:00	✓	✓	✓	✓	✓	11.56	9.15 9.15	9.85 9.85											

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**FIELD DATA SHEET**

**WATER SAMPLE FIELD DATA SHEET**

PROJECT No.: 330 041 26 LOCATION: Slab Hegenburger On Ward WELL ID #: RW-1

CLIENT/STATION No.: 4494 FIELD TECHNICIAN: PLW

WELL INFORMATION

Depth to Liquid:        TOB        TOC         
 Depth to water: 9.85 TOB 9.15 TOC         
 Total depth:        TOB 11.56 TOC         
 Date: 11-17-95 Time (2400): 10:00

Probe Type and I.D. #  
 Oil/Water interface  
 Electronic indicator 82  
 Other:       

CASING  
DIAMETER      GAL/  
                          LINEAR FT.

<input checked="" type="checkbox"/>	2	0.17
<input type="checkbox"/>	3	0.38
<input type="checkbox"/>	4	0.66
<input type="checkbox"/>	4.5	0.83
<input type="checkbox"/>	5	1.02
<input type="checkbox"/>	6	1.5
<input type="checkbox"/>	8	2.6

SAMPLE TYPE

<input checked="" type="checkbox"/>	Groundwater
<input type="checkbox"/>	Duplicate
<input type="checkbox"/>	Extraction well
<input type="checkbox"/>	Trip blank
<input type="checkbox"/>	Field blank
<input type="checkbox"/>	Equipment blank
<input type="checkbox"/>	Other: <u>      </u>

TD 11.56 - DTW 9.15 = 2.41 Gal/Linear Foot .17 = .40 x Number of Casings 3 = Calculated Purge 1.22

DATE PURGED: 11-17-95 START: 10:02 END (2400 hr): 10:10 PURGED BY: PLW  
 DATE SAMPLED: 11-17-95 START: 10:10 END (2400 hr): 10:20 SAMPLED BY: PLW

TIME (2400 hr)	VOLUME (gal.)	pH (units)	E.C. (umhos/cm @ 25°C)	TEMPERATURE (°F)	COLOR	TURBIDITY	ODOR
<u>10:06</u>	<u>.50</u>	<u>7.44</u>	<u>720,000</u>	<u>66.4</u>	<u>Brown</u>	<u>High</u>	<u>Strong</u>
<u>10:08</u>	<u>1.0</u>	<u>7.38</u>	<u>720,000</u>	<u>66.3</u>	<u>Brown</u>	<u>High</u>	<u>↓</u>
<u>10:10</u>	<u>1.5</u>	<u>7.31</u>	<u>720,000</u>	<u>64.9</u>	<u>Brown</u>	<u>High</u>	<u>↓</u>

Pumped dry Yes  No

Cobalt 0-100 Clear Cloudy Yellow Brown	NTU 0-200 Heavy Moderate Light Trace	Strong Moderate Faint None
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FIELD MEASUREMENTS AT TIME OF SAMPLE, AFTER RECHARGE:

DTW:        TOB/TOC       

PURGING EQUIPMENT/I.D. #

Bailer: 23-1       Airlift Pump:         
 Centrifugal Pump:              Dedicated:         
 Other:       

SAMPLING EQUIPMENT/I.D. #

Bailer: 23-1  
 Dedicated:         
 Other:       

SAMP. CNTRL #	DATE	TIME (2400)	No. of Cont.	SIZE	CONTAINER	PRESERVE	ANALYTICAL PARAMETER
<u>RW-1</u>	<u>11-17-95</u>	<u>10:20</u>	<u>3</u>	<u>10ml</u>	<u>101A</u>	<u>ACC</u>	<u>Cross Bldg</u>

REMARKS:

**ATTACHMENT B**  
**FIELD AND LABORATORY PROCEDURES**