



BP OIL

BP Oil Company
Environmental Resources Management
Building 13, Suite N
295 SW 41st Street
Renton, Washington 98055-4931
(206) 251-0667

August 8, 1994

Alameda County Health Care Services Agency
Division of Hazardous Materials
Attention Ms. Juliet Shin
1131 Harbor Bay Parkway, Ste. 250
Alameda, CA 94502

RE: **BP Oil Site No. 11104**
Buena Vista & Webster
Alameda, CA

Dear Ms. Shin:

Enclosed please find a report entitled Groundwater Monitoring and Sampling Report, dated June 8, 1994. Note that we will be resurveying the top-of-casing elevation of well RW-1 in order to check the orientation of the groundwater surface as depicted in the potentiometric surface map. We also believe that it may be useful to perform at least one quarterly monitoring event with the Chevron station located on Buena Vista Avenue. Please provide a contact name at Chevron so that we can coordinate this work.

Upon review of the data, you will note that fuel constituent concentrations have not exceeded California Maximum Contaminant Levels in monitoring wells MW-2,3,4 and 5. Accordingly, we plan to modify the sampling regime and sample these wells on a semi-annual basis. We will, however, continue to monitor groundwater elevations on a quarterly basis. If this approach presents any concerns to the County, please advise at your earliest convenience. I can be reached at (206) 251-0689.

Sincerely,

Scott T. Hooton
Environmental Resources Management

attachment

cc: site file
B. Nagle - Alisto
Mr. E. So, CRWQCB-SFBR, 2101 Webster Street, Ste. 500,
Oakland, CA 94612

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AUG 12 1994
ENVIRONMENTAL RESOURCES MANAGEMENT

GROUNDWATER MONITORING AND SAMPLING REPORT

**BP Oil Company Service Station No. 11104
1716 Webster Street
Alameda, California**

Project No. 10-155-01-004

BP OIL CO
ENVIRONMENTAL DEPT

Prepared for:

**BP Oil Company
Environmental Resources Management
295 S.W. 41st Street
Building 13, Suite N
Renton, Washington 98055**

Prepared by:

**Alisto Engineering Group
1777 Oakland Boulevard, Suite 200
Walnut Creek, California**

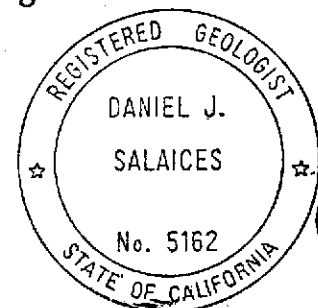
June 7, 1994

William Howell

**William Howell
Project Manager**

Daniel Salaices

**Daniel Salaices
Registered Geologist**



GROUNDWATER MONITORING AND SAMPLING REPORT

BP Oil Company Service Station No. 11104
1716 Webster Street
Alameda, California

Project No. 10-155-01-004

June 7, 1994

INTRODUCTION

This report presents the results and findings of the April 26, 1994 groundwater monitoring and sampling conducted by Alisto Engineering Group at BP Oil Company Service Station No. 11104, 1716 Webster Street, Alameda, California. A site vicinity map is shown in Figure 1.

FIELD PROCEDURES

Field activities were performed in accordance with the procedures and guidelines of the Alameda County Health Care Services Agency and the California Regional Water Quality Control Board, San Francisco Bay Region.

Before purging and sampling, the groundwater level in each well was measured from a permanent mark on top of the casing to the nearest 0.01 foot using an electronic sounder. The depth to groundwater and top of casing elevation data were used to calculate the groundwater elevation in each well. The survey data and groundwater elevation measurements collected to date are presented in Table 1.

Before sample collection, each well was purged of 3 casing volumes, while recording field readings of pH, temperature, and electrical conductivity. Groundwater samples were collected for laboratory analysis by lowering a bottom-fill, disposable bailer to just below the water level in the well. The samples were transferred from the bailer into laboratory-supplied containers. The water sampling field survey forms are presented in Appendix A.

SAMPLING AND ANALYTICAL RESULTS

The results of monitoring and laboratory analysis of the groundwater samples for this and previous quarters are summarized in Table 1. The potentiometric groundwater elevations as interpreted from the results of this monitoring event are shown in Figure 2. The results of groundwater analysis are shown in Figure 3. The laboratory report and chain of custody record are presented in Appendix B.



TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
 BP OIL COMPANY SERVICE STATION NO. 11104
 1716 WEBSTER STREET, ALAMEDA, CALIFORNIA

ALISTO PROJECT NO. 10-155

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	DO (ppm)	LAB
MW-1	07/21/92	8.51	5.91	2.60	34000	7000	1700	2500	6900	---	---
MW-1	10/20/92	8.51	6.66	1.85	---	---	---	---	---	---	---
MW-1	03/05/93	8.51	4.56	3.95	---	---	---	---	---	---	---
MW-1	04/01/93	8.51	4.57	3.94	---	---	---	---	---	---	---
MW-1	07/09/93	8.51	5.25	3.26	77000	15000	1400	2100	7400	---	PACE
QC-1 (c)	07/09/93	---	---	---	79000	16000	1500	2200	7700	---	PACE
MW-1	10/08/93	8.51	6.01	2.50	42000	7100	270	2700	4700	---	PACE
MW-1	01/06/94	8.51	6.24	2.27	45000	12000	4300	3000	6700	---	PACE
MW-1	04/26/94	8.51	5.26	3.25	39000	6500	500	1800	1200	6.3	PACE
MW-2	07/21/92	9.41	6.44	2.97	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---
MW-2	10/20/92	9.41	7.39	2.02	---	---	---	---	---	---	---
MW-2	03/05/93	9.41	4.91	4.50	---	---	---	---	---	---	---
MW-2	04/01/93	9.41	4.92	4.49	---	---	---	---	---	---	---
MW-2	07/09/93	9.41	5.60	3.81	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	PACE
MW-2	10/08/93	9.41	6.50	2.91	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	PACE
QC-1 (c)	10/08/93	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	PACE
MW-2	01/06/94	9.41	6.25	3.16	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	PACE
MW-2	04/26/94	9.41	5.73	3.68	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	7.5	PACE
MW-3 (d)	07/21/92	9.91	7.07	2.84	ND<50	0.95	ND<0.5	ND<0.5	ND<0.5	---	---
MW-3	10/20/92	9.91	8.06	1.85	---	---	---	---	---	---	---
MW-3	03/05/93	9.91	5.16	4.75	---	---	---	---	---	---	---
MW-3	04/01/93	9.91	5.25	4.66	---	---	---	---	---	---	---
MW-3	07/09/93	9.91	5.80	4.11	ND<50	0.6	ND<0.5	ND<0.5	ND<0.5	---	PACE
MW-3	10/08/93	9.91	7.17	2.74	ND<50	0.6	ND<0.5	ND<0.5	ND<0.5	---	PACE
MW-3	01/06/94	9.91	6.94	2.97	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	---	PACE
MW-3	04/26/94	9.91	6.18	3.73	ND<50	ND<50	ND<0.5	ND<0.5	ND<0.5	3.1	PACE
MW-4	03/05/93	8.33	4.81	3.52	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---
MW-4	04/01/93	8.33	4.80	3.53	---	---	---	---	---	---	---
MW-4	07/09/93	8.33	5.54	2.79	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	PACE
MW-4	10/08/93	8.33	6.28	2.05	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	PACE
MW-4	01/06/94	8.33	5.82	2.51	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	PACE
MW-4	04/26/94	8.33	5.50	2.83	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	7.4	PACE

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
 BP OIL COMPANY SERVICE STATION NO. 11104
 1716 WEBSTER STREET, ALAMEDA, CALIFORNIA

ALISTO PROJECT NO. 10-155

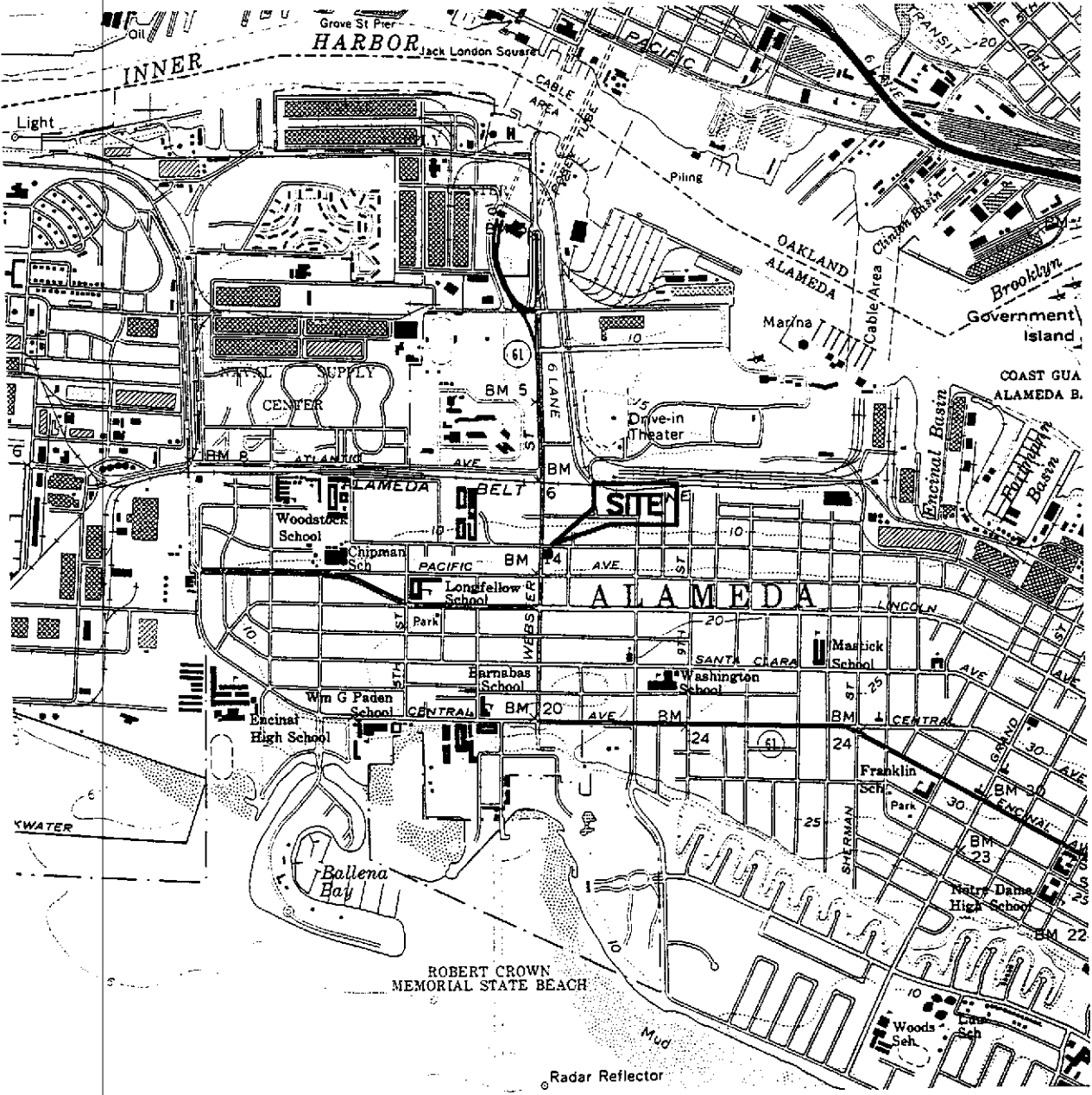
WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a) (Feet)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (b) (Feet)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	DO (ppm)	LAB
MW-5	04/01/93	8.17	4.77	3.40	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	---
MW-5	07/09/93	8.17	5.40	2.77	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	PACE
MW-5	10/08/93	8.17	5.87	2.30	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	PACE
MW-5	01/06/94	8.17	5.75	2.42	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	PACE
MW-5	04/26/94	8.17	5.49	2.68	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	7.1	PACE
RW-1	01/06/94	8.37	5.59	2.78	23000	3800	210	840	2100	---	PACE
QC-1 (c)	01/06/94	---	---	---	24000	3700	210	830	2000	---	PACE
RW-1	04/26/94	8.37	5.21	3.16	24000	3500	120	800	1700	6.4	PACE
QC-1 (c)	04/26/94	---	---	---	22000	3300	110	700	1700	---	PACE
QC-2 (e)	07/09/93	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	PACE
QC-2 (e)	10/08/93	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	PACE
QC-2 (e)	01/06/94	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	PACE
QC-2 (e)	04/26/94	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	---	PACE

ABBREVIATIONS:

TPH-G	Total petroleum hydrocarbons as gasoline
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total xylenes
DO	Dissolved oxygen
ppb	Parts per billion
ppm	Parts per million
---	Not analyzed/available/applicable
ND	Not detected above reported detection limit
PACE	Pace, Inc.

NOTES:

- (a) Top of casing elevations surveyed in reference to USGS benchmark (7.68 feet above mean sea level) at northwest corner of Webster Street and Buena Vista Avenue.
- (b) Groundwater elevations in feet above mean sea level.
- (c) Blind duplicate.
- (d) Sample also analyzed for cadmium, nickel, chromium, lead, and zinc. None were detected above the reported detection limit.
- (e) Travel blank.



SOURCE:
 USGS MAP, OAKLAND WEST QUADRANGLE,
 CALIFORNIA. 7.5 MINUTE SERIES. 1959.
 PHOTOREVISED 1980.

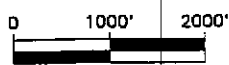
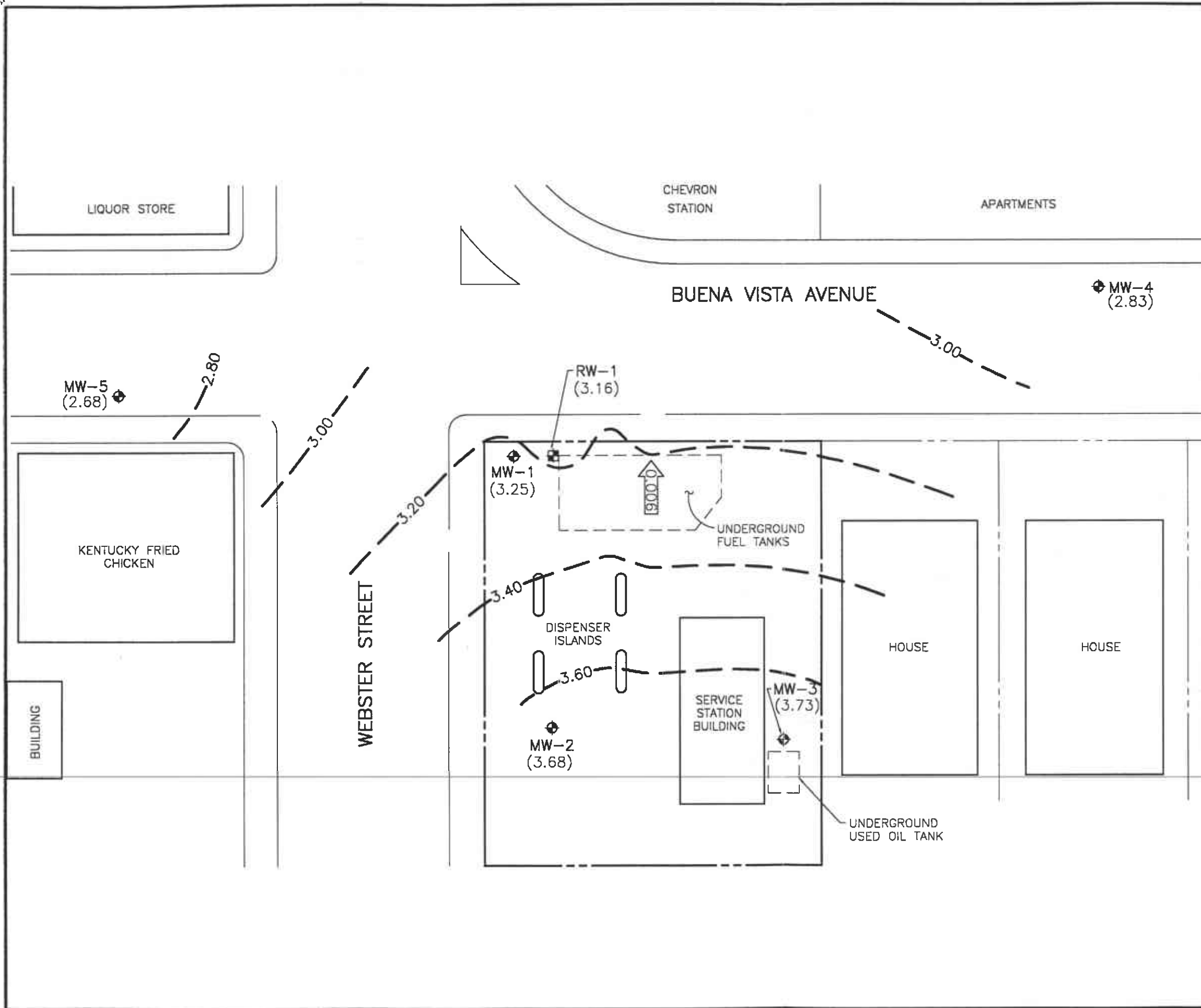


FIGURE 1
SITE VICINITY MAP

BP OIL SERVICE STATION NO. 11104
 1716 WEBSTER STREET
 ALAMEDA, CALIFORNIA
 PROJECT NO. 10-155

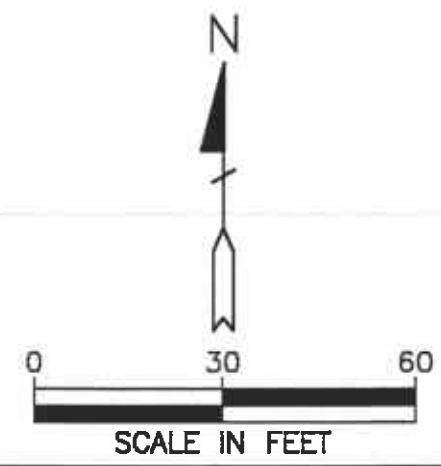
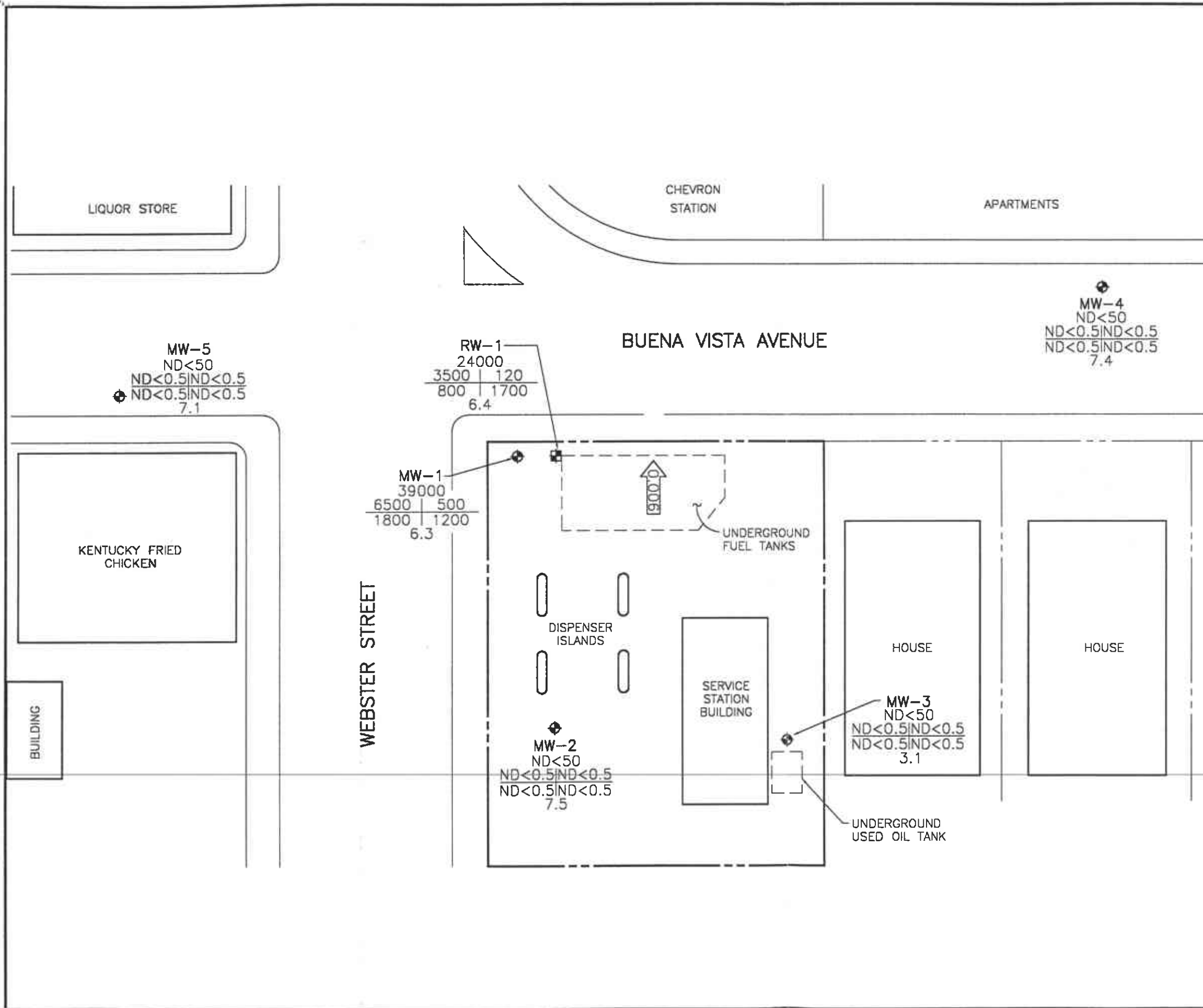




LEGEND

- ◆ GROUNDWATER MONITORING WELL
- ⊠ GROUNDWATER RECOVERY WELL
- (2.83) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- 3.00 - GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL-0.20 FOOT)
- ← 0.006 CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 2
POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP
APRIL 26, 1994
 BP OIL SERVICE STATION NO. 11104
 1716 WEBSTER STREET
 ALAMEDA, CALIFORNIA
 PROJECT NO. 10-155



LEGEND

- ◆ GROUNDWATER MONITORING WELL
- ⊕ GROUNDWATER RECOVERY WELL
- TPH-G
B | T
E | X
DO
CONCENTRATION OF CONSTITUENTS IN PARTS PER BILLION, EXCEPT DISSOLVED OXYGEN, WHICH IS IN PARTS PER MILLION
- TPH-G
TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
- B
BENZENE
- T
TOLUENE
- E
ETHYLBENZENE
- X
TOTAL XYLENES
- DO
DISSOLVED OXYGEN
- ND
NOT DETECTED ABOVE REPORTED DETECTION LIMIT
- ← 0.006
CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 3
CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER
APRIL 26, 1994
 BP OIL SERVICE STATION NO. 11104
 1716 WEBSTER STREET
 ALAMEDA, CALIFORNIA
 PROJECT NO. 10-155

10135E-1.DWG REV 1-94 14-3-94 10:23:11

APPENDIX A
WATER SAMPLING FIELD SURVEY FORMS

ALISTO ENGINEERING GROUP GROUNDWATER MONITORING

Client: BP
 Alisto Project No: 10-155-1-4
 Service Station No: 11104

Date: 9/26/94
 Field Personnel: DC
 Site Address: Alameda

FIELD ACTIVITY:

- Groundwater Monitoring
- Groundwater Sampling
- Well Development

QUALITY CONTROL SAMPLES:

- RW-1 QC-1 Sample Duplicate (Well ID)
- QC-2 Trip Blank
- QC-3 Rinsate Blank

Well ID	Well Diam	Order Measured/ Sampled	Total Depth	Depth to Water	Depth to Product	Product Thick-ness	Comments
MW1	2"	5	16.88	5.26			
MW2	2"	4	15.52	5.73			
MW3	2"	3	17.00	6.18			
MW4	2"	2	15.90	5.50			
MW5	2"	1	11.94	5.49			
RW1	6"	6	21.61	5.21			

Notes:

ALISTO ENGINEERING GROUP

Groundwater Development and Sampling Form

Client: BP
 Alisto Project No: 10-155-1-4
 Service Station No: 11104

Date: 4/26/94
 Field Personnel: DC
 Address: Alameda

Well ID: MW1 Field Activity: Well Development Well Sampling Product Bailing

Casing Diameter:

- 2 Inch (0.16 Gal/foot)
- 3 Inch (0.37 Gal/foot)
- 4 Inch (0.65 Gal/foot)
- 4.5 Inch (0.83 Gal/foot)
- 6 Inch (1.47 Gal/foot)

Purge Method:

- Pump (dispos. Poly Tubing)
- Disposable Bailers
- Other
- 1.66 PVC Standard Bailer
- 3.50 PVC Standard Bailer

Well Data:

- Depth to Product
- Product Thickness
- 5.26 Depth to Water

Sampling Method:

- Disposable Bailer
- Pump

Decontamination Method:

- Triple Rinse (Liquinox)
- Steam Cleaned

Calculated Purge Volume

$$\frac{16.88 - 5.26}{11.62 \text{ ft} \times 1.16 \text{ Gal/Ft}} = 1.86 \text{ Gal} \times 3 = 5.58$$

Total Depth of Well Depth to Water Water Column Conversion Factor Casing Vol Vols to Purge Total Volume

Well Development/Sampling Parameters

Time	Temp °F	pH	Cond. (umhos/cm)	Purge Vol (Gal)	Comments/Turbidity	Analysis Required	Container Type	Preserv
	72.7	7.37	1.32	2	cloudy white	TPH-G/BTEX	VOA	HCL
	72.8	7.59	1.43	4	↓	TPH-Diesel	Amber Liter	Solvent Rinsed
	72.8	7.67	1.42	6		EPA 601	VOA	
						TOG 5520BF	Amber Liter	H ₂ SO ₄

DO₂ begin 6.8
 end 6.3

ALISTO ENGINEERING GROUP

Groundwater Development and Sampling Form

Client: BP
 Alisto Project No: 10-155-1-4
 Service Station No: 11104

Date: 4/26/94
 Field Personnel: DC
 Address: Alvarado

Well ID: MW 2 Field Activity: Well Development Well Sampling Product Bailing

Casing Diameter:

- 2 Inch (0.16 Gal/foot)
 3 Inch (0.37 Gal/foot)
 4 Inch (0.65 Gal/foot)
 4.5 Inch (0.83 Gal/foot)
 6 Inch (1.47 Gal/foot)

Purge Method:

- Pump (dispos. Poly Tubing)
 Disposable Bailers
 Other
 1.66 PVC Standard Bailer
 3.50 PVC Standard Bailer

Well Data:

Depth to Product
 Product Thickness
5.73 Depth to Water

Sampling Method:

- Disposable Bailer
 Pump

Decontamination Method:

- Triple Rinse (Liquinox)
 Steam Cleaned

Calculated Purge Volume

$$\frac{15.52 - 5.73}{9.79 \text{ ft} \times .16 \text{ Gal/Ft}} = \frac{1.57 \text{ Gal} \times 3}{\text{Casing Vol Vols to Purge}} = 4.70 \text{ Total Volume}$$

Well Development/Sampling Parameters

Time	Temp °F	pH	Cond. (umhos/cm)	Purge Vol (Gal)	Comments/Turbidity	Analysis Required	Container Type	Preserv
	70.0	6.8	0.84	2	too cloudy	TPH-G/BTEX	VOA	HCL
	70.9	7.0	0.82	4	↓	TPH-Diesel	Amber Liter	Solvent Rinsed
	70.8	7.94	0.77	5	↓	EPA 601	VOA	
						TOG 5520BF	Amber Liter	H ₂ SO ₄

DO₂ begin end 4.2 7.5

ALISTO ENGINEERING GROUP

Groundwater Development and Sampling Form

Client: BP
 Alisto Project No: 10-155-1-4
 Service Station No: 11104

Date: 4/26/94
 Field Personnel: DC
 Address: Alameda

Well ID: MW3 Field Activity: Well Development Well Sampling Product Bailing

Casing Diameter:

- 2 Inch (0.16 Gal/foot)
- 3 Inch (0.37 Gal/foot)
- 4 Inch (0.65 Gal/foot)
- 4.5 Inch (0.83 Gal/foot)
- 6 Inch (1.47 Gal/foot)

Purge Method:

- Pump (dispos. Poly Tubing)
- Disposable Bailers
- Other
- 1.66 PVC Standard Bailer
- 3.50 PVC Standard Bailer

Well Data:

- Depth to Product
- Product Thickness
- 6.7 Depth to Water

Sampling Method:

- Disposable Bailer
- Pump

Decontamination Method:

- Triple Rinse (Liquinox)
- Steam Cleaned

Calculated Purge Volume = $\frac{17.00 - 6.18}{10.82 \text{ ft} \times 1.6 \text{ Gal/Ft}} = 1.73 \text{ Gal} \times 3 = 5.19$

Total Depth of Well	Depth to Water	Water Column	Conversion Factor	Casing Vol	Vols to Purge	Total Volume
---------------------	----------------	--------------	-------------------	------------	---------------	--------------

Well Development/Sampling Parameters

Time	Temp °F	pH	Cond. (umhos/cm)	Purge Vol (Gal)	Comments/Turbidity	Analysis Required	Container Type	Preserv
	65.4	6.90	0.71	2	cloudy tan	TPH-G/BTEX	VOA	HCL
	65.1	6.87	0.73	4	↓	TPH-Diesel	Amber Liter	Solvent Rinsed
	64.5	6.94	0.73	5.25	↓	EPA 601	VOA	
						TOG 5520BF	Amber Liter	H ₂ SO ₄

* now x 1,000 for this & rest of conductivity *

DO₂ begin → 2.5
 end → 3.1

ALISTO ENGINEERING GROUP

Groundwater Development and Sampling Form

Client: BP
 Alisto Project No: 10-155-1-4
 Service Station No: 11104

Date: 4/26/94
 Field Personnel: DC
 Address: Alameda

Well ID: MW4 Field Activity: Well Development Well Sampling Product Bailing

Casing Diameter:

- 2 Inch (0.16 Gal/foot)
- 3 Inch (0.37 Gal/foot)
- 4 Inch (0.65 Gal/foot)
- 4.5 Inch (0.83 Gal/foot)
- 6 Inch (1.47 Gal/foot)

Purge Method:

- Pump (dispos. Poly Tubing)
- Disposable Bailers
- Other
- 1.66 PVC Standard Bailer
- 3.50 PVC Standard Bailer

Well Data:

- Depth to Product
- Product Thickness
- 5.50 Depth to Water

Sampling Method:

- Disposable Bailer
- Pump

Decontamination Method:

- Triple Rinse (Liquinox)
- Steam Cleaned

Calculated Purge Volume

$$\frac{15.90 - 5.50}{10.4 \text{ ft} \times 1.66 \text{ Gal/Ft}} = 1.66 \text{ Gal} \times 3 = 4.99$$

Total Depth of Well Depth to Water Water Column Conversion Factor Casing Vol Vols to Purge Total Volume

Well Development/Sampling Parameters

Time	Temp °F	pH	Cond. (umhos/cm)	Purge Vol (Gal)	Comments/Turbidity	Analysis Required	Container Type	Preserv
	68.7	7.48	4.31	2	Under ^{tan} white	TPH-G/BTEX	VOA	HCL
	69.3	7.89	4.12	4	↓	TPH-Diesel	Amber Liter	Solvent Rinsed
	69.7	8.06	4.06	5	clear	EPA 601	VOA	
						TOG 5520BF	Amber Liter	H ₂ SO ₄

* note X 100 for conductivity

DO₂ begin → 6.7
 end → 7.4

ALISTO ENGINEERING GROUP

Groundwater Development and Sampling Form

Client: BP
 Alisto Project No: 10-155-1-4
 Service Station No: 11104

Date: 1/26/94
 Field Personnel: DC
 Address: Alameda

Well ID: MWS Field Activity: Well Development Well Sampling Product Bailing

Casing Diameter:
 2 Inch (0.16 Gal/foot)
 3 Inch (0.37 Gal/foot)
 4 Inch (0.65 Gal/foot)
 4.5 Inch (0.83 Gal/foot)
 6 Inch (1.47 Gal/foot)

Purge Method:
 Pump (dispos. Poly Tubing)
 Disposable Bailers
 Other
 1.66 PVC Standard Bailer
 3.50 PVC Standard Bailer

Well Data:
 Depth to Product
 Product Thickness
 5.75 Depth to Water

Sampling Method:
 Disposable Bailer
 Pump

Decontamination Method:
 Triple Rinse (Liquinox)
 Steam Cleaned

Calculated Purge Volume

$$\frac{14.94}{14.94} - \frac{5.45}{5.45} = 9.45 \text{ ft} \times .16 \text{ Gal/Ft} = 1.51 \text{ Gal} \times \frac{3}{3} = 4.54$$

Total Depth of Well Depth to Water Water Column Conversion Factor Casing Vol Vols to Purge Total Volume

Well Development/Sampling Parameters

Time	Temp °F	pH	Cond. (umhos/cm)	Purge Vol (Gal)	Comments/Turbidity	Analysis Required	Container Type	Preserv.
	73.5	6.74	7.52	2	Brown	TPH-G/BTEX	VOA	HCL
	70.3	6.88	7.26	4		TPH-Diesel	Amber Liter	Solvent Rinsed
	69.3	7.66	6.83	5	↓	EPA 601	VOA	
						TOG 5520BF	Amber Liter	H ₂ SO ₄

* note x 100 for conductivity

DO2 begin → 4.2
 and → 7.1

ALISTO ENGINEERING GROUP

Groundwater Development and Sampling Form

Client: BP
 Alisto Project No: 10-155-44
 Service Station No: 1104

Date: 4/26/94
 Field Personnel: DC
 Address: Alameda

Well ID: AW-1 Field Activity: Well Development Well Sampling Product Bailing

Casing Diameter:

- 2 Inch (0.16 Gal/foot)
 3 Inch (0.37 Gal/foot)
 4 Inch (0.65 Gal/foot)
 4.5 Inch (0.83 Gal/foot)
 6 Inch (1.47 Gal/foot)

Purge Method:

- Pump (dispos. Poly Tubing)
 Disposable Bailers
 Other
 1.66 PVC Standard Bailer
 3.50 PVC Standard Bailer

Well Data:

- Depth to Product
 Product Thickness
 5.21 Depth to Water

Sampling Method:

- Disposable Bailer
 Pump

Decontamination Method:

- Triple Rinse (Liquinox)
 Steam Cleaned

Calculated Purge Volume

$$\frac{21.61}{5.21} = \frac{16.4 \text{ ft} \times 1.47 \text{ Gal/Ft}}{\text{Water Conversion Column Factor}} = \frac{24.11 \text{ Gal} \times 3}{\text{Casing Vol Vols to Purge}} = \frac{72.32}{\text{Total Volume}}$$

Well Development/Sampling Parameters

Time	Temp °F	pH	Cond. (umhos /cm)	Purge Vol (Gal)	Comments/ Turbidity	Analysis Required	Container Type	Preserv
	71.3	7.54	1.08	25	cloudy tan	TPH-G/BTEX	VOA	HCL
	68.9	7.38	1.06	50	↓	TPH-Diesel	Amber Liter	Solvent Rinsed
	68.8	7.34	1.05	75	↓	EPA 601	VOA	
						TOG 5520BF	Amber Liter	H ₂ SO ₄

* QCL

DO₂ begin - 6.2
 end - 6.4

APPENDIX B

LABORATORY REPORT AND CHAIN OF CUSTODY RECORD



REPORT OF LABORATORY ANALYSIS

Alisto Engineering Group
1777 Oakland Blvd., Ste. 200
Walnut Creek, CA 94596

May 06, 1994
PACE Project Number: 440428507

Attn: Mr. Bill Howell

Client Reference: BP Site #11104/CP#10-155-01-004

PACE Sample Number:

70 0312361

Date Collected:

04/26/94

Date Received:

04/28/94

Client Sample ID:

MW-1

Parameter

Units

MDL

DATE ANALYZED

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):

Purgeable Fuels, as Gasoline (EPA 8015M) ug/L

1000

-
39000

05/02/94

PURGEABLE AROMATICS (BTXE BY EPA 8020M):

Benzene

ug/L

10

-
6500

05/02/94

Toluene

ug/L

10

500

05/02/94

Ethylbenzene

ug/L

10

1800

05/02/94

Xylenes, Total

ug/L

10

1200

05/02/94

REPORT OF LABORATORY ANALYSIS

Mr. Bill Howell
 Page 2

May 06, 1994
 PACE Project Number: 440428507

Client Reference: BP Site #11104/CP#10-155-01-004

PACE Sample Number:
 Date Collected:
 Date Received:
 Client Sample ID:

70 0312370
 04/26/94
 04/28/94
 MW-2

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	05/02/94
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	05/02/94
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	05/02/94
Benzene	ug/L	0.5	ND	05/02/94
Toluene	ug/L	0.5	ND	05/02/94
Ethylbenzene	ug/L	0.5	ND	05/02/94
Xylenes, Total	ug/L	0.5	ND	05/02/94

REPORT OF LABORATORY ANALYSIS

Mr. Bill Howell
 Page 3

May 06, 1994
 PACE Project Number: 440428507

Client Reference: BP Site #11104/CP#10-155-01-004

PACE Sample Number:
 Date Collected:
 Date Received:
 Client Sample ID:

70 0312388
 04/26/94
 04/28/94
 MW-3

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	05/02/94
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	05/02/94
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	05/02/94
Benzene	ug/L	0.5	ND	05/02/94
Toluene	ug/L	0.5	ND	05/02/94
Ethylbenzene	ug/L	0.5	ND	05/02/94
Xylenes, Total	ug/L	0.5	ND	05/02/94

REPORT OF LABORATORY ANALYSIS

Mr. Bill Howell
 Page 4

May 06, 1994
 PACE Project Number: 440428507

Client Reference: BP Site #11104/CP#10-155-01-004

PACE Sample Number:
 Date Collected:
 Date Received:
 Client Sample ID:
 Parameter

70 0312396
 04/26/94
 04/28/94
 MW-4

Units MDL DATE ANALYZED

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):				
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	-	05/02/94
PURGEABLE AROMATICS (BTXE BY EPA 8020M):				
Benzene	ug/L	0.5	ND	05/02/94
Toluene	ug/L	0.5	ND	05/02/94
Ethylbenzene	ug/L	0.5	ND	05/02/94
Xylenes, Total	ug/L	0.5	ND	05/02/94

REPORT OF LABORATORY ANALYSIS

Mr. Bill Howell
 Page 5

May 06, 1994
 PACE Project Number: 440428507

Client Reference: BP Site #11104/CP#10-155-01-004

PACE Sample Number:
 Date Collected:
 Date Received:
 Client Sample ID:

70 0312400
 04/26/94
 04/28/94
 MW-5

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS			
TOTAL FUEL HYDROCARBONS, (LIGHT):			
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

REPORT OF LABORATORY ANALYSIS

Mr. Bill Howell
 Page 6

May 06, 1994
 PACE Project Number: 440428507

Client Reference: BP Site #11104/CP#10-155-01-004

PACE Sample Number: 70 0312418
 Date Collected: 04/26/94
 Date Received: 04/28/94
 Client Sample ID: RW-1

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	05/03/94
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	1000	24000	05/03/94
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	05/03/94
Benzene	ug/L	10	3500	05/03/94
Toluene	ug/L	10	120	05/03/94
Ethylbenzene	ug/L	10	800	05/03/94
Xylenes, Total	ug/L	10	1700	05/03/94

REPORT OF LABORATORY ANALYSIS

Mr. Bill Howell
 Page 7

May 06, 1994
 PACE Project Number: 440428507

Client Reference: BP Site #11104/CP#10-155-01-004

70 0312426
 04/26/94
 04/28/94
 QC-1

PACE Sample Number:
 Date Collected:
 Date Received:
 Client Sample ID:
 Parameter

Units MDL DATE ANALYZED

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	05/03/94
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	500	22000	05/03/94
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	05/03/94
Benzene	ug/L	5.0	3300	05/03/94
Toluene	ug/L	5.0	110	05/03/94
Ethylbenzene	ug/L	5.0	700	05/03/94
Xylenes, Total	ug/L	5.0	1700	05/03/94

REPORT OF LABORATORY ANALYSIS

Mr. Bill Howell
 Page 8

May 06, 1994
 PACE Project Number: 440428507

Client Reference: BP Site #11104/CP#10-155-01-004

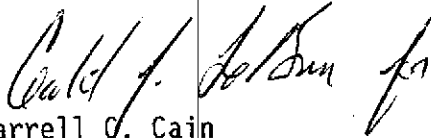
PACE Sample Number: 70 0312434
 Date Collected: 04/26/94
 Date Received: 04/28/94
 Client Sample ID: QC-2

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
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ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS			
TOTAL FUEL HYDROCARBONS, (LIGHT):			
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	05/03/94
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			
Benzene	ug/L	0.5	05/03/94
Toluene	ug/L	0.5	05/03/94
Ethylbenzene	ug/L	0.5	05/03/94
Xylenes, Total	ug/L	0.5	05/03/94

These data have been reviewed and are approved for release.



Darrell G. Cain
 Regional Director

Mr. Bill Howell
Page 9

FOOTNOTES
for pages 1 through 8

May 06, 1994
PACE Project Number: 440428507

Client Reference: BP Site #11104/CP#10-155-01-004

MDL Method Detection Limit
ND Not detected at or above the MDL.

REPORT OF LABORATORY ANALYSIS

Mr. Bill Howell
 Page 10

QUALITY CONTROL DATA

May 06, 1994
 PACE Project Number: 440428507

Client Reference: BP Site #11104/CP#10-155-01-004

PURGEABLE FUELS AND AROMATICS

Batch: 70 30043
 Samples: 70 0312361, 70 0312388, 70 0312396, 70 0312400, 70 0312418
 70 0312426

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

SPIKE AND SPIKE DUPLICATE:

Parameter	Units	MDL	700310563	Spike	Spike Recv	Spike Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	280	1000	96%	106%	10%

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	1000	106%	104%	2%

REPORT OF LABORATORY ANALYSIS

Mr. Bill Howell
 Page 11

QUALITY CONTROL DATA

May 06, 1994
 PACE Project Number: 440428507

Client Reference: BP Site #11104/CP#10-155-01-004

PURGEABLE FUELS AND AROMATICS
 Batch: 70 30092
 Samples: 70 0312370, 70 0312434

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

SPIKE AND SPIKE DUPLICATE:

Parameter	Units	MDL	700312566	Spike	Spike Recv	Spike Dupl Recv	RPD
Benzene	ug/L	0.5	190	100	73%	75%	3%
Toluene	ug/L	0.5	4.5	100	60%	62%	3%
Ethylbenzene	ug/L	0.5	21	100	58%	60%	3%
Xylenes, Total	ug/L	0.5	4.4	300	57%	59%	3%

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Benzene	ug/L	0.5	100	107%	98%	9%
Toluene	ug/L	0.5	100	103%	94%	9%
Ethylbenzene	ug/L	0.5	100	103%	94%	9%
Xylenes, Total	ug/L	0.5	300	103%	95%	8%

REPORT OF LABORATORY ANALYSIS

Mr. Bill Howell
Page 12

FOOTNOTES
for pages 10 through 11

May 06, 1994
PACE Project Number: 440428507

Client Reference: BP Site #11104/CP#10-155-01-004

MDL Method Detection Limit
ND Not detected at or above the MDL.
RPD Relative Percent Difference



440428.507

CHAIN OF CUSTODY

No.063075

CONSULTANT'S NAME <i>Alisto Engineering</i>		ADDRESS <i>1777 OAKland Blvd, Ste 200 Walnut Creek CA 94596</i>		CITY	STATE	ZIP CODE
BP SITE NUMBER <i>1104</i>	BP CORNER ADDRESS/CITY <i>1716 Webster St, Alameda</i>			CONSULTANT PROJECT NUMBER <i>10-155-01-004</i>		
CONSULTANT PROJECT MANAGER <i>Bill Howell</i>		PHONE NUMBER <i>510 295 1650</i>	FAX NUMBER <i>510 295 1823</i>		CONSULTANT CONTRACT NUMBER	
BP CONTACT <i>Scott Hooton</i>	BP ADDRESS <i>Renton WA 415</i>		PHONE NUMBER <i>415-883-6100</i>		FAX NO. <i>415-883-2673</i>	
LAB CONTACT <i>PACE</i>	LABORATORY ADDRESS <i>Novato CA</i>		PHONE NUMBER <i>415-883-6100</i>		FAX NO. <i>415-883-2673</i>	
SAMPLED BY (Please Print Name) <i>David Cosack</i>		SAMPLED BY (Signature) <i>Jan Cluser</i>		SHIPMENT DATE		SHIPMENT METHOD <i>Courier</i>

TAT: 24 Hours 48 Hours 1 Week Standard 2 Weeks

ANALYSIS REQUIRED

AIRBILL NUMBER

SAMPLE DESCRIPTION	COLLECTION DATE	MATRIX SOIL/WATER	CONTAINERS		PRESERVATIVE	HCL	COMMENTS
	COLLECTION TIME		NO.	TYPE (VOL.)	LAB SAMPLE #	TPH GAS BTEX	
MW1	4/26/04	Water	3	WA	31236.1	X	
MW2	↓	↓	↓	↓	31237.0	↓	
MW3	↓	↓	↓	↓	31236.8	↓	
MW4	↓	↓	↓	↓	31239.6	↓	
MW5	↓	↓	↓	↓	31240.0	↓	
AW 1	↓	↓	↓	↓	31241.8	↓	
QC1	↓	↓	↓	↓	31242.6	↓	
QC2	↓	↓	2	↓	31243.4	↓	

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	ADDITIONAL COMMENTS
<i>Jan Cluser Alisto</i>	<i>4/26/04</i>	<i>1600</i>	<i>Ed Kelly Pau</i>	<i>4/28/04</i>	<i>1602</i>	<i>10/3</i>
<i>Ed Kelly Pau</i>	<i>4/28/04</i>	<i>1720</i>	<i>Jan Cluser</i>	<i>4/28/04</i>	<i>1720</i>	