

BP OIL

BP Oil Company
16400 Southcenter Parkway, Suite 301
Tukwila, Washington 98188
(206) 575-4077

ALCO
HAZMAT
93 DEC 22 PM 2:07

75 days to get QMR

December 15, 1993

Mr. Brian Oliva
Alameda County Health Care Services Agency
80 Swan Way, Room 200
Oakland, CA 94621

RE: BP OIL FACILITY #11266
1541 Park Street
Alameda, CA

Attached please find our GROUNDWATER MONITORING AND SAMPLING REPORT DATED DECEMBER 6, 1993 for the above referenced facility.

I can be reached at (206) 394-5243 with questions regarding this submission.

Respectfully,



Scott T. Hooton
Environmental Resources Management

STH:sc ERM11266

cc: Mr. Eddy So, California Regional Water Quality Control Board, San Francisco Bay Region, 2101 Webster Street, Suite 500, Oakland, Ca 94612

Mr. Robert Merriken, Mobil Oil Corp, 3225 Gallows Road, Fairfax, VA 22037

Mr. Brady Nagle, ALISTO, 1777 Oakland Blvd., Suite 200, Walnut Creek, CA 94596

Site file

GROUNDWATER MONITORING AND SAMPLING REPORT

BP Oil Company Service Station No. 11266
1541 Park Street
Alameda, California

Project No. 10-050-03-002

Prepared for:

BP Oil Company
Environmental Resources Management
16400 Southcenter Parkway, Suite 301
Tukwila, Washington

Prepared by:

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

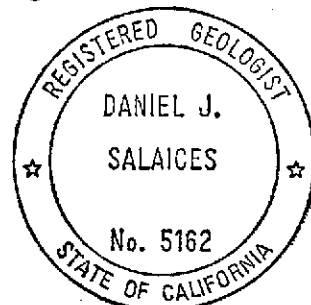
December 6, 1993

William Howell

William Howell
Project Manager

Daniel Salices

Daniel Salices
Registered Geologist



GROUNDWATER MONITORING AND SAMPLING REPORT

BP Oil Company Service Station No. 11266
1541 Park Street
Alameda, California

Project No. 10-050-03-002

December 6, 1993

INTRODUCTION

This report presents the results and findings of the September 29, 1993 groundwater monitoring and sampling conducted by Alisto Engineering Group at BP Oil Company Service Station No. 11266, 1541 Park 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 the 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 in reference to mean sea level. 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. 11266
 1541 PARK STREET, ALAMEDA, CALIFORNIA

ALISTO PROJECT NO. 10-050

| 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) | LAB |
|----------|---------------------------------|--------------------------------|--------------------------|-------------------------------------|----------------|------------|------------|------------|------------|------|
| MW-1 | 03/04/88 | 19.19 | --- | --- | 95000 | 2000 | 5900 | 1100 | 10000 | --- |
| MW-1 | 03/29/89 | 19.19 | --- | --- | 25000 | 930 | 2600 | 24 | 3100 | --- |
| MW-1 | 11/28/89 | 19.19 | --- | --- | 15000 | 280 | 880 | 340 | 1200 | --- |
| MW-1 | 02/13/91 | 19.19 | --- | --- | 25000 | 680 | 2700 | 1100 | 3200 | --- |
| MW-1 | 01/08/92 | 19.19 | --- | --- | 10000 | 260 | 1100 | 570 | 2000 | --- |
| MW-1 | 03/30/92 | 19.19 | 8.15 | 11.04 | 5800 | 290 | 570 | 500 | 1100 | PACE |
| MW-1 | 07/02/92 | 19.19 | 9.38 | 9.81 | 2500 | 170 | 60 | 310 | 300 | ANA |
| MW-1 | 07/22/92 | 19.19 | 9.62 | 9.57 | --- | --- | --- | --- | --- | --- |
| MW-1 | 10/02/92 | 19.19 | 9.98 | 9.21 | 4000 | 86 | 190 | 270 | 350 | ANA |
| QC-1 (c) | 10/02/92 | --- | --- | --- | 3600 | 89 | 180 | 270 | 340 | ANA |
| MW-1 | 12/14/92 | 19.19 | 9.90 | 9.29 | 6800 | 75 | 540 | 200 | 670 | ANA |
| QC-1 (c) | 12/14/92 | --- | --- | --- | 5900 | 68 | 480 | 190 | 600 | ANA |
| MW-1 | 03/24/93 | 19.19 | 8.52 | 10.67 | 6400 | 150 | 310 | 370 | 710 | PACE |
| MW-1 | 06/17/93 | 19.19 | 9.37 | 9.82 | 3800 | 110 | 160 | 310 | 480 | PACE |
| MW-1 | 09/29/93 | 19.19 | 10.80 | 8.39 | 1100 | 22 | 16 | 54 | 110 | PACE |
| MW-2 | 03/04/88 | 19.32 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-2 | 03/29/89 | 19.32 | --- | --- | ND | 1.1 | 0.78 | ND | 1.7 | --- |
| MW-2 | 11/28/89 | 19.32 | --- | --- | 170 | ND | ND | ND | ND | --- |
| MW-2 | 02/13/91 | 19.32 | --- | --- | 150 | 1.4 | ND | ND | 0.9 | --- |
| MW-2 | 01/08/92 | 19.32 | --- | --- | ND | 1.4 | ND | ND | 1.1 | --- |
| MW-2 | 03/30/92 | 19.32 | 9.03 | 10.29 | 91 | 0.7 | ND | ND | ND | PACE |
| MW-2 | 07/02/92 | 19.32 | 9.96 | 9.36 | 150 | 3.1 | 0.6 | 0.6 | 1.1 | ANA |
| MW-2 | 07/22/92 | 19.32 | 10.12 | 9.20 | --- | --- | --- | --- | --- | --- |
| MW-2 | 10/02/92 | 19.32 | 10.42 | 8.90 | 56 | ND<0.5 | 0.8 | 0.8 | 1.2 | ANA |
| MW-2 | 12/14/92 | 19.32 | 10.77 | 8.55 | 210 | 1.5 | ND<0.5 | 0.9 | 2.7 | ANA |
| MW-2 | 03/24/93 | 19.32 | 9.33 | 9.99 | 94 | 0.8 | ND<0.5 | ND<0.5 | 0.9 | PACE |
| QC-1 (c) | 03/24/93 | --- | --- | --- | 150 | 1.8 | 0.6 | 1.3 | 1.3 | PACE |
| MW-2 | 06/17/93 | 19.32 | 9.91 | 9.41 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | 0.7 | PACE |
| MW-2 | 09/29/93 | 19.32 | 11.39 | 7.93 | 68 | ND<0.5 | 0.9 | 0.7 | 1.9 | PACE |

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ALISTO PROJECT NO. 10-050

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|---------|------------------------------|-----------------------------|-----------------------|----------------------------------|-------------|---------|---------|---------|---------|------|
| MW-3 | 03/04/88 | 19.99 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-3 | 03/29/89 | 19.99 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-3 | 11/28/89 | 19.99 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-3 | 02/13/91 | 19.99 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-3 | 01/08/92 | 19.99 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-3 | 03/30/92 | 19.99 | 9.71 | 10.28 | ND | ND | ND | ND | ND | PACE |
| MW-3 | 07/02/92 | 19.99 | 10.52 | 9.47 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ANA |
| MW-3 | 07/22/92 | 19.99 | 10.62 | 9.37 | --- | --- | --- | --- | --- | --- |
| MW-3 | 10/02/92 | 19.99 | 10.86 | 9.13 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ANA |
| MW-3 | 12/14/92 | 19.99 | 10.53 | 9.46 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ANA |
| MW-3 | 03/24/93 | 19.99 | 9.06 | 10.93 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND>0.5 | PACE |
| MW-3 | 06/17/93 | 19.99 | 10.44 | 9.55 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND>0.5 | PACE |
| MW-3 | 09/29/93 | 19.99 | 11.06 | 8.93 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND>0.5 | PACE |
| MW-4 | 03/04/88 | 20.17 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-4 | 03/29/89 | 20.17 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-4 | 11/28/89 | 20.17 | --- | --- | 430 | 6.2 | 0.6 | 12 | 3.3 | --- |
| MW-4 | 02/13/91 | 20.17 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-4 | 01/08/92 | 20.17 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-4 | 03/30/92 | 20.17 | 8.73 | 11.44 | ND | ND | ND | ND | ND | PACE |
| MW-4 | 07/02/92 | 20.17 | 10.04 | 10.13 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ANA |
| MW-4 | 07/22/92 | 20.17 | 10.26 | 9.91 | --- | --- | --- | --- | --- | --- |
| MW-4 | 10/02/92 | 20.17 | 10.63 | 9.54 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ANA |
| MW-4 | 12/14/92 | 20.17 | 10.02 | 10.15 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ANA |
| MW-4 | 03/24/93 | 20.17 | 9.08 | 11.09 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | PACE |
| MW-4 | 06/17/93 | 20.17 | 10.03 | 10.14 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | PACE |
| MW-4 | 09/29/93 | 20.17 | 10.96 | 9.21 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | PACE |

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ALISTO PROJECT NO. 10-050

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|----------|---------------------------------|--------------------------------|--------------------------|-------------------------------------|----------------|------------|------------|------------|------------|------|
| MW-5 | 03/04/88 | 19.41 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-5 | 03/29/89 | 19.41 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-5 | 11/28/89 | 19.41 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-5 | 02/13/91 | 19.41 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-5 | 01/08/92 | 19.41 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-5 | 03/30/92 | 19.41 | 7.85 | 11.56 | ND | ND | ND | ND | ND | PACE |
| MW-5 | 07/02/92 | 19.41 | 9.27 | 10.14 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ANA |
| MW-5 | 07/22/92 | 19.41 | 9.55 | 9.86 | --- | --- | --- | --- | --- | --- |
| MW-5 | 10/02/92 | 19.41 | 9.97 | 9.44 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ANA |
| MW-5 | 12/14/92 | 19.41 | 9.14 | 10.27 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ANA |
| MW-5 | 03/24/93 | 19.41 | 8.17 | 11.24 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | PACE |
| MW-5 | 06/17/93 | 19.41 | 8.29 | 11.12 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | PACE |
| QC-1 (c) | 06/17/93 | --- | --- | --- | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | PACE |
| MW-5 | 09/29/93 | 19.41 | 10.31 | 9.10 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | 0.6 | PACE |
| MW-6 | 03/04/88 | 19.40 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-6 | 03/29/89 | 19.40 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-6 | 11/28/89 | 19.40 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-6 | 02/13/91 | 19.40 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-6 | 01/08/92 | 19.40 | --- | --- | ND | ND | ND | ND | ND | --- |
| MW-6 | 03/30/92 | 19.40 | 8.86 | 10.54 | ND | ND | ND | ND | ND | PACE |
| MW-6 | 07/02/92 | 19.40 | 9.94 | 9.46 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ANA |
| MW-6 | 07/22/92 | 19.40 | 10.10 | 9.30 | --- | --- | --- | --- | --- | --- |
| MW-6 | 10/02/92 | 19.40 | 10.48 | 8.92 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ANA |
| MW-6 | 12/14/92 | 19.40 | 10.76 | 8.64 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ANA |
| MW-6 | 03/24/93 | 19.40 | 9.19 | 10.21 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | PACE |
| MW-6 | 06/17/93 | 19.40 | 9.91 | 9.49 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | PACE |
| MW-6 | 09/29/93 | 19.40 | 11.49 | 7.91 | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | PACE |

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
 BP OIL COMPANY SERVICE STATION NO. 11266
 1541 PARK STREET, ALAMEDA, CALIFORNIA

ALISTO PROJECT NO. 10-050

| 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) | LAB |
|----------|---------------------------------|--------------------------------|--------------------------|-------------------------------------|----------------|------------|------------|------------|------------|------|
| RW-1 | 07/22/92 | --- | 9.66 | --- | 13000 | 1000 | 3400 | 380 | 2800 | ANA |
| RW-1 | 10/02/92 | --- | 10.28 | --- | --- | --- | --- | --- | --- | --- |
| RW-1 | 12/14/92 | --- | 23.28 | --- | --- | --- | --- | --- | --- | --- |
| RW-1 | 03/24/93 | --- | 8.93 | --- | 660 | 21 | 25 | 8.3 | 100 | PACE |
| RW-1 | 06/17/93 | --- | 9.66 | --- | 850 | 13 | 1.0 | 15 | 100 | PACE |
| RW-1 | 09/29/93 | 19.27 | 23.40 | -4.13 | 1200 | 26 | 27 | 11 | 150 | PACE |
| QC-1 (c) | 09/29/93 | --- | --- | --- | 1200 | 26 | 28 | 11 | 160 | PACE |
| QC-2 (d) | 10/02/92 | --- | --- | --- | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ANA |
| QC-2 (d) | 12/14/92 | --- | --- | --- | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | ANA |
| QC-2 (d) | 03/24/93 | --- | --- | --- | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | PACE |
| QC-2 (d) | 06/17/93 | --- | --- | --- | ND<50 | ND<0.5 | ND<0.5 | ND<0.5 | ND<0.5 | PACE |
| QC-2 (d) | 09/29/93 | --- | --- | --- | 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
 ppb Parts per billion
 --- Not analyzed/measured/available
 ND Not detected above reported detection limit
 PACE Pace, Inc.
 ANA Anametrix, Inc.

NOTES:

(a) Casing elevations surveyed to nearest 0.01 foot above mean sea level with an assigned elevation of 22.82 feet (City datum).
 (b) Groundwater elevations in feet above mean sea level.
 (c) Blind duplicate.
 (d) Travel blank.



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

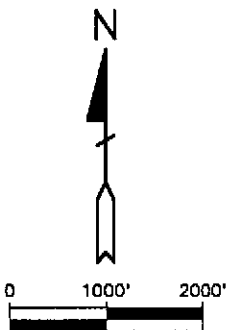


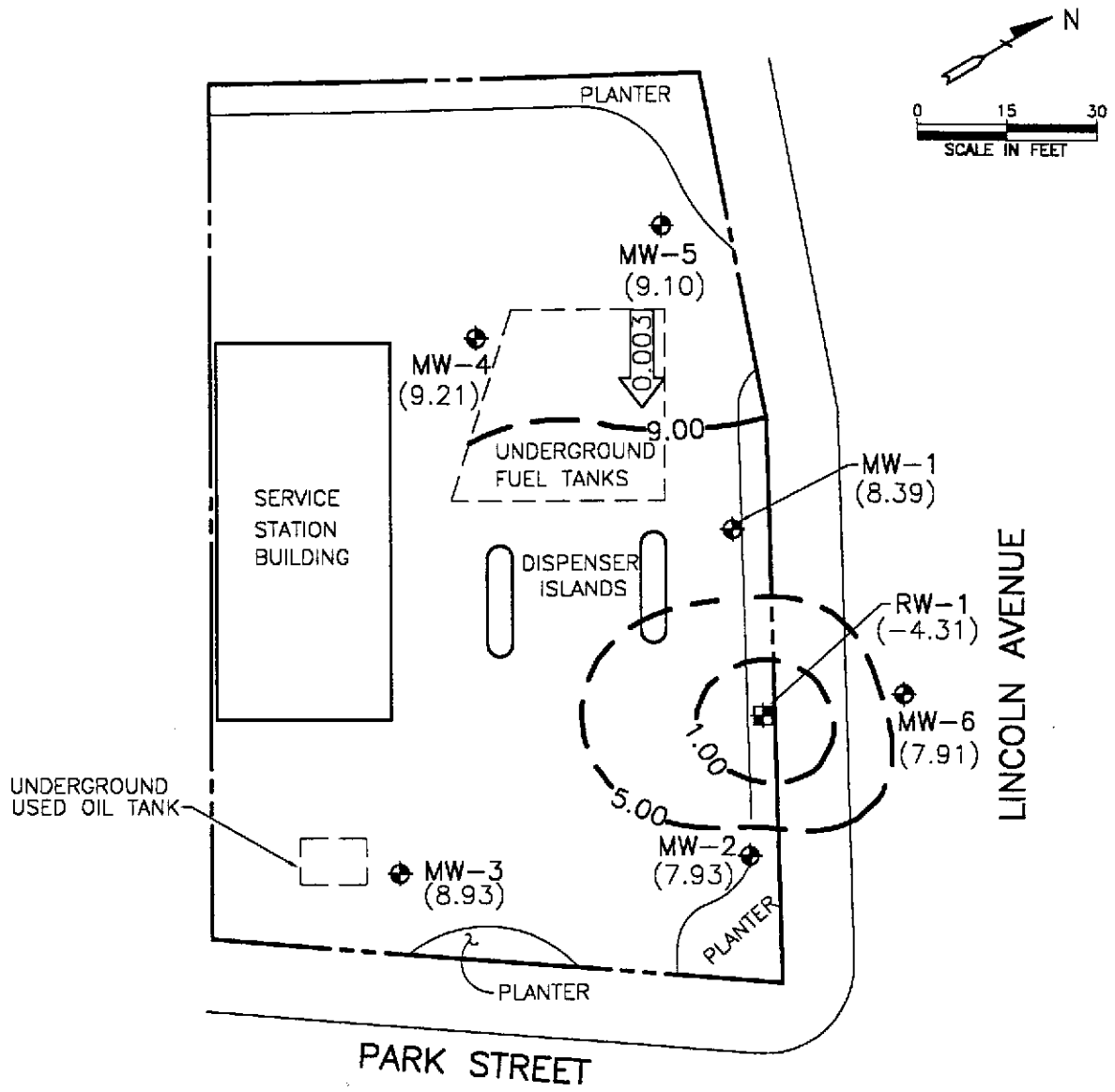
FIGURE 1

SITE VICINITY MAP

BP OIL SERVICE STATION NO. 11266
 1541 PARK STREET
 ALAMEDA, CALIFORNIA
 PROJECT NO. 10-050



ALISTO ENGINEERING GROUP
 WALNUT CREEK, CALIFORNIA



LEGEND

- ◆ GROUNDWATER MONITORING WELL
- ⊞ GROUNDWATER RECOVERY WELL
- (9.10) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- 9.00 — GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL—4.00 FEET)
- ← 0.003 ← CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 2

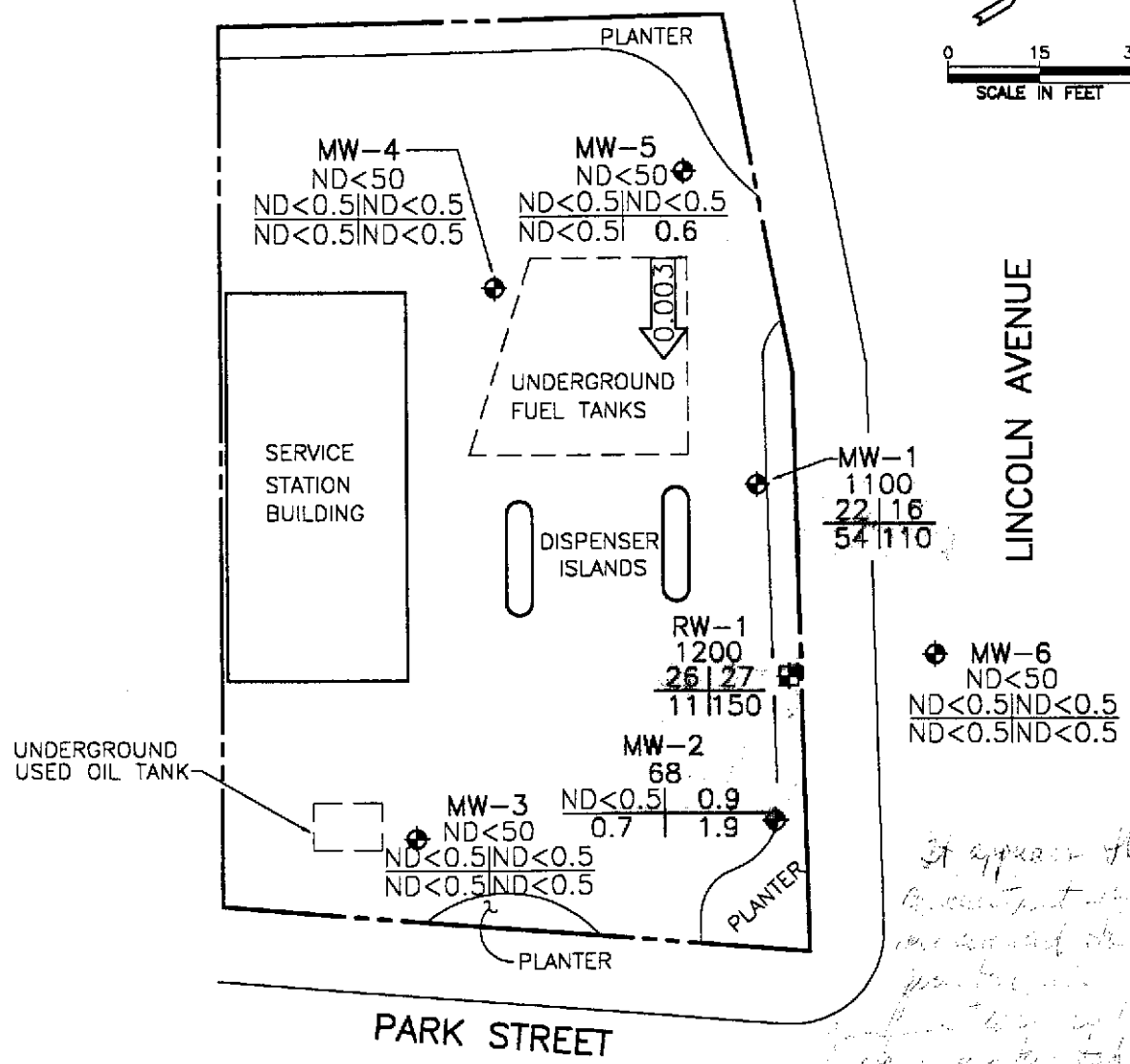
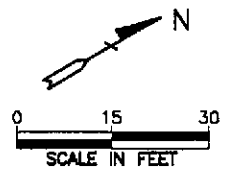
POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP

SEPTEMBER 29, 1993

BP OIL SERVICE STATION NO. 11266
 1541 PARK STREET
 ALAMEDA, CALIFORNIA

PROJECT NO. 10-050





*It appears that
 concentrations are
 measured at the
 monitoring wells
 from the top of
 the water table.
 There seems to be
 a systematic error of
 approximately 10%.*

LEGEND

- ◆ GROUNDWATER MONITORING WELL
- GROUNDWATER RECOVERY WELL
- TPH-G CONCENTRATION OF CONSTITUENTS IN PARTS PER BILLION
- B | T
- E | X
- TPH-G TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
- B BENZENE
- T TOLUENE
- E ETHYLBENZENE
- X TOTAL XYLENES
- ND NOT DETECTED ABOVE REPORTED DETECTION LIMIT
- ←0.003 CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 3
CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER
SEPTEMBER 29, 1993
 BP OIL SERVICE STATION NO. 11266
 1541 PARK STREET
 ALAMEDA, CALIFORNIA
 PROJECT NO. 10-050



APPENDIX A
WATER SAMPLING FIELD SURVEY FORMS

**Birch
Technical
Services**

Field Report / Data Sheet

Groundwater Sampling Groundwater Monitoring Well Development Drill Support Stockpile Sampling

| | | | | |
|--|---------------------------------------|---|--|-------------------------|
| 116 Liberty st Santa Cruz, Ca 95060 (408) 459-0718 | Firm: <u>Alisto</u> | Date: <u>9/29/93</u> | Station #: <u>BP11266</u> | Day: M Tu W Th <u>F</u> |
| | Project Number: <u>10-050-0302</u> | Field Technician: <u>Stephan Ryoer</u> | Address: <u>154 Park St Alhambra</u> | Weather: <u>WARM</u> |

| DT/Worder | Well ID | Lock | Exp Cap | Total Depth (feet) | 1st Depth to Water (feet) | 2nd Depth to Water (feet) | Depth to Product (feet) | Product Thickness | Comments | WELL NO. |
|-----------|---------|----------|------------|--------------------------|---------------------------------|---------------------------------|-------------------------------|----------------------|---------------|-------------|
| | | | | | | | | | | |
| T | RW-1 | OK | OK | 29.54 | 23.40 | 23.40 | | | QC-1 | 6 |
| 6 | MW-1 | OK | OK | 21.88 | 10.80 | 10.80 | | | | 2 |
| 5 | MW-2 | Replaced | OK | 23.01 | 11.39 | 11.39 | | | REPLACED LOCK | 2 |
| 2 | MW-3 | OK | OK | 19.59 | 11.06 | 11.06 | | | | 2 |
| 1 | MW-4 | OK | OK | 19.92 | 10.96 | 10.96 | | | | 2 |
| 4 | MW-5 | OK | OK | 24.24 | 10.31 | 10.31 | | | | 2 |
| 3 | MW-6 | OK | OK | 16.95 | 11.49 | 11.49 | | | | 2 |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Notes:

CALIBRATION pH 7.00 7 pH 4.00 4 pH 10.00 10 at 76 °F

Birch Technical Services

116 Liberty Street
 Santa Cruz, Ca 95060
 (408) 459-0718

GROUNDWATER SAMPLING FORM

Well Number: MW-2

Project Number: _____

Sample Type: Groundwater Trip Blank Duplicate of _____

Station Number: BD11266

Date: 9/29/93

Sampled by: STEPHEN RYDSE

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) 2" 03" 04" 04.5" 06" 0____
 Volume Factors: 0.1632 0.3672 0.6528 0.826 1.469 _____

Total Depth of Well 23.01

Initial Water Level: 11.39

PURGE METHOD:

- Honda Pump
 Disposable Poly Tubing(____) ft
 Speed Winch
 Disposable PVC Bailer(s)(____)
 Other _____

Total Volume Purged: 6

Time Elapsed: 10 min

Calculated Purge Volume:

$$\begin{matrix} 23.01 & - & 11.39 & = & 11.62 & \times & 0.1632 & = & 1.9 & \times & 3 & = & 6 & \text{(gallons)} \\ \text{Total Depth} & & \text{Water Level} & & & & \text{Well Vol. Fac.} & & & & \text{\#of vol. to Purge} & & \text{Calculated Purge Volume} \end{matrix}$$

COMMENTS:

Subjective Analysis Prior to Purging

SHEEN Depth to Product Product Thickness
 OYes No _____ (ft) _____ (ft)

SAMPLING METHOD

PVC Disposable Bailer Time Sampled
 Teflon Bailer (24 hour clock)
 Other: _____ 13:15

WELL SAMPLING PARAMETERS

| Gallons Removed | Time | Temp °F | pH | Cond. (umhos/cm) |
|-----------------|-------|---------|------|------------------|
| 1 | 13:05 | 76.4 | 7.05 | 0.90 |
| 2 | 13:07 | 76.6 | 6.79 | 0.84 |
| 3 | 13:09 | 76.4 | 6.82 | 0.91 |
| 4 | 13:11 | 76.7 | 6.83 | 0.90 |
| 5 | 13:13 | 76.4 | 6.84 | 0.87 |
| 6 | 13:15 | 76.4 | 6.82 | 0.89 |

| Analysis Required | No. of | Container Type | Preservatives |
|--|--------|----------------|--------------------------------|
| EPA 601 | | VOA's | |
| <input checked="" type="checkbox"/> TPH-G/BTEX | 3 | VOA's | HCl |
| TPH- Diesel | | Amber Liter | |
| TOG 5520 BF | | Amber Liter | H ₂ SO ₄ |
| | | | |
| | | | |

116 Liberty Street
 Santa Cruz, Ca 95060
 (408) 459-0718

Well Number: MW-3

Project Number: _____

Sample Type: Groundwater Trip Blank Duplicate of _____

Station Number: BPII266

Sampled by: STEPHEN RUDER

Date: 9/29/93

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) 2" 03" 04" 04.5" 06" 0
 Volume Factors: 0.1632 0.3672 0.6528 0.826 1.469 _____

Total Depth of Well 19.59 Initial Water Level: 11.06

PURGE METHOD:

Total Volume Purged: 5 Time Elapsed: 5 min

- Honda Pump
- Disposable Poly Tubing (____ ft)
- Speed Winch
- Disposable PVC Bailer(s) (____)
- Other _____

Calculated Purge Volume:

$19.59 - 11.06 = 8.53 \times 0.1632 = 1.4 \times 3 = 5$ (gallons)

Total Depth Water Level Well Vol. Fac. # of vol. to Purge Calculated Purge Volume

COMMENTS:

Subjective Analysis Prior to Purging

SHEEN Depth to Product Product Thickness
 O Yes No _____ (ft) _____ (ft)

SAMPLING METHOD

PVC Disposable Bailer Time Sampled
 Teflon Bailer (24 hour clock)
 Other: _____ 11:44

WELL SAMPLING PARAMETERS

| Gallons Removed | Time | Temp °F | pH | Cond. (umhos/cm) |
|-----------------|-------|---------|------|------------------|
| 1 | 11:39 | 76.9 | 7.12 | 0.83 |
| 2 | 11:41 | 76.7 | 6.91 | 0.99 |
| 3 | 11:42 | 76.8 | 6.94 | 1.02 |
| 4 | 11:43 | 76.9 | 6.95 | 1.03 |
| 5 | 11:44 | 76.8 | 6.94 | 1.03 |
| | | | | |
| | | | | |

| Analysis Required | No. of | Container Type | Preservatives |
|--|--------|----------------|--------------------------------|
| EPA 601 | | VOA's | |
| <input checked="" type="checkbox"/> TPH-G/BTEX | 3 | VOA's | HCl |
| TPH- Diesel | | Amber Liter | |
| TOG 5520 BF | | Amber Liter | H ₂ SO ₄ |
| | | | |
| | | | |
| | | | |

Birch Technical Services

116 Liberty Street
 Santa Cruz, Ca 95060
 (408) 459-0718

GROUNDWATER SAMPLING FORM

Well Number: MW-4

Project Number: _____

Sample Type: Groundwater Trip Blank Duplicate of _____

Station Number: BP11266

Date: 9/29/93

Sampled by: Stephen Ruder

WELL PURGING

PURGE VOLUME

Casing Diameter (inches) 2" 03" 04" 04.5" 06" 0
 Volume Factors: 0.1632 0.3672 0.6528 0.826 1.469 _____

Total Depth of Well 19.92

Initial Water Level: 10.96

PURGE METHOD:

- Honda Pump
 Disposable Poly Tubing (____) ft
 Speed Winch
 Disposable PVC Bailer(s) (____)
 Other _____

Total Volume Purged: 5

Time Elapsed: 5 min

Calculated Purge Volume:

$$\frac{19.92}{\text{Total Depth}} - \frac{10.96}{\text{Water Level}} = \frac{8.96}{\text{}} \times \frac{0.1632}{\text{Well Vol. Fac.}} = \frac{1.5}{\text{}} \times \frac{3}{\text{\# of vol. to Purge}} = \frac{4.5}{\text{Calculated Purge Volume}} \text{ (gallons)}$$

COMMENTS:

Subjective Analysis Prior to Purging

SHEEN Depth to Product Product Thickness
 Yes No _____ (ft) _____ (ft)

SAMPLING METHOD

PVC Disposable Bailer Teflon Bailer Other: _____
 Time Sampled (24 hour clock) 11:14

WELL SAMPLING PARAMETERS

| Gallons Removed | Time | Temp °F | pH | Cond. (umhos/cm) |
|-----------------|-------|---------|------|------------------|
| 1 | 11:09 | 73.9 | 6.58 | 0.53 |
| 2 | 11:11 | 73.6 | 6.45 | 0.58 |
| 3 | 11:12 | 73.5 | 6.51 | 0.58 |
| 4 | 11:13 | 73.6 | 6.53 | 0.60 |
| 5 | 11:14 | 73.4 | 6.53 | 0.57 |
| | | | | |
| | | | | |

| Analysis Required | No. of | Container Type | Preservatives |
|-------------------|--------|----------------|--------------------------------|
| EPA 601 | | VOA's | |
| X TPH-G/BTEX | 3 | VOA's | HCl |
| TPH- Diesel | | Amber Liter | |
| TOG 5520 BF | | Amber Liter | H ₂ SO ₄ |
| | | | |
| | | | |

116 Liberty Street
 Santa Cruz, Ca 95060
 (408) 459-0718

Well Number: MW-6

Project Number: _____

Sample Type: Groundwater Trip Blank Duplicate of _____

Station Number: BP11266

Date: 9/29/93

Sampled by: Stephen R. Rose

WELL PURGING

PURGE VOLUME Casing Diameter (inches) 0 2" 0 3" 0 4" 0 4.5" 0 6" 0 _____
 Volume Factors: 0.1632 0.3672 0.6528 0.826 1.469 _____

Total Depth of Well 16.95

Initial Water Level: 11.49

PURGE METHOD:

Total Volume Purged: 3

Time Elapsed: 5 min

- Honda Pump
- Disposable Poly Tubing(____ft)
- Speed Winch
- Disposable PVC Bailer(s)(____)
- Other _____

Calculated Purge Volume:

$$\frac{16.95}{\text{Total Depth}} - \frac{11.49}{\text{Water Level}} = \frac{5.46}{\text{Well Vol. Fac.}} \times 0.1632 = 0.9 \times \frac{3}{\text{\# of vol. to Purge}} = \frac{3}{\text{Calculated Purge Volume}} \text{ (gallons)}$$

COMMENTS:

Subjective Analysis Prior to Purging

SHEEN No Yes Depth to Product _____(ft) Product Thickness _____(ft)

SAMPLING METHOD

PVC Disposable Bailer Teflon Bailer Other: _____
 Time Sampled (24 hour clock) _____

WELL SAMPLING PARAMETERS

| Gallons Removed | Time | Temp °F | pH | Cond. (umhos/cm) | Analysis Required | No. of | Container Type | Preservatives |
|-----------------|-------|---------|------|------------------|-------------------|--------|----------------|--------------------------------|
| 0.5 | 12:05 | 78.4 | 7.51 | 0.81 | EPA 601 | | VOA's | |
| 1.0 | 12:06 | 76.9 | 7.22 | 0.75 | X TPH-G/BTEX | 3 | VOA's | HCl |
| 1.5 | 12:07 | 76.3 | 7.09 | 0.74 | TPH- Diesel | | Amber Liter | |
| 2.0 | 12:08 | 76.1 | 7.06 | 0.75 | TOG 5520 BF | | Amber Liter | H ₂ SO ₄ |
| 2.5 | 12:09 | 76.2 | 7.04 | 0.76 | | | | |
| 3.0 | 12:10 | 76.4 | 7.03 | 0.75 | | | | |

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

October 13, 1993
 PACE Project Number: 431005508

Attn: Mr. Bill Howell

Client Reference: BP Station # 11266

PACE Sample Number: 70 0165849
 Date Collected: 09/29/93
 Date Received: 10/05/93
 RW-1

| <u>Parameter</u> | <u>Units</u> | <u>MDL</u> | <u>DATE ANALYZED</u> |
|------------------|--------------|------------|----------------------|
|------------------|--------------|------------|----------------------|

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

| | | | | |
|--|------|-----|------|----------|
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - | 10/08/93 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | 1200 | 10/08/93 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | - | 10/08/93 |
| Benzene | ug/L | 0.5 | 26 | 10/08/93 |
| Toluene | ug/L | 0.5 | 27 | 10/08/93 |
| Ethylbenzene | ug/L | 0.5 | 11 | 10/08/93 |
| Xylenes, Total | ug/L | 0.5 | 150 | 10/08/93 |

Mr. Bill Howell
 Page 2

October 13, 1993
 PACE Project Number: 431005508

Client Reference: BP Station # 11266

PACE Sample Number: 70 0165857
 Date Collected: 09/29/93
 Date Received: 10/05/93
 Client Sample ID: MW-1

| <u>Parameter</u> | <u>Units</u> | <u>MDL</u> | <u>DATE ANALYZED</u> |
|------------------|--------------|------------|----------------------|
|------------------|--------------|------------|----------------------|

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

| | | | | |
|--|------|-----|------|----------|
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - | 10/08/93 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | 1100 | 10/08/93 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | - | 10/08/93 |
| Benzene | ug/L | 0.5 | 22 | 10/08/93 |
| Toluene | ug/L | 0.5 | 16 | 10/08/93 |
| Ethylbenzene | ug/L | 0.5 | 54 | 10/08/93 |
| Xylenes, Total | ug/L | 0.5 | 110 | 10/08/93 |

Mr. Bill Howell
 Page 3

October 13, 1993
 PACE Project Number: 431005508

Client Reference: BP Station # 11266

PACE Sample Number: 70 0165865
 Date Collected: 09/29/93
 Date Received: 10/05/93
 Client Sample ID: MW-2

| <u>Parameter</u> | <u>Units</u> | <u>MDL</u> | <u>DATE ANALYZED</u> |
|------------------|--------------|------------|----------------------|
|------------------|--------------|------------|----------------------|

ORGANIC ANALYSIS

| | | | |
|---|-----|-----|----------|
| <u>PURGEABLE FUELS AND AROMATICS</u> | | | |
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | - | 10/08/93 |
| Purgeable Fuels, as Gasoline (EPA 8015M) ug/L | 50 | 68 | 10/08/93 |
| <u>PURGEABLE AROMATICS (BTXE BY EPA 8020M):</u> | | - | 10/08/93 |
| Benzene ug/L | 0.5 | ND | 10/08/93 |
| Toluene ug/L | 0.5 | 0.9 | 10/08/93 |
| Ethylbenzene ug/L | 0.5 | 0.7 | 10/08/93 |
| Xylenes, Total ug/L | 0.5 | 1.9 | 10/08/93 |

Mr. Bill Howell
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October 12, 1993
 PACE Project Number: 431005508

Client Reference: BP Station # 11266

PACE Sample Number: 70 0165873
 Date Collected: 09/29/93
 Date Received: 10/05/93
 Client Sample ID: MW-3

| <u>Parameter</u> | <u>Units</u> | <u>MDL</u> | <u>DATE ANALYZED</u> |
|------------------|--------------|------------|----------------------|
|------------------|--------------|------------|----------------------|

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

| | | | | |
|--|------|-----|----|----------|
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - | 10/10/93 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | ND | 10/10/93 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | - | 10/10/93 |
| Benzene | ug/L | 0.5 | ND | 10/10/93 |
| Toluene | ug/L | 0.5 | ND | 10/10/93 |
| Ethylbenzene | ug/L | 0.5 | ND | 10/10/93 |
| Xylenes, Total | ug/L | 0.5 | ND | 10/10/93 |

Mr. Bill Howell
 Page 5

October 12, 1993
 PACE Project Number: 431005508

Client Reference: BP Station # 11266

PACE Sample Number: 70 0165881
 Date Collected: 09/29/93
 Date Received: 10/05/93
 Client Sample ID: MW-4

| <u>Parameter</u> | <u>Units</u> | <u>MDL</u> | <u>DATE ANALYZED</u> |
|------------------|--------------|------------|----------------------|
|------------------|--------------|------------|----------------------|

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

| | | | | |
|--|------|-----|----|----------|
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - | 10/08/93 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | ND | 10/08/93 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | - | 10/08/93 |
| Benzene | ug/L | 0.5 | ND | 10/08/93 |
| Toluene | ug/L | 0.5 | ND | 10/08/93 |
| Ethylbenzene | ug/L | 0.5 | ND | 10/08/93 |
| Xylenes, Total | ug/L | 0.5 | ND | 10/08/93 |

Mr. Bill Howell
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October 12, 1993
 PACE Project Number: 431005508

Client Reference: BP Station # 11266

PACE Sample Number: 70 0165890
 Date Collected: 09/29/93
 Date Received: 10/05/93
 Client Sample ID: MW-5

| <u>Parameter</u> | <u>Units</u> | <u>MDL</u> | <u>DATE ANALYZED</u> |
|------------------|--------------|------------|----------------------|
|------------------|--------------|------------|----------------------|

ORGANIC ANALYSIS

PURGEABLE FUELS AND AROMATICS

| | | | | |
|--|------|-----|-----|----------|
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - | 10/08/93 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | ND | 10/08/93 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | - | 10/08/93 |
| Benzene | ug/L | 0.5 | ND | 10/08/93 |
| Toluene | ug/L | 0.5 | ND | 10/08/93 |
| Ethylbenzene | ug/L | 0.5 | ND | 10/08/93 |
| Xylenes, Total | ug/L | 0.5 | 0.6 | 10/08/93 |

Mr. Bill Howell
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October 12, 1993
 PACE Project Number: 431005508

Client Reference: BP Station # 11266

PACE Sample Number: 70 0165903
 Date Collected: 09/29/93
 Date Received: 10/05/93
 Client Sample ID: MW-6

| <u>Parameter</u> | <u>Units</u> | <u>MDL</u> | <u>DATE ANALYZED</u> |
|------------------|--------------|------------|----------------------|
|------------------|--------------|------------|----------------------|

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 |

Mr. Bill Howell
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October 13, 1993
 PACE Project Number: 431005508

Client Reference: BP Station # 11266

PACE Sample Number: 70 0165911
 Date Collected: 09/29/93
 Date Received: 10/05/93
 Client Sample ID: QC-1

| <u>Parameter</u> | <u>Units</u> | <u>MDL</u> | <u>DATE ANALYZED</u> |
|------------------|--------------|------------|----------------------|
|------------------|--------------|------------|----------------------|

ORGANIC ANALYSIS

| | | | |
|--|------|-----|----------|
| PURGEABLE FUELS AND AROMATICS | | | |
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | 10/08/93 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | 1200 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | 10/08/93 |
| Benzene | ug/L | 0.5 | 26 |
| Toluene | ug/L | 0.5 | 28 |
| Ethylbenzene | ug/L | 0.5 | 11 |
| Xylenes, Total | ug/L | 0.5 | 160 |

REPORT OF LABORATORY ANALYSIS

Mr. Bill Howell
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October 12, 1993
 PACE Project Number: 431005508

Client Reference: BP Station # 11266

PACE Sample Number: 70 0165920
 Date Collected: 09/29/93
 Date Received: 10/05/93
 Client Sample ID: QC-2

| <u>Parameter</u> | <u>Units</u> | <u>MDL</u> | | <u>DATE ANALYZED</u> |
|--|--------------|------------|----|----------------------|
| <u>ORGANIC ANALYSIS</u> | | | | |
| PURGEABLE FUELS AND AROMATICS | | | | |
| TOTAL FUEL HYDROCARBONS, (LIGHT): | | | - | 10/08/93 |
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | ND | 10/08/93 |
| PURGEABLE AROMATICS (BTXE BY EPA 8020M): | | | | |
| Benzene | ug/L | 0.5 | ND | 10/08/93 |
| Toluene | ug/L | 0.5 | ND | 10/08/93 |
| Ethylbenzene | ug/L | 0.5 | ND | 10/08/93 |
| Xylenes, Total | ug/L | 0.5 | ND | 10/08/93 |

These data have been reviewed and are approved for release.

Darrell C. Cain
 Darrell C. Cain
 Regional Director

Mr. Bill Howell
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FOOTNOTES
for pages 1 through 9

October 12, 1993
PACE Project Number: 431005508

Client Reference: BP Station # 11266

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

Mr. Bill Howell
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QUALITY CONTROL DATA

October 12, 1993
 PACE Project Number: 431005508

Client Reference: BP Station # 11266

PURGEABLE FUELS AND AROMATICS

Batch: 70 25361

Samples: 70 0165849, 70 0165857, 70 0165865, 70 0165881, 70 0165890
 70 0165903, 70 0165911, 70 0165920

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 |

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

| Parameter | Units | MDL | Reference Value | Recv | Dup1 Recv | RPD |
|--|-------|-----|-----------------|------|-----------|-----|
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | 1000 | 110% | 115% | 4% |
| Benzene | ug/L | 0.5 | 40.0 | 103% | 100% | 2% |
| Toluene | ug/L | 0.5 | 40.0 | 108% | 103% | 4% |
| Ethylbenzene | ug/L | 0.5 | 40.0 | 109% | 104% | 4% |
| Xylenes, Total | ug/L | 0.5 | 120 | 110% | 104% | 5% |

Mr. Bill Howell
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QUALITY CONTROL DATA

October 12, 1993
 PACE Project Number: 431005508

Client Reference: BP Station # 11266

PURGEABLE FUELS AND AROMATICS
 Batch: 70 25411
 Samples: 70 0165873

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 |

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

| Parameter | Units | MDL | Reference Value | Recv | Dup1 Recv | RPD |
|--|-------|-----|-----------------|------|-----------|-----|
| Purgeable Fuels, as Gasoline (EPA 8015M) | ug/L | 50 | 1000 | 113% | 104% | 8% |
| Benzene | ug/L | 0.5 | 40.0 | 104% | 106% | 1% |
| Toluene | ug/L | 0.5 | 40.0 | 107% | 109% | 1% |
| Ethylbenzene | ug/L | 0.5 | 40.0 | 108% | 108% | 0% |
| Xylenes, Total | ug/L | 0.5 | 120 | 108% | 109% | 0% |

Mr. Bill Howell
Page 13

FOOTNOTES
for pages 11 through 12

October 12, 1993
PACE Project Number: 431005508

Client Reference: BP Station # 11266

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

