EXCELTECH

# SEPTEMBER QUARTERLY REPORT GROUNDWATER SAMPLING AND ANALYSIS

FOR

SHELL SERVICE STATION
230 MACARTHUR BOULEVARD
OAKLAND, CALIFORNIA

Project No. 1847-2G
October 1990

**Northern California Regional Office** 41674 Christy Street, Fremont, CA 94538-3114 (415) 659-0404 Fax: (415) 651-4677 Lic. # 596545

EXCELTECH

October 1, 1990

Shell Oil Company
1390 Willow Pass Road, Suite 900
Concord, CA 94520

Attention: Ms. Diane Lundquist

Subject: September Quarterly Report
Groundwater Sampling and Analysis
Shell Service Station, 230 MacArthur Boulevard, Oakland, California
Exceltech Project No. 1847-2G

Dear Ms. Lundquist:

At the request of Shell Oil Company, Exceltech, Inc., has prepared this letter report containing the results of the September 5, 1990 groundwater sampling at the subject site in the City of Oakland, Alameda County, California (Figure 1). This report also contains a groundwater elevation map for September 1990 (Figure 2).

## Groundwater Sampling

Groundwater samples were collected from four groundwater monitoring wells on the site in accordance with Exceltech's groundwater sampling protocol (Appendix A). The groundwater purged from the wells and equipment rinse water were placed in Department of Transportation-approved drums and left on-site pending authorization to have them pumped for disposal. A summary of groundwater sampling data is presented on Table 1.

## Laboratory Analysis

Sequoia Analytical of Redwood City, California, a state-certified laboratory, analyzed the groundwater samples for the presence of total petroleum hydrocarbons as gasoline (TPHG), and benzene, toluene, ethyl benzene, and total xylenes (BTEX). Samples were also analyzed for total dissolved solids (TDS).

## Summary of Laboratory Results

Groundwater analyses are summarized in Table 1. Copies of the analytical reports from Seqouia Analytical and chain-of-custody documents are attached in Appendix B.

## Discussion

The groundwater surface contour map developed from the September 5, 1990 water level measurements is presented as Figure 2. The apparent groundwater surface inclination decreased from 1.1 percent to 0.5 percent during this quarter. The groundwater level dropped from between 0.51 foot to 1.13 feet in all the wells. Hydrocarbon concentrations in MW-4 have changed slightly from the June 1990 sample results. No hydrocarbon concentrations were detected in the other wells.

## Reporting Requirements

Shell Oil company should forward a copy of this report to the following agencies in a timely manner:

Alameda County Flood Control
and Water Conservation District
5997 Parkside Drive
Pleasanton, California 94566
Attention: Mr. Craig Mayfield

Regional Water Quality Control Board
San Francisco Bay Region
1800 Harrison Street, Suite 700
Oakland, California 94512-3429
Attention: Ms. Lisa McCann

Alameda County Health Department
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621
Attention: Mr. Gil Wistar

## Disclaimer

This report has been prepared soley for the use of Shell and any reliance on this report by third parties shall be as such party's sole risk.

## Limitations

The discussion and recommendations presented in this report are based on the following:

1. The exploratory test borings drilled at the site.
2. The observations by field personnel.
3. The results of laboratory analyses performed by a state-certified laboratory.
4. Our understanding of the regulations of the State of California and Alameda County and/or the City of Oakland.

It is possible that variations in the soil or groundwater conditions could exist beyond the points explored in this investigation. Also, changes in the groundwater conditions could occur at some time in the future due to variations in rainfall, temperature, regional water usage, or other factors.

The service performed by Exceltech has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the Oakland area. Please note that contamination of soil and groundwater must be reported to the appropriate agencies in a timely manner. No other warranty, expressed or implied, is made.

Exceltech includes in this report chemical analytical data from a state-certified laboratory. The analytical results are performed according to procedures suggested by the U.S. EPA and State of California. Exceltech is not responsible for laboratory errors in procedure or reporting.

If you have any questions or require additional information, please call.

Sincerely,
Exceltech, Inc.

Kay Pannell
Staff Geologist

Neil H. Zickefoose, C.E.G. 398
Senior Program Geologist

KP/NHZ/sr
Enclosure

# TABLE 1
# GROUNDWATER ANALYSES DATA

| Well | Date Sampled | TPHG (ppm) | Benzene (ppm) | Toluene (ppm) | Ethyl Benzene (ppm) | Total Xylenes (ppm) | TDS (ppm) | Well Elevation (ft.) | Depth To Water (ft.) |
|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 7/14/88 | N D | N D | N D | N D | N D | N A | 73.89 | 13.30 |
| | 10/4/88 | B R L | 0.008 | 0.0043 | B R L | 0.009 | N A | | 13.65 |
| | 11/10/88 | B R L | B R L | B R L | B R L | B R L | N A | | 13.55 |
| | 12/9/88 | N D | N D | N D | N D | N D | N A | | 13.22 |
| | 1/10/89 | N D | N D | N D | N D | N D | N A | | 12.86 |
| | 1/20/89 | N A | N A | N A | N A | N A | N A | | 12.91 |
| | 2/6/89 | N D | N D | N D | N D | N D | N A | | 12.94 |
| | 3/10/89 | N D | N D | N D | N D | N D | N A | | 12.59 |
| | 6/6/89 | N D | N D | N D | N D | N D | N A | | 14.05 |
| | 9/7/89 | N D | N D | N D | N D | N D | N A | | 14.92 |
| | 12/18/89 | N D | N D | N D | N D | N D | N A | | 14.88 |
| | 3/8/90 | ND | ND | ND | ND | ND | 420 | | 14.08 |
| | 6/7/90 | ND | ND | ND | ND | ND | 430 | | 13.89 |
| | 9/5/90 | ND | ND | ND | ND | ND | 500 | | 14.83 |
| MW-2 | 7/14/88 | N D | 0.0079 | 0.0026 | 0.0011 | 0.004 | N A | 75.24 | 15.18 |
| | 10/4/88 | 0.09 | B R L | 0.0013 | 0.0025 | 0.012 | N A | | 15.30 |
| | 11/10/88 | B R L | B R L | B R L | B R L | 0.002 | N A | | 15.17 |
| | 12/9/88 | N D | N D | 0.0006 | N D | 0.003 | N A | | 14.82 |
| | 1/20/89 | N D | N D | N D | N D | N D | 456 | | 14.54 |
| | 2/6/89 | N D | N D | N D | N D | N D | 400 | | 14.59 |
| | 3/10/89 | N D | N D | N D | N D | N D | 407 | | 14.88 |
| | 6/6/89 | N D | N D | N D | N D | N D | N A | | 15.30 |
| | 9/7/89 | N D | N D | N D | N D | N D | N A | | 16.76 |
| | 12/18/89 | N D | N D | 0.0005 | N D | N D | N A | | 16.65 |
| | 3/8/90 | ND | ND | ND | ND | ND | 380 | | 15.92 |
| | 6/7/90 | ND | ND | ND | ND | ND | 380 | | 16.10 |
| | 9/5/90 | ND | ND | ND | ND | ND | 400 | | 16.61 |
| MW-3 | 7/14/88 | N D | N D | N D | N D | N D | N A | 74.68 | 14.05 |
| | 10/4/88 | B R L | B R L | B R L | B R L | 0.005 | N A | | 14.60 |
| | 11/10/88 | B R L | B R L | B R L | B R L | B R L | N A | | 14.35 |
| | 12/9/88 | N D | N D | N D | N D | N D | N A | | 14.04 |

# TABLE 1
# GROUNDWATER ANALYSES DATA

| Well | Date Sampled | TPHG (ppm) | Benzene (ppm) | Toluene (ppm) | Ethyl Benzene (ppm) | Total Xylenes (ppm) | TDS (ppm) | Well Elevation (ft.) | Depth To Water (ft.) |
|---|---|---|---|---|---|---|---|---|---|
| MW-3 con't | 1/10/89 | N D | N D | N D | N D | N D | N A | | 13.70 |
| | 1/20/89 | N A | N A | N A | N A | N A | N A | | 13.72 |
| | 2/6/89 | 0.07 | N D | N D | N D | N D | N A | | 13.75 |
| | 3/10/89 | 0.15 | N D | N D | N D | N D | N A | | 13.42 |
| | 6/6/89 | N D | N D | N D | N D | N D | N A | | 14.52 |
| | 9/7/89 | N D | 0.00065 | N D | N D | N D | N A | | 15.52 |
| | 12/6/89 | 0.04 | 0.0013 | N D | 0.00044 | 0.00066 | N A | | 19.59 |
| | 3/8/90 | ND | ND | ND | ND | ND | 440 | | 14.72 |
| | 6/7/90 | ND | ND | ND | ND | ND | 490 | | 14.65 |
| | 9/5/90 | ND | ND | ND | ND | ND | 500 | | 15.51 |
| MW-4 | 1/23/90 | 1.6 | 0.1 | 0.01 | 0.03 | 0.02 | NA | 73.83 | 14.68 |
| | 3/8/90 | 4.2 | 0.26 | 0.018 | 0.088 | 0.039 | 480 | | 14.38 |
| | 6/7/90 | 2.0 | 0.15 | 0.0069 | 0.014 | 0.017 | 460 | | 14.27 |
| | 9/5/90 | 1.7 | 0.13 | 0.01 | 0.0072 | 0.018 | 440 | | 15.4 |

LEGEND

| | |
|---|---|
| TPHG | Total petroleum hydrocarbons as gasoline |
| ppm | parts per million |
| N D | None detected at or above detection limit method |
| B R L | Below reporting limit |
| N A | Not Analyzed |
| T D S | Total dissolved solids |

Note: See laboratory reports for detection and reporting limits


BASE: USGS 7.5 MINUTE TOPOGRAPHIC SHEET

EXCELTECH

# SITE LOCATION MAP

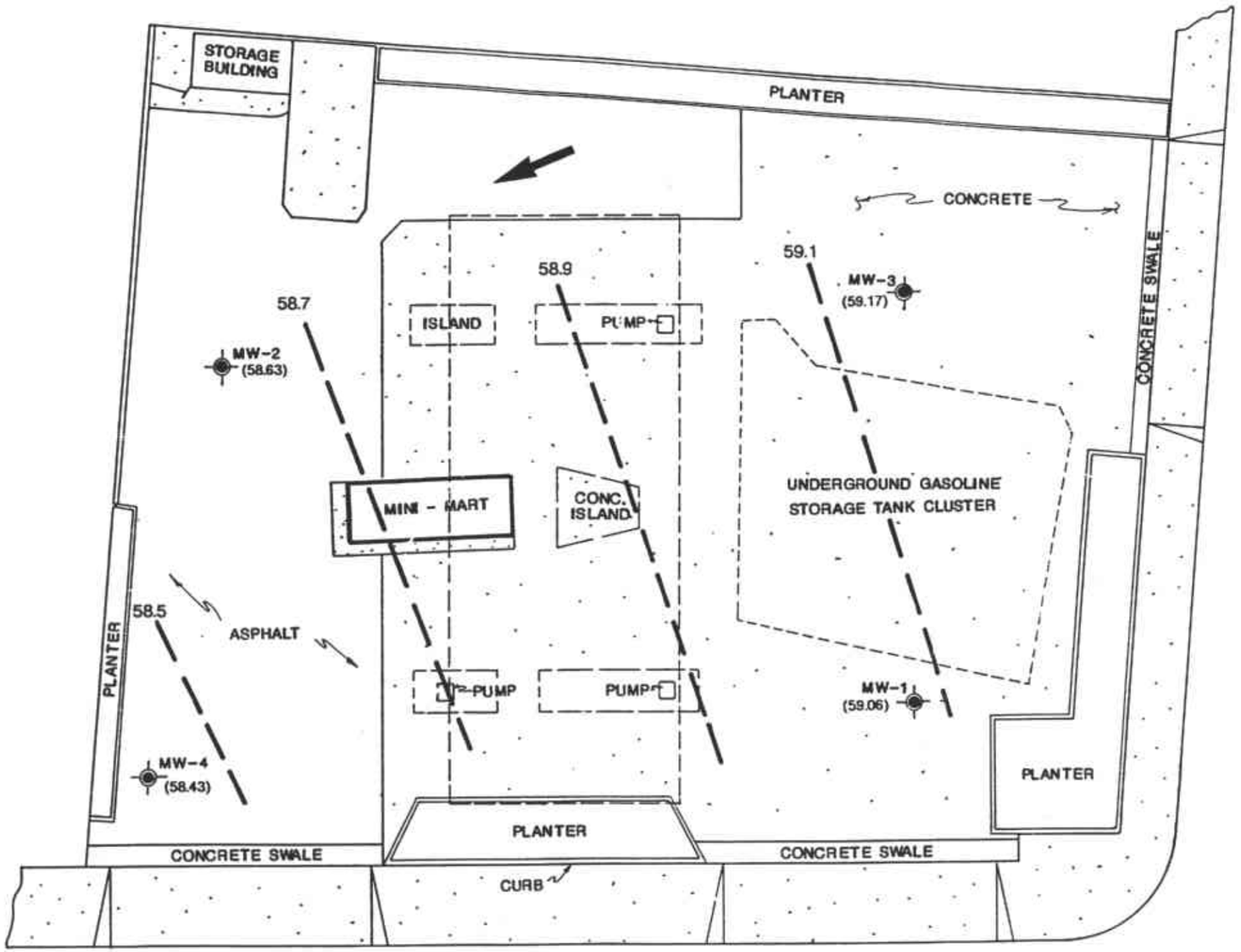
SHELL SERVICE STATION

230 MacARTHUR BOULEVARD

OAKLAND, CALIFORNIA

| REVIEWED BY: | APPROVED BY: |
|---|---|
| K. P. | TMB |
| JOB #: 1847G | DRAWN BY: SLS |
| DATE: 9-16-88 | DRAWING #: FIG: 1 |

A-1847G-1




LEGEND

MW-1 GROUNDWATER MONITORING WELL

(59.17) GROUNDWATER ELEVATION IN FEET (DATUM: M.S.L.)

59.1 GROUNDWATER ELEVATION CONTOUR LINE IN FEET (DATUM: M.S.L.)

APPARENT GROUNDWATER FLOW DIRECTION

N

0 20

APPROX. SCALE IN FEET

EXCELTECH

**GROUNDWATER ELEVATION MAP (9/5/90)**

SHELL SERVICE STATION

230 MAC ARTHUR BOULEVARD

OAKLAND, CALIFORNIA

| REVIEWED BY: | APPROVED BY: |
|---|---|
| K.P. | |
| JOB #: 1847-2G | DRAWN BY: J.D.S. |
| DATE: 9/14/90 | DRAWING #: FIG. 2 |

# APPENDIX A

# SAMPLING PROTOCOL

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# Groundwater Sampling Protocol

# GROUNDWATER SAMPLING PROTOCOL

Sampling of groundwater is performed by Exceltech, Inc. sampling technicians. Summarized field sampling procedures are as follows:

1. Measurements of liquid surface in the well and depth of monitoring well.

2. Field check for presence of floating product.

3. Purge well prior to collecting samples.

4. Monitor groundwater for temperature, pH, and specific conductance during purging.

5. Collect samples using Environmental Protection Agency (EPA) approved sample collection devices, i.e., teflon or stainless steel bailers or pumps.

6. Transfer samples into laboratory-supplied EPA-approved containers.

7. Label samples and log onto chain-of-custody form.

8. Store samples in a chilled ice chest for shipment to a state-certified analytical laboratory.

# GROUNDWATER SAMPLING PROCEDURES

Equipment Cleaning

All water samples are placed in precleaned laboratory-supplied bottles. Sample bottles and caps remain sealed until actual usage at the site. All equipment which comes in contact with the well or groundwater is thoroughly cleaned with a trisodium phosphate (TSP) solution and rinsed with deionized or distilled water before use at the site. This cleaning procedure is followed between each well sampled. Wells are sampled in approximate order of increasing contamination. If a teflon cord is used, the cord is cleaned. If a nylon or cotton cord is used, a new cord is used in each well All equipment blanks are collected prior to sampling. The blanks are analyzed periodically to ensure proper cleaning.

Water Level Measurements

Depth to groundwater is measured in each well using a sealed sampling tape or scaled electric sounder prior to purging or sampling. If the well is known or suspected of containing free-phase petroleum hydrocarbons, an optical interface probe is used to measure the hydrocarbon thickness and groundwater level. Measurements are collected and recorded to the nearest 0.01 foot.

Bailer Sheen Check

If no measurable free-phase petroleum hydrocarbons are detected, a clear acrylic bailer is used to determine the presence of a sheen. Any observed film as well as odor and color of the water is recorded.

Groundwater Sampling

Prior to groundwater sampling, each well is purged of "standing" groundwater. Either a bailer, hand pump, or submersible pump is used to purge the well. The amount of purging is dependent on the well yield. In a high yield formation, samples will be collected when normal field measurement, including temperature, pH, and specific conductance stabilize, provided a minimum of three well-casing volumes of water have been removed. Field measurements will be taken after purging each well volume. In low yield formations, the well is purged such that the "standing" water is removed and the well is allowed to recharge. (Normal field measurements will be periodically recorded during the purging process.) In

situations where recovery to 80% of static water level is estimated, or observed to exceed a two hour duration, a sample will be collected when sufficient volume is available for a sample for each parameter. At no time will the well be purged dry so that the recharge rate causes the formation water to cascade into the well.

In wells where free-phase hydrocarbons are detected, the free-phase portion will be bailed from the well and the volume removed recorded. A groundwater sample will be collected if bailing reduces the amount of free-phase hydrocarbons to the point where they are not present in the well. Well sampling will be conducted using one of the aforementioned methods depending on the formation yield. However, if free-phase hydrocarbons persist throughout bailing, then a groundwater samples will not be collected.

Groundwater sample containers are labeled with a unique sample number, location, product name and number, and date of collection. All samples are logged into a chain-of-custody form and placed in a chilled ice chest for shipment to a laboratory certified by the State of California Department of Health Services.

# APPENDIX B

# LABORATORY REPORT
# AND
# CHAIN-OF-CUSTODY FORM

# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233


Exceltech
41674 Christy Street
Fremont, CA 94538
Attention: Kay Pannell

Project: #1847-2G, Shell, Oakland

Enclosed are the results from 5 water samples received at Sequoia Analytical on September 5,1990. The requested analyses are listed below:

| SAMPLE # | SAMPLE DESCRIPTION | DATE OF COLLECTION | TEST METHOD |
|---|---|---|---|
| 90527 | Water, BB1 | 9/5/90 | EPA 5030/8015/8020 |
| 90528 | Water, MW1 | 9/5/90 | Dissolved Solids<br>EPA 5030/8015/8020 |
| 90529 | Water, MW2 | 9/5/90 | Dissolved Solids<br>EPA 5030/8015/8020 |
| 90530 | Water, MW3 | 9/5/90 | Dissolved Solids<br>EPA 5030/8015/8020 |
| 90531 | Water, MW | 9/5/90 | Dissolved Solids<br>EPA 5030/8015/8020 |

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

Vickie Tague
Project Manager

# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233


| | | | | |
|---|---|---|---|---|
| Exceltech | Client Project ID: | #1847-2G, Shell, Oakland | Sampled: | Sep 5, 1990 |
| 41674 Christy Street | Sample Descript: | Water | Received: | Sep 5, 1990 |
| Fremont, CA 94538 | Analysis for: | Dissolved Solids | | |
| Attention: Kay Pannell | First Sample #: | 009-0528 | Analyzed: | Sep 7, 1990 |
| | | | Reported: | Sep 11, 1990 |

## LABORATORY ANALYSIS FOR: Dissolved Solids

| Sample Number | Sample Description | Detection Limit mg/L | Sample Result mg/L |
|---|---|---|---|
| 009-0528 | MW1 | 1.0 | 500 |
| 009-0529 | MW2 | 1.0 | 400 |
| 009-0530 | MW3 | 1.0 | 500 |
| 009-0531 | MW | 1.0 | 440 |

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

**SEQUOIA ANALYTICAL**

Vickie Tague
Project Manager

# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233


Exceltech
41674 Christy Street
Fremont, CA 94538
Attention: Kay Pannell

Client Project ID: #1847-2G, Shell, Oakland

QC Sample Group: 0090528-531

Reported: Sep 11, 1990

## QUALITY CONTROL DATA REPORT

| ANALYTE | Dissolved Solids |
|---|---|

| | |
|---|---|
| Method: | EPA 160.1 |
| Analyst: | A. Pannu |
| Reporting Units: | mg/L |
| Date Analyzed: | Sep 7, 1990 |
| QC Sample #: | 009-0531 |

| | |
|---|---|
| **Sample Conc.:** | 450 |
| **Spike Conc. Added:** | N.A. |
| **Conc. Matrix Spike:** | N.A. |
| **Matrix Spike % Recovery:** | N.A. |
| **Conc. Matrix Spike Dup.:** | 430 |
| **Matrix Spike Duplicate % Recovery:** | N.A. |
| **Relative % Difference:** | 4.5 |

**SEQUOIA ANALYTICAL**

Vickie Tague
Project Manager

| | | |
|---|---|---|
| % Recovery: | Conc. of M.S. - Conc. of Sample / Spike Conc. Added | x 100 |
| Relative % Difference: | Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2 | x 100 |

# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233


| | | | | |
|---|---|---|---|---|
| Exceltech | Client Project ID: | #1847-2G, Shell, Oakland | Sampled: | Sep 5, 1990 |
| 41674 Christy Street | Matrix Descript: | Water | Received: | Sep 6, 1990 |
| Fremont, CA 94538 | Analysis Method: | EPA 5030/8015/8020 | Analyzed: | Sep 6, 1990 |
| Attention: Kay Pannell | First Sample #: | 009-0527 A-B | Reported: | Sep 11, 1990 |

## TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

| Sample Number | Sample Description | Low/Medium B.P. Hydrocarbons mg/L (ppm) | Benzene mg/L (ppm) | Toluene mg/L (ppm) | Ethyl Benzene mg/L (ppm) | Xylenes mg/L (ppm) |
|---|---|---|---|---|---|---|
| 009-0527 | BB1 | 0.18 | 0.00036 | 0.00055 | 0.00040 | 0.0017 |
| 009-0528 | MW1 | N.D. | N.D. | N.D. | N.D. | N.D. |
| 009-0529 | MW2 | N.D. | N.D. | N.D. | N.D. | N.D. |
| 009-0530 | MW3 | N.D. | N.D. | N.D. | N.D. | N.D. |
| 009-0531 | MW | 1.7 | 0.13 | 0.010 | 0.0072 | 0.018 |
| **Detection Limits:** | | **0.030** | **0.00030** | **0.00030** | **0.00030** | **0.00030** |

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

**SEQUOIA ANALYTICAL**

VM Tague

Vickie Tague
Project Manager

# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233


Exceltech
41674 Christy Street
Fremont, CA 94538
Attention: Kay Pannell

Client Project ID: #1847-2G, Shell, Oakland

QC Sample Group: 0090527-53

Reported: Sep 11, 1990

## QUALITY CONTROL DATA REPORT

| ANALYTE | Benzene | Toluene | Ethyl Benzene | Xylenes |
|---|---|---|---|---|
| Method: | EPA 8020 | EPA 8020 | EPA 8020 | EPA 8020 |
| Analyst: | W. Parks | W. Parks | W. Parks | W. Parks |
| Reporting Units: | µg/L | µg/L | µg/L | µg/L |
| Date Analyzed: | Sep 6, 1990 | Sep 6, 1990 | Sep 6, 1990 | Sep 6, 1990 |
| QC Sample #: | 009-0531 | 009-0531 | 009-0531 | 009-0531 |
| **Sample Conc.:** | N.D. | N.D. | N.D. | N.D. |
| **Spike Conc. Added:** | 10 | 10 | 10 | 30 |
| **Conc. Matrix Spike:** | 10 | 8.8 | 9.7 | 28 |
| **Matrix Spike % Recovery:** | 100 | 88 | 97 | 93 |
| **Conc. Matrix Spike Dup.:** | 9.3 | 7.9 | 8.6 | 26 |
| **Matrix Spike Duplicate % Recovery:** | 93 | 79 | 86 | 87 |
| **Relative % Difference:** | 7.3 | 11 | 12 | 7.4 |

**SEQUOIA ANALYTICAL**

VM Tague

Vickie Tague
Project Manager

| | | |
|---|---|---|
| % Recovery: | Conc. of M.S. - Conc. of Sample / Spike Conc. Added | x 100 |
| Relative % Difference: | Conc. of M.S. - Conc. of M.S.D. / (Conc. of M.S. + Conc. of M.S.D.) / 2 | x 100 |

# CHAIN OF CUSTODY RECORD

AFE # 086663 CTDL 5440 Diane Lundquist

| PROJECT NO. | PROJECT NAME |
|---|---|
| 1847-26 | Shell 230 W MacArthur Oakland |

SAMPLERS (Signature) James gonzales

| NO. | DATE | TIME | SAMPLE DESCRIPTION | TPHG-BTEX | Total dissolved solids | | | | | | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BB1 | 9-5-90 | 1:51 | 2 preserved VOA (HCL) | X | | | | | | | 009 AB |
| mw 1 | " | 1:59 | 3 pres. VOA, 1 amber liter | X | X | | | | | | 028 A/B/A-C |
| mw 2 | " | 2:36 | " " | X | X | | | | | | 029 |
| mw 3 | " | 3:23 | " " | X | X | | | | | | 030 |
| mw | " | 4:00 | " " | X | X | | | | | | 031 |

TEST REQUESTED

P.O.# 986645

LAB Sequoia

TURN AROUND TIME 5day

REMARKS

| RELINQUISHED BY: | DATE: | TIME: | RECEIVED BY: | RELINQUISHED BY: | DATE: | TIME: | RECEIVED BY: |
|---|---|---|---|---|---|---|---|
| James gonzales | 9-5-90 | 4:57 | | | 9-5-90 | 10:05 | James gonzales |
| James gonzales | 9-6-90 | 10:35 | | | 9/6 | 10:35 | |

REMARKS: WIC # 204-5508-0703

REPORT TO: Kay Pannell

EXCELTECH
41674 Christy Street
Fremont, C.A. 94538-3114
(415) 659-0404
Fax (415) 651-4677
Contr. Lic. No. 550205

FORM DATED 3-27-90