**Weiss Associates** Environmental and Geologic Services

5500 Shellmound Street, Emeryville, CA 94608-2411 Fax: 510-547-5043 Phone: **510-450-6000**

March 3, 1994

Britt Johnson
Alameda County Department of
Environmental Health
80 Swan Way, Room 200
Oakland, CA 94621

Re: Shell Service Station
WIC #204-0079-0109
999 San Pablo Avenue
Albany, California
WA Job #81-699-104

Dear Mr. Johnson:

This letter describes recently completed and anticipated activities at the Shell service station referenced above (Figure 1). This status report satisfies the quarterly reporting requirements prescribed by California Administrative Code Title 23 Waters, Chapter 3, Subchapter 16, Article 5, Section 265.d. Included below are descriptions and results of activities performed in the first quarter 1994 and proposed work for the second quarter 1994.

First Quarter 1994 Activities:

- Blaine Tech Services, Inc. (BTS) of San Jose, California measured ground water depths and collected ground water samples from the site wells. Well S-5 contained 1.90 ft of floating hydrocarbons and was not sampled. BTS' report describing these activities and the analytic report for the ground water samples are included as Attachment A.
- Weiss Associates (WA) calculated ground water elevations and compiled the analytic data (Tables 1 and 2), compiled a recommended Ground Water Sampling Frequency Table (Table 3) and prepared a ground water elevation contour map (Figure 2).

Anticipated Second Quarter 1994 Activities:

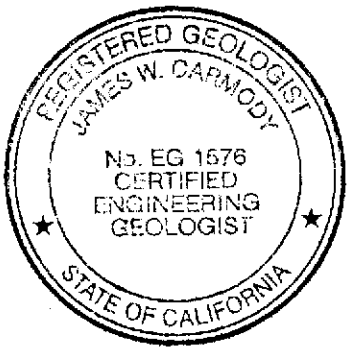
WA will submit a report presenting the results of the second quarter 1994 ground water sampling and ground water depth measurements. The report will include tabulated chemical analytic results, ground water elevations and a ground water elevation contour map.

Conclusions and Recommendations:

- Since the floating hydrocarbons measured in monitoring well S-5 appear to originate from the Arco Station across Marin Avenue south of the Shell site, WA does not intend to install a hydrocarbon skimmer or bail floating hydrocarbons from monitoring well S-5.

- Hydrocarbon concentrations in ground water have remained stable over the past year. Therefore, WA recommends implementing the sampilng frequencies presented in Table 3. If we do not hear from you within 30 days we will begin the sampling frequency reductions starting 2nd quarter 1994.

Please call if you have any questions.




Sincerely,
Weiss Associates

John Wolf
Technical Assistant

James W. Carmody, C.E.G.
Senior Project Hydrogeologist

JAW/JWC:jaw

J:\SHELL\650\699QMFE4.WP

Attachments: A - Blaine Tech's Ground Water Monitoring Report

cc: Dan Kirk, Shell Oil Company, P.O. Box 5278, Concord, California 94520-9998
Richard Heitt, Regional Water Quality Control Board - San Francisco Bay Region, 2101 Webster Street, Suite 500, Oakland, California 94612

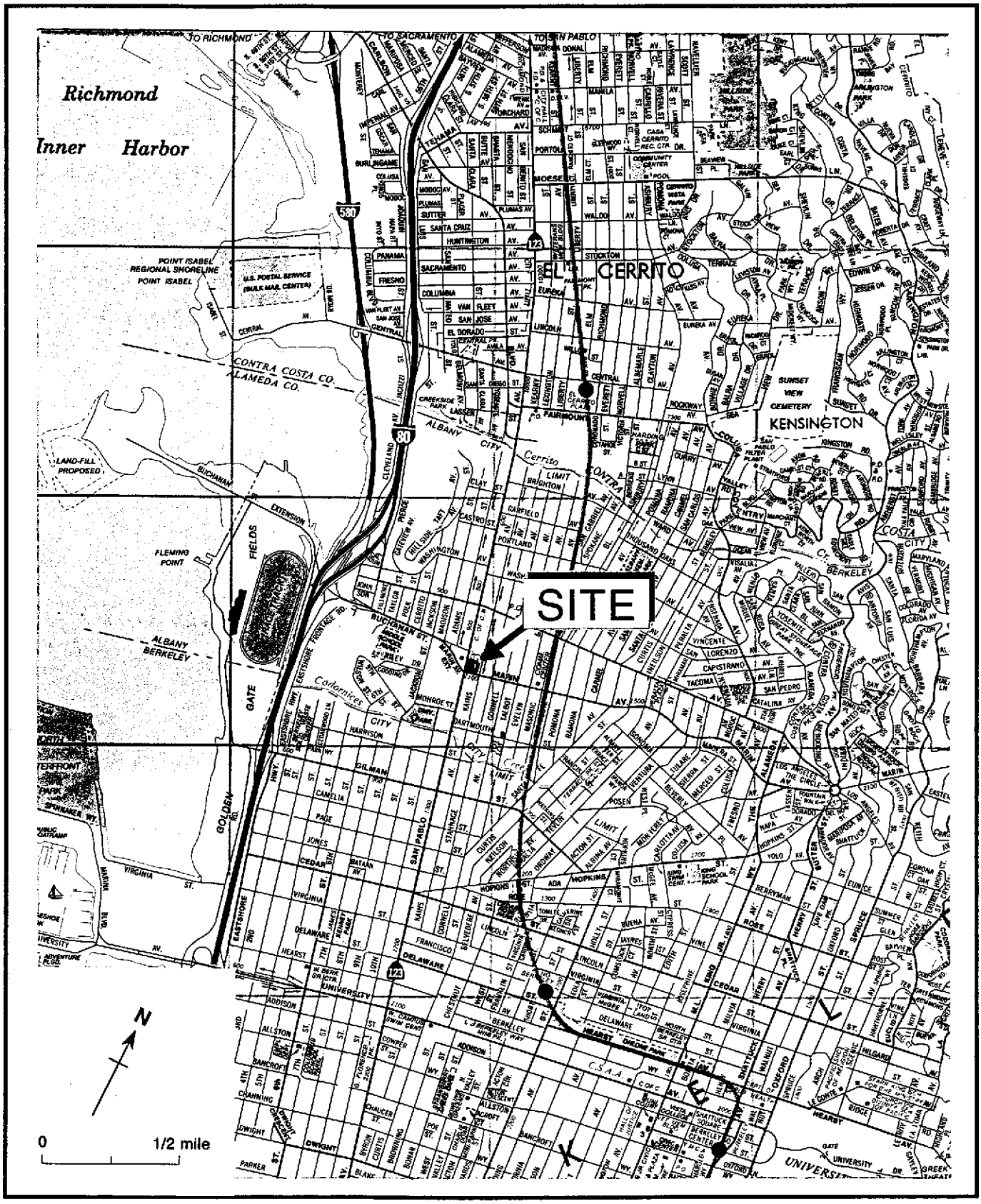



Figure 1. Site Location Map - Shell Service Station WIC #204-0079-0109, 999 San Pablo Avenue, Albany, California

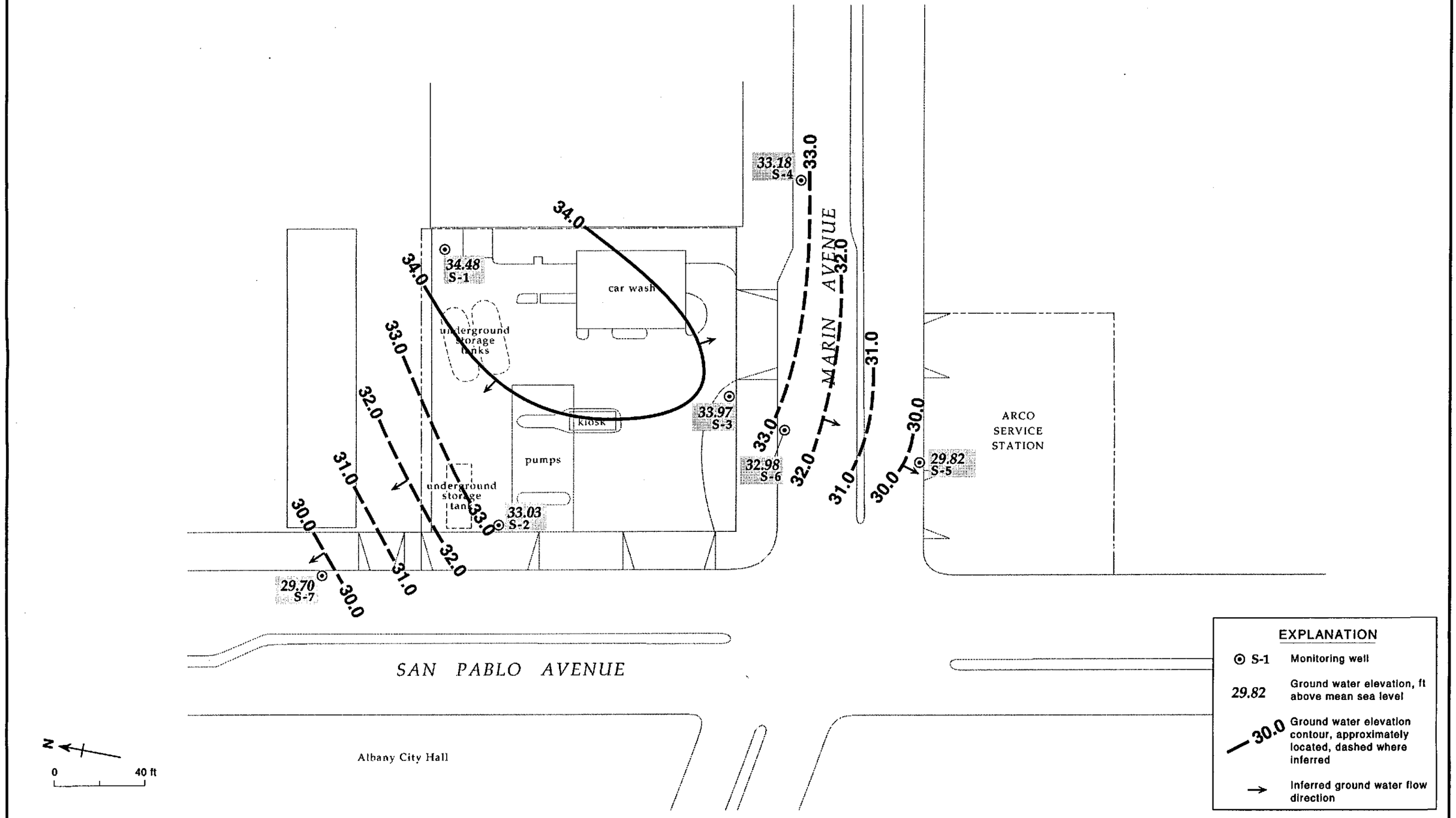



Figure 2. Monitoring Well Locations and Ground Water Elevation Contours - January 4, 1993- Shell Service Station WIC #204-0079-0109, 999 San Pablo Avenue, Albany, California

Table 1. Ground Water Elevations - Shell Service Station WIC #204-0079-0109, 999 San Pablo Avenue, Albany, California

| Well ID | Date | Top-of-Vault Elevation | Depth to Water (ft) | Floating Hydrocarbon Thickness (ft)[a] | Ground Water Elevation (ft above msl) |
|---|---|---|---|---|---|
| S-1 | 05/06/92 | 42.73 | 7.95 | --- | 34.78 |
| | 08/26/92 | | 8.24 | --- | 34.49 |
| | 10/28/92 | | 8.52 | --- | 34.21 |
| | 01/19/93 | | 6.54 | --- | 36.19 |
| | 04/29/93 | | 7.93 | --- | 34.80 |
| | 07/22/93 | | 8.09 | --- | 34.64 |
| | 10/21/93 | | 9.43 | --- | 33.30 |
| | **01/04/94** | | **8.25** | **---** | **34.48** |
| S-2 | 05/06/92 | 40.73 | 8.10 | --- | 32.63 |
| | 08/26/92 | | 8.37 | --- | 32.36 |
| | 10/28/92 | | 8.64 | --- | 32.09 |
| | 01/19/93 | | 5.82 | --- | 34.91 |
| | 04/29/93 | | 7.70 | --- | 33.03 |
| | 07/22/93 | | 8.38 | --- | 32.35 |
| | 10/21/93 | | 8.58 | --- | 32.15 |
| | **01/04/94** | | **7.70** | **---** | **33.03** |
| S-3 | 05/06/92 | 41.46 | 7.55 | --- | 33.91 |
| | 08/26/92 | | 7.53 | --- | 33.93 |
| | 10/28/92 | | 7.95 | --- | 33.51 |
| | 01/19/93 | | 6.12 | --- | 35.34 |
| | 04/29/93 | | 7.27 | --- | 34.19 |
| | 07/22/93 | | 7.62 | --- | 33.84 |
| | 10/21/93 | | 7.81 | --- | 33.65 |
| | **01/04/94** | | **7.49** | **---** | **33.97** |
| S-4 | 05/06/92 | 41.10 | 7.21 | --- | 33.89 |
| | 08/26/92 | | 8.13 | --- | 32.97 |
| | 10/28/92 | | 8.73 | --- | 32.37 |
| | 01/19/93 | | 5.86 | --- | 35.24 |
| | 04/29/93 | | 7.02 | --- | 34.08 |
| | 07/22/93 | | 7.76 | --- | 33.34 |
| | 10/21/93 | | 8.53 | --- | 32.57 |
| | **01/04/94** | | **7.92** | **---** | **33.18** |
| S-5 | 05/06/92 | 39.99 | 14.31 | 5.66 | 30.21 |
| | 08/26/92 | | 14.26 | 3.80 | 28.77 |
| | 10/28/92 | | 14.22 | 3.81 | 28.82 |
| | 01/19/93 | | 12.36 | 3.96 | 30.80 |

-- Table 1 continues on next page --

Table 1. Ground Water Elevations - Shell Service Station WIC #204-0079-0109, 999 San Pablo Avenue, Albany, California (continued)

| Well ID | Date | Top-of-Vault Elevation | Depth to Water (ft) | Floating Hydrocarbon Thickness (ft)[a] | Ground Water Elevation (ft above msl) |
|---|---|---|---|---|---|
| | 04/29/93 | | 9.64 | 0.90 | 31.07 |
| | 07/22/93 | | 9.55 | 0.90 | 31.16 |
| | 10/21/93 | | 11.23 | 0.73 | 29.34 |
| | **01/04/94** | | **11.69** | **1.90** | **29.82** |
| S-6 | 05/06/92 | 40.12 | 8.27 | --- | 32.85 |
| | 08/26/92 | | 9.57 | --- | 31.55 |
| | 10/28/92 | | 8.90 | --- | 32.22 |
| | 01/19/93 | | 4.84 | --- | 35.28 |
| | 04/29/93 | | 5.61 | --- | 34.51 |
| | 07/22/93 | | 6.56 | --- | 33.56 |
| | 10/21/93 | | 8.73 | --- | 31.39 |
| | **01/04/94** | | **7.14** | **---** | **32.98** |
| S-7 | 05/06/92 | 40.10 | 10.34 | --- | 29.76 |
| | 08/26/92 | | 11.13 | --- | 28.97 |
| | 10/28/92 | | 11.52 | --- | 28.58 |
| | 01/19/93 | | 8.68 | --- | 31.42 |
| | 04/29/93 | | 9.90 | --- | 30.20 |
| | 07/22/93 | | --- | --- | --- |
| | 10/21/93 | | 11.10 | --- | 29.00 |
| | **01/04/94** | | **10.40** | **---** | **29.70** |

Notes:

a = When floating hydrocarbons are present, ground water elevation corrected by the relation: corrected ground water elevation = (top-of-box elevation) - (depth to water) + (0.8 x floating hydrocarbon thickness)

Table 2. Analytic Results for Ground Water, Former Shell Service Station, WIC #204-0079-0109, 999 San Pablo Avenue, Albany, California

| Sample ID | Date | Depth to Water (ft) | TPH-G | B | E | T | X |
|---|---|---|---|---|---|---|---|
| | | | <----------parts per billion (ug/L)----------> | | | | |
| WELLS | | | | | | | |
| S-1 | 05/06/92 | 7.95 | 1,200 | 5.5 | 80 | <2.5 | 36 |
| | 07/29/93 | 8.24 | 2,000 | 9.4 | 130 | <2.5 | <2.5 |
| | 10/28/92 | 8.52 | 1,300 | 27 | 72 | 3.2 | 13 |
| | 01/19/93 | 6.54 | 1,500 | 13 | 29 | 3 | 31 |
| | 04/29/93 | 7.93 | 2,000 | 15 | 82 | <2.5 | <65 |
| | 07/22/93 | 8.09 | 620 | 1.1 | 3.5 | 4.2 | 13 |
| | 10/21/93 | 9.43 | 1,200 | 34 | 15 | 25 | 9.5 |
| | **01/04/94** | **8.25** | **860** | **<2.5** | **5.7** | **<2.5** | **5.3** |
| S-2 | 05/06/92 | 8.10 | 20,000 | 2,600 | 860 | 110 | 1,900 |
| | 07/29/92 | 8.37 | 42,000 | 5,000 | 1,100 | 160 | 3,500 |
| | 10/28/92 | 8.64 | 34,000 | 4,800 | 1,600 | 330 | 2,900 |
| | 01/19/93 | 5.82 | 20,000 | 2,300 | 660 | 370 | 1,300 |
| | 04/29/93 | 7.70 | 40,000 | 2,000 | 900 | 67 | 1,900 |
| | 07/22/93 | 8.38 | 22,000 | 3,000 | 1,000 | 120 | 1,600 |
| | 07/22/93[dup] | 8.38 | 17,000 | 3,000 | 1,000 | 110 | 1,500 |
| | 10/21/93 | 8.58 | 14,000 | 2,800 | 870 | 74 | 1,100 |
| | 10/21/93[dup] | 8.58 | 13,000 | 3,200 | 960 | 53 | 820 |
| | **01/04/94** | **7.70** | **21,000** | **2,100** | **990** | **67** | **770** |
| | **01/04/94[dup]** | **7.70** | **22,000** | **2,000** | **910** | **64** | **750** |
| S-3 | 05/06/92 | 7.55 | 6,600 | 38 | 45 | 51 | 65 |
| | 07/29/92 | 7.53 | 5,800 | 18 | 29 | 12 | 60 |
| | 10/28/92 | 7.95 | 3,000 | 55 | 16 | 11 | 32 |
| | 01/19/93 | 6.12 | 3,100 | <5 | 11 | 5.1 | 16 |
| | 04/29/93 | 7.27 | 3,000 | 31 | <5 | 22 | 14 |
| | 07/22/93 | 7.62 | 2,600 | 3.1 | 23 | 43 | 53 |
| | 10/21/93 | 7.81 | 2,500 | 73 | 16 | 14 | 32 |
| | **01/04/94** | **7.49** | **4,800** | **13** | **<12.5** | **21** | **33** |
| S-4 | 05/06/92 | 7.21 | 54 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 07/29/92 | 8.13 | 67 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 10/28/92 | 8.73 | <50 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 01/19/93 | 5.86 | 86 | 1.2 | 2.7 | 0.7 | 15 |
| | 04/29/93 | 7.02 | <50 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 04/29/93[dup] | 7.02 | <50 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 07/22/93 | 7.76 | <50 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 10/21/93 | 8.53 | <50 | <0.5 | <0.5 | <0.5 | <0.5 |
| | **01/04/94** | **7.92** | **<50** | **<0.5** | **<0.5** | **<0.5** | **<0.5** |
| S-5 | 05/06/92[FHC] | 14.31 | --- | --- | --- | --- | --- |
| | 07/29/92[FHC] | 14.26 | --- | --- | --- | --- | --- |

-- Table 2 continues on next page --

Table 2. Analytic Results for Ground Water, Former Shell Service Station, WIC #204-0079-0109, 999 San Pablo, Albany, California (continued)

| Sample ID | Date | Depth to Water (ft) | TPH-G | B | E | T | X |
|---|---|---|---|---|---|---|---|
| | | | <----------parts per billion (ug/L)----------> | | | | |
| | 10/28/92[FHC] | 14.22 | --- | --- | --- | --- | --- |
| | 01/19/93[FHC] | 12.36 | --- | --- | --- | --- | --- |
| | 04/29/93[FHC] | 9.64 | --- | --- | --- | --- | --- |
| | 07/22/93[FHC] | 9.55 | --- | --- | --- | --- | --- |
| | 10/21/93[FHC] | 11.23 | --- | --- | --- | --- | --- |
| | **01/04/94[FHC]** | **11.69** | --- | --- | --- | --- | --- |
| S-6 | 05/06/92 | 8.27 | 7,100 | 330 | 110 | 29 | 210 |
| | 07/29/92 | 9.57 | 13,000 | 240 | 56 | <50 | 780 |
| | 10/28/92 | 8.90 | 10,000 | 470 | 67 | 210 | 170 |
| | 01/19/93 | 4.84 | 4,800 | 100 | 27 | 26 | 45 |
| | 04/29/93 | 5.61 | 7,000 | 430 | <12.5 | 20 | 42 |
| | 07/22/93 | 6.56 | 5,800 | 260 | 65 | 120 | 150 |
| | 10/21/93 | 8.73 | 5,500 | 270 | 120 | 69 | 140 |
| | **01/04/94** | **7.14** | **7,100** | **180** | **63** | **58** | **62** |
| S-7 | 05/06/92 | 10.34 | <50 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 07/29/92 | 11.13 | 160 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 10/28/92 | 11.52 | <50 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 01/19/93 | 8.68 | 50 | 1.1 | 1.9 | 0.6 | 9.2 |
| | 04/29/93 | 9.90 | <50 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 07/22/93[a] | --- | --- | --- | --- | --- | --- |
| | 10/21/93 | 11.10 | <50 | <0.5 | <0.5 | <0.5 | <0.5 |
| | **01/04/94** | **10.40** | **<50** | **<0.5** | **<0.5** | **<0.5** | **<0.5** |
| Trip Blank | 04/29/93 | | <50 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 07/22/93 | | <50 | <0.5 | <0.5 | <0.5 | <0.5 |
| | 10/21/93 | | <50 | <0.5 | <0.5 | <0.5 | <0.5 |
| | **01/04/94** | | **<50** | **<0.5** | **<0.5** | **<0.5** | **<0.5** |
| DTSC MCLs | | | NE | 1 | 680 | 10[b] | 1,750 |

-- Table 2 continues on next page --

Table 2. Analytic Results for Ground Water, Former Shell Service Station, WIC #204-0079-0109, 999 San Pablo, Albany, California (continued)

Abbreviations:

TPH-G = Total petroleum hydrocarbons as gasoline by Modified EPA Method 8015
B = Benzene by EPA Method 8020
E = Ethylbenzene by EPA Method 8020
T = Toluene by EPA Method 8020
X = Xylenes by EPA Method 602 or 8020
--- = Not analyzed
DTSC MCLs = California Department of Toxic Substances Control maximum contaminant levels for drinking water
NE = Not established
<n = Not detected at detection limits of n ppb
dup = Duplicate sample
FHC = Floating hydrocarbons detected, no sample collected

Notes:

a = Well inaccessible
b = DTSC recommended action level for drinking water; MCL not established

Table 3. Recommended Sampling Frequency Modifications for Ground Water Monitoring Wells - Shell Service Station WIC #204-0079-0109, 999 San Pablo Avenue, Albany, California

| Monitoring Well | Current Sampling Frequency | Recommended Sampling Frequency | Rational for Recommended Sampling Frequency |
|---|---|---|---|
| S-1 | Qtrly | Biannually | Up and crossgradient well, stable hydrocarbon concentrations for 14 quarters |
| S-2 | Qtrly | Biannually | Intermediate well, stable hydrocarbon concentrations for 14 quarters |
| S-3 | Qtrly | Biannually | Intermediate well, stable hydrocarbon concentrations for 14 quarters |
| S-4 | Qtrly | Annually | Upgradient well, hydrocarbon concentrations near or below MCLs for 13 quarters |
| S-5 | Qtrly | Qtrly | Downgradient well |
| S-6 | Qtrly | Biannually | Intermediate well, stable hydrocarbon concentrations for 12 quarters |
| S-7 | Qtrly | Qtrly | Clean downgradient well |

## SAMPLING FREQUENCY CRITERIA

Weiss Associates (WA) has developed a technical approach for determining appropriate ground water monitoring well sampling frequencies for service station monitoring programs. Ground water monitoring wells are typically sampled quarterly at service stations to monitor the concentration and extent of hydrocarbons and/or volatile organic compounds (VOCs) in ground water. This satisfies California Regional Water Quality Control Board (RWQCB) ground water monitoring guidelines which state: "Quarterly (ground water) monitoring is the maximum sampling interval typically allowed when ground water contamination is present unless other arrangements are made with Regional (Water Quality Control) Board staff"[1]. San Francisco Bay RWQCB personnel have indicated that the RWQCB will allow well sampling frequency reductions on a site specific basis if the frequency reductions are justified by site conditions. Presented below are generalized criteria we have developed for determining the appropriate well sampling frequencies based on specific site conditions.

## CRITERIA FOR REDUCING SAMPLING FREQUENCY

The generalized criteria we have developed for determining whether sampling frequency should be modified for a given well includes:

- The reliability of the ground water analytic data,
- The trend of the dissolved hydrocarbon and/or VOCs concentrations in the well, and
- The location of the well in relation to the hydrocarbon and/or VOCs source.

Each of these factors is discussed below.

### Reliability of Ground Water Analytic Data

The reproducibility of ground water analytic data is highly sensitive to geologic conditions, ground water elevations, field sampling procedures and laboratory analytic procedures. Of these controlling factors, ground water fluctuations usually have the greatest impact on data reproducibility. Since ground water elevations at most sites fluctuate during

---

[1] North Coast, San Francisco Bay, Central Valley Regional Water Quality Control Boards, June 2, 1988 (revised May 18, 1989), "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks; pg. 12

the course of a year, ground water should be monitored for at least one year to assess the impact of ground water fluctuations on data reproducibility. RWQCB guidelines also stipulate sampling all monitoring wells at least quarterly for one year when hydrocarbons are detected in the well. Therefore, WA recommends reducing the sampling frequency only for wells which:

- Have been sampled at least four times over a period of one year, and
- Have consistent historic analytic results allowing a reliable assessment of the representative hydrocarbon concentrations in the ground water.

Although it may be possible to statistically quantify the reliability of the analytic data, this effort may not produce useful results. Therefore, we will evaluate the reliability of the data subjectively. If the variability of the analytic data prevents a reliable assessment of concentrations then we recommend sampling the well(s) quarterly until a reliable assessment can be made.

Concentration Trends

Sampling frequency should be reduced only for wells showing stable or decreasing concentration trends. Wells showing increasing concentration trends should be sampled quarterly to monitor the trends and determine whether the hydrocarbon concentration in a particular well is approaching a threshold, such as the saturation concentration, maximum contaminant level (MCL) or the recommended action level.

Well Location

For most sites, four to ten ground water monitoring wells are typically required to fully define the extent of hydrocarbons in ground water. These wells generally fall into one of four classifications relative to the hydrocarbon source:

1) Clean upgradient and crossgradient wells,
2) Source-area wells with high hydrocarbon concentrations,
3) Intermediate wells with low to high hydrocarbon concentrations located between the source-area wells and clean crossgradient and downgradient wells, and
4) Clean downgradient wells.

WA's recommended sampling frequency for each of these classifications is as follows:

1) If no hydrocarbons are detected in the upgradient and crossgradient wells, and if no offsite sources are suspected upgradient or crossgradient of the site, WA recommends sampling these wells annually.

2) Source-area wells are used to monitor concentrations from source-area releases and determine effectiveness of natural biodegradation and/or site remediation. To ensure that increasing source-area concentration trends are detected, WA recommends sampling these wells biannually.

3) Intermediate wells are used to track dissolved hydrocarbon concentrations and the rates of natural biodegradation or the effectiveness of site remediation. Therefore, WA recommends sampling these wells biannually. However, if there are more than four intermediate wells, we recommend sampling each of the intermediate wells annually during different quarters.

4) Since clean downgradient wells define the "leading edge" of dissolved hydrocarbons in ground water and are used to determine hydrocarbon breakthrough, WA recommends sampling these wells quarterly.

Other Considerations

If hydrocarbon concentrations in ground water from all site wells are near or below MCLs, we recommend sampling all site wells biannually or annually, depending on the number of wells, well locations with respect to potential source areas, and ground water depth fluctuations. Annual sampling should be sufficient for sites with:

- Large numbers of wells,
- Wells located immediately downgradient of potential source areas, and
- Stable ground water depths.

Sites without these characteristics may need biannual sampling.

Upgradient and/or crossgradient wells that contain hydrocarbons or other contaminants from offsite sources should be sampled biannually to monitor offsite contributions of contaminants to the site.

A decision flow chart graphically presenting the recommended sampling frequency based on these criteria is included as Figure 1. Although there may be wells that do not fall into the location and concentration classifications listed in the flow chart, the generalized criteria may be used to evaluate the appropriate sampling frequency on a case by case basis.

SUMMARY

In summary, WA recommends reducing sampling frequencies for all ground water monitoring wells with:

- Ground water samples collected for four consecutive quarters,
- Reliable ground water analytic results, and
- No significantly increasing concentration trends.

The sampling frequency for individual wells should be modified based on the well location relative to the contaminant source, as follows:

- Annually for clean upgradient and crossgradient wells,
- Biannually for upgradient and crossgradient wells containing hydrocarbons or other contaminants from an offsite, upgradient source,
- Biannually for high concentration source-area wells,
- Biannually or annually for intermediate wells, depending on the total number of intermediate wells, and
- Quarterly for clean downgradient wells.

Sampling frequency in all site wells should also be reduced to biannual or annual if contaminant concentrations in all site wells are near or below MCLs.

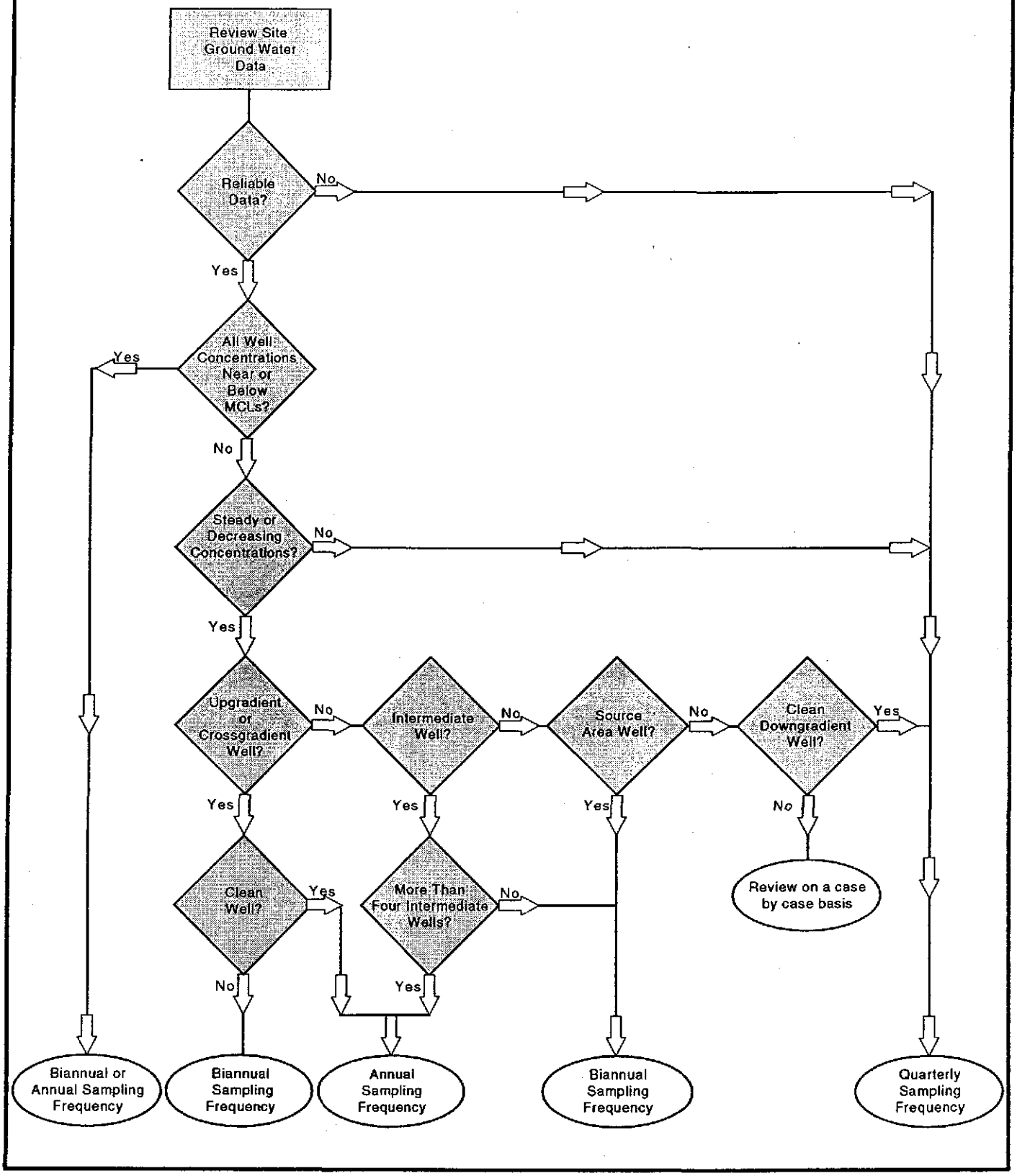



Figure 1. Ground Water Sampling Frequency Determination Chart

# ATTACHMENT A

GROUND WATER MONITORING REPORT AND ANALYTIC REPORT

BLAINE
TECH SERVICES INC.

985 TIMOTHY DRIVE
SAN JOSE, CA 95133
(408) 995-5535
FAX (408) 293-8773

January 25, 1994

Shell Oil Company
P.O. Box 5278
Concord, CA 94520-9998

Attn: Daniel T. Kirk



**SITE:**
Shell WIC #204-0079-0109
999 San Pablo Avenue
Albany, California

**QUARTER:**
1st Quarter of 1994

## QUARTERLY GROUNDWATER SAMPLING REPORT 940104-G-1

This report contains data collected during routine inspection, gauging and sampling of groundwater monitoring wells performed by Blaine Tech Services, Inc. in response to the request of the consultant who is overseeing work at this site on behalf of our mutual client, Shell Oil Company. Data collected in the course of our field work is presented in a TABLE OF WELL GAUGING DATA. The field information was collected during our preliminary gauging and inspection of the wells, the subsequent evacuation of each well prior to sampling, and at the time of sampling.

Measurements taken include the total depth of the well and the depth to water. The surface of water was further inspected for the presence of immiscibles which may be present as a thin film (a sheen on the surface of the water) or as a measurable free product zone (FPZ). At intervals during the evacuation phase, the purge water was monitored with instruments that measure electrical conductivity (EC), potential hydrogen (pH), temperature (degrees Fahrenheit), and turbidity (NTU). In the interest of simplicity, fundamental information is tabulated here, while the bulk of the information is turned over directly to the consultant who is making professional interpretations and evaluations of the conditions at the site.

## STANDARD PROCEDURES

### Evacuation

Groundwater wells are thoroughly purged before sampling to insure that the sample is collected from water that has been newly drawn into the well from the surrounding geologic formation. The selection of equipment to evacuate each well is based on the physical characteristics of the well and what is known about the performance of the formation in which the well has been installed. There are several suitable devices which can be used for evacuation. The most commonly employed devices are air or gas actuated pumps, electric submersible pumps, and hand or mechanically actuated bailers. Our personnel frequently employ USGS/Middleburg positive displacement pumps or similar air actuated pumps which do not agitate the water standing in the well.

Normal evacuation removes three-case volumes of water from the well. More than three-case volumes of water are removed in cases where more evacuation is needed to achieve stabilization of water parameters and when requested by the local implementing agency. Less than three-case volumes of water may be removed in cases where the well dewaters and does not recharge to 80% of its original volume within two hours and any additional time our personnel have reason to remain at the site. In such cases, our personnel return to the site within twenty-four hours and collect sample material from the water which has recharged into the well case.

### Decontamination

All apparatus is brought to the site in clean and serviceable condition. The equipment is decontaminated after each use and before leaving the site. Effluent water from purging and on-site equipment cleaning is collected and transported to Shell's Martinez Manufacturing Complex in Martinez, California.

### Free Product Skimmer

The column headed, VOLUME OF IMMISCIBLES REMOVED (ml) is included in the TABLE OF WELL GAUGING DATA to cover situations where a free product skimming device must be removed from the well prior to gauging. Skimmers are installed in wells with a free product zone on the surface of the water. The skimmer is a free product recovery device which often prevents normal well gauging and free product zone measurements. The 2.0" and 3.0" PetroTraps fall into the category of devices that obstruct normal gauging. In cases where the consultant elects to have our personnel pull the skimmers out of the well and gauge the well, our personnel perform the additional task of draining the accumulated free product out of the PetroTrap before putting it back in the well. This

recovered free product is measured and logged in the VOLUME OF IMMISCIBLES REMOVED column. Gauging at such site is performed in accordance with specific directions from the professional consulting firm overseeing work at the site on Shell's behalf.

**Sample Containers**

Sample material is collected in specially prepared containers which are provided by the laboratory that performs the analyses.

**Sampling**

Sample material is collected in stainless steel bailer type devices normally fitted with both a top and a bottom check valve. Water is promptly decanted into new sample containers in a manner which reduces the loss of volatile constituents and follows the applicable EPA standard for handling volatile organic and semi-volatile compounds.

Following collection, samples are promptly placed in an ice chest containing prefrozen blocks of an inert ice substitute such as Blue Ice or Super Ice. The samples are maintained in either an ice chest or a refrigerator until delivered into the custody of the laboratory.

**Sample Designations**

All sample containers are identified with a site designation and a discrete sample identification number specific to that particular groundwater well. Additional standard notations (e.g. time, date, sampler) are also made on the label. Either the requested analyses or the specific analytes are written on the sample label (e.g. TPH-G, BTEX).

**Chain of Custody**

Samples are continuously maintained in an appropriate cooled container while in our custody and until delivered to the laboratory under a standard Shell Oil Company Chain of Custody. If the samples are taken charge of by a different party (such as another person from our office, a courier, etc.) prior to being delivered to the laboratory, appropriate release and acceptance records are made on the Chain of Custody (time, date, and signature of the person releasing the samples followed by the time, date and signature of the person accepting custody of the samples).

**Hazardous Materials Testing Laboratory**

The samples obtained at this site were delivered to Anametrix, Inc. in San Jose, California. Anametrix, Inc. is a California Department of Health Services certified Hazardous Materials Testing Laboratory and is listed as DOHS HMTL #1234.

**Objective Information Collection**

Blaine Tech Services, Inc. performs specialized environmental sampling and documentation as an independent third party. In order to avoid compromising the objectivity necessary for the proper and disinterested performance of this work, Blaine Tech Services, Inc. performs no consulting and does not become involved in the marketing or installation of remedial systems of any kind. Blaine Tech Services, Inc. is concerned only with the generation of objective information, not with the use of that information to support evaluations and recommendations concerning the environmental condition of the site. Even the straightforward interpretation of objective analytical data is better performed by interested regulatory agencies and those engineers and geologists who are engaged in the work of providing professional opinions about the site and proposals to perform additional investigation or design remedial systems.

**Reportage**

Submission of this report and the attached laboratory report to interested regulatory agencies is handled by the consultant in charge of the project. Any professional evaluations or recommendations will be made by the consultant under separate cover.

Please call if we can be of any further assistance.

Richard C. Blaine

RCB/mla

Attachments: Table of Well Gauging Data
Chain of Custody
Certified Analytical Report

cc: Weiss Associates
5500 Shellmound Street
Emeryville, CA 94608-2411
ATTN: Michael Asport

# TABLE OF WELL GAUGING DATA

| WELL I.D. | DATA COLLECTION DATE | MEASUREMENT REFERENCED TO | QUALITATIVE OBSERVATIONS (sheen) | DEPTH TO FIRST IMMISCIBLES LIQUID (FPZ) (feet) | THICKNESS OF IMMISCIBLES LIQUID ZONE (feet) | VOLUME OF IMMISCIBLES REMOVED (ml) | DEPTH TO WATER (feet) | DEPTH TO WELL BOTTOM (feet) |
|---|---|---|---|---|---|---|---|---|
| S-1 | 1/4/94 | TOB | -- | NONE | -- | -- | 8.25 | 11.93 |
| S-2 * | 1/4/94 | TOB | SHEEN/ODOR | -- | -- | -- | 7.70 | 12.11 |
| S-3 | 1/4/94 | TOB | -- | NONE | -- | -- | 7.49 | 12.18 |
| S-4 | 1/4/94 | TOB | -- | NONE | -- | -- | 7.92 | 14.19 |
| S-5 | 1/4/94 | TOB | FREE PRODUCT | 9.79 | 1.90 | 0.00 | 11.69 | -- |
| S-6 | 1/4/94 | TOB | ODOR | NONE | -- | -- | 7.14 | 15.20 |
| S-7 | 1/4/94 | TOB | -- | NONE | -- | -- | 10.40 | 15.03 |

* Sample DUP was a duplicate sample taken from well S-2.

# 748 9401056 (18)

## SHELL OIL COMPANY
RETAIL ENVIRONMENTAL ENGINEERING - WEST

## CHAIN OF CUSTODY RECORD
Serial No: 940104 G1

Date:
Page 1 of 1

Site Address: 999 San Pablo Ave., Albany

WIC#: 204-0079-0109

Shell Engineer: Dan Kirk — Phone No.: (510) 675-6168 Fax #: 675-6160

Consultant Name & Address: Blaine Tech Services, Inc. 985 Timothy Drive San Jose, CA 95133

Consultant Contact: Jim Keller — Phone No.: (408) 995-5535 Fax #: 293-8773

Comments:

Sampled by: Gregg Friedrich

Printed Name:

LAB: Anametrix

| CHECK ONE (1) BOX ONLY | C1/D1 |
|---|---|
| Quarterly Monitoring | X 8441 |
| Site Investigation | 8441 |
| Soil Closure/Disposal | 8442 |
| Water Closure/Disposal | 8443 |
| Soil/Air Rem. or Sys. O & M | 8462 |
| Water Rem. or Sys. O & M | 8463 |
| Other | |

TURN AROUND TIME: 24 hours ☐ 48 hours ☐ 15 days X (Normal) Other ☐ ____

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

| | Sample ID | Date | Sludge | Soil | Water | Air | No. of conts. | TPH (EPA 8015 Mod. Gas) | TPH (EPA 8015 Mod. Diesel) | BTEX (EPA 8020/602) | Volatile Organics (EPA 8240) | Test for Disposal | Combination TPH 8015 & BTEX 8020 | | | Asbestos | Container Size | Preparation Used | Composite Y/N | MATERIAL DESCRIPTION | SAMPLE CONDITION/ COMMENTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | S-1 Time 1410 | 1-4-94 | | | X | | 3 | | | | | | X | | | | 40ml | HCl | N | | |
| 2 | S-2 1520 | | | | | | 3 | | | | | | | | | | | | | | |
| 3 | S-3 1430 | | | | | | 3 | | | | | | | | | | | | | | |
| 4 | S-4 1345 | | | | | | 3 | | | | | | | | | 1 | | | | | |
| 5 | S-5 1500 | | | | | | 3 | | | | | | | | | | | | | | |
| 6 | S-7 1320 | | | | | | 3 | | | | | | | | | | | | | | |
| 7 | TB — | | | | | | 2 | | | | | | | | | | | | | | |
| 8 | Dup — | | | | | | 3 | | | | | | | | | | | | | | |

| | Printed Name: | Date: | Time: | | Printed Name: | Date: | Time: |
|---|---|---|---|---|---|---|---|
| Relinquished By (signature): | Gregg A Friedrich | 1-4-94 | 1955 | Received (signature): | BENNY S. CARRIZOSA | 1-5-94 | 1055 |
| Relinquished By (signature): | BENNY S. CARRIZOSA | 1-5-94 | 1135 | Received (signature): | | 1/6/94 | 1135 |
| Relinquished By (signature): | Printed Name: | Date: | Time: | Received (signature): | Printed Name: | Date: | Time: |

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

# Inchcape Testing Services
## Anametrix Laboratories

1961 Concourse Drive
Suite E
San Jose, CA 95131
Tel: 408-432-8192
Fax: 408-432-8198


MR. JIM KELLER
BLAINE TECH
985 TIMOTHY DRIVE
SAN JOSE, CA 95133

Workorder # : 9401056
Date Received : 01/06/94
Project ID : 204-0079-0109
Purchase Order: MOH-B813

The following samples were received at Anametrix for analysis :

| ANAMETRIX ID | CLIENT SAMPLE ID |
|---|---|
| 9401056- 1 | S-1 |
| 9401056- 2 | S-2 |
| 9401056- 3 | S-3 |
| 9401056- 4 | S-4 |
| 9401056- 5 | S-6 |
| 9401056- 6 | S-7 |
| 9401056- 7 | TB |
| 9401056- 8 | DUP |

This report consists of 6 pages not including the cover letter, and is organized in sections according to the specific Anametrix laboratory group which performed the analysis(es) and generated the data.

The results contained within this report relate to only the sample(s) tested. Additionally, these data should be considered in their entirety and Anametrix cannot be responsible for the detachment, separation, or otherwise partial use of this report.

Anametrix is certified by the California Department of Health Services (DHS) to perform environmental testing under Certificate Number 1234.

If you have any further questions or comments on this report, please call us as soon as possible. Thank you for using Anametrix.

Corinne Ham for
Sarah Schoen, Ph.D.
Laboratory Director

1/20/94
Date

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MR. JIM KELLER
BLAINE TECH
985 TIMOTHY DRIVE
SAN JOSE, CA 95133

Workorder # : 9401056
Date Received : 01/06/94
Project ID : 204-0079-0109
Purchase Order: MOH-B813
Department : GC
Sub-Department: TPH

SAMPLE INFORMATION:

| ANAMETRIX SAMPLE ID | CLIENT SAMPLE ID | MATRIX | DATE SAMPLED | METHOD |
|---|---|---|---|---|
| 9401056- 1 | S-1 | WATER | 01/04/94 | TPHgBTEX |
| 9401056- 2 | S-2 | WATER | 01/04/94 | TPHgBTEX |
| 9401056- 3 | S-3 | WATER | 01/04/94 | TPHgBTEX |
| 9401056- 4 | S-4 | WATER | 01/04/94 | TPHgBTEX |
| 9401056- 5 | S-6 | WATER | 01/04/94 | TPHgBTEX |
| 9401056- 6 | S-7 | WATER | 01/04/94 | TPHgBTEX |
| 9401056- 7 | TB | WATER | 01/04/94 | TPHgBTEX |
| 9401056- 8 | DUP | WATER | 01/04/94 | TPHgBTEX |

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MR. JIM KELLER
BLAINE TECH
985 TIMOTHY DRIVE
SAN JOSE, CA 95133

Workorder # : 9401056
Date Received : 01/06/94
Project ID : 204-0079-0109
Purchase Order: MOH-B813
Department : GC
Sub-Department: TPH

QA/QC SUMMARY :

- No QA/QC problems encountered for these samples.

Cheryl Balmer 1/18/94
Department Supervisor Date

Reggie Davison 1/19/94
Chemist Date

# Organic Analysis Data Sheet
## Total Petroleum Hydrocarbons as Gasoline with BTEX
## ITS - Anametrix Laboratories - (408)432-8192

Lab Workorder : 9401056 | Client Project ID : 204-0079-0109

Matrix : WATER | Units : ug/L

| Compound Name | Method Reporting Limit* | Client ID S-1 Lab ID 9401056-01 | Client ID S-2 Lab ID 9401056-02 | Client ID S-3 Lab ID 9401056-03 | Client ID S-4 Lab ID 9401056-04 | Client ID S-6 Lab ID 9401056-05 |
|---|---|---|---|---|---|---|
| Benzene | 0.50 | <2.5 | 2100 | 13 | ND | 180 |
| Toluene | 0.50 | <2.5 | 67 | 21 | ND | 58 |
| Ethylbenzene | 0.50 | 5.7 | 990 | <12.5 | ND | 63 |
| Total Xylenes | 0.50 | 5.3 | 770 | 33 | ND | 62 |
| TPH as Gasoline | 50 | 860 | 21000 | 4800 | ND | 7100 |
| Surrogate Recovery | | 110% | 123% | 104% | 100% | 129% |
| Instrument ID | | HP4 | HP4 | HP4 | HP4 | HP4 |
| Date Sampled | | 01/04/94 | 01/04/94 | 01/04/94 | 01/04/94 | 01/04/94 |
| Date Analyzed | | 01/12/94 | 01/13/94 | 01/14/94 | 01/12/94 | 01/13/94 |
| RLMF | | 5 | 50 | 25 | 1 | 10 |
| Filename Reference | | FPJ05601.D | FPJ05602.D | FRJ05603.D | FPJ05604.D | FPJ05605.D |

* The Method Reporting Limit must be multiplied by the Reporting Limit Multiplication Factor (RLMF) to achieve the compound's reporting limit in the analysis.

ND : Not detected at or above the reporting limit for the analysis as performed.
TPHg : Determined by GC/FID following sample purge & trap by EPA Method 5030.
BTEX : Determined by modified EPA Method 8020 following sample purge & trap by EPA Method 5030.

Lab Control Limits for surrogate compound p-Bromofluorobenzene are 61-139%.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Peggie Davison 1/19/94
Analyst Date

Cheryl Baerman 1/19/94
Supervisor Date



Issued on 1/19/94 @ 7:16 AM

# Organic Analysis Data Sheet
## Total Petroleum Hydrocarbons as Gasoline with BTEX
## ITS - Anametrix Laboratories - (408)432-8192

Lab Workorder : 9401056 | Client Project ID : 204-0079-0109

Matrix : WATER | Units : ug/L

| Compound Name | Method Reporting Limit* | Client ID<br>S-7<br>Lab ID<br>9401056-06 | Client ID<br>TB<br>Lab ID<br>9401056-07 | Client ID<br>DUP<br>Lab ID<br>9401056-08 | Client ID<br><br>Lab ID<br>Method Blank | Client ID<br><br>Lab ID<br>Method Blank |
|---|---|---|---|---|---|---|
| Benzene | 0.50 | ND | ND | 2000 | ND | ND |
| Toluene | 0.50 | ND | ND | 64 | ND | ND |
| Ethylbenzene | 0.50 | ND | ND | 910 | ND | ND |
| Total Xylenes | 0.50 | ND | ND | 750 | ND | ND |
| TPH as Gasoline | 50 | ND | ND | 22000 | ND | ND |
| Surrogate Recovery | | 104% | 100% | 121% | 93% | 92% |
| Instrument ID | | HP4 | HP4 | HP4 | HP4 | HP4 |
| Date Sampled | | 01/04/94 | 01/04/94 | 01/04/94 | N/A | N/A |
| Date Analyzed | | 01/12/94 | 01/12/94 | 01/13/94 | 01/12/94 | 01/14/94 |
| RLMF | | 1 | 1 | 50 | 1 | 1 |
| Filename Reference | | FPJ05606.D | FPJ05607.D | FPJ05608.D | BJ1201E1.D | BJ1402E1.D |

* The Method Reporting Limit must be multiplied by the Reporting Limit Multiplication Factor (RLMF) to achieve the compound's reporting limit in the analysis.

ND : Not detected at or above the reporting limit for the analysis as performed.
TPHg : Determined by GC/FID following sample purge & trap by EPA Method 5030.
BTEX : Determined by modified EPA Method 8020 following sample purge & trap by EPA Method 5030.

Lab Control Limits for surrogate compound p-Bromofluorobenzene are 61-139%.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Reggie Davidson 1/19/94
Analyst Date

Cheryl Barnes 1/19/94
Supervisor Date

# Laboratory Control Spike Report
## Total Petroleum Hydrocarbons as BTEX
## ITS - Anametrix Laboratories - (408)432-8192

Instrument ID : HP4
Matrix : LIQUID

Analyst : RD
Supervisor : [illegible]
Units : ug/L

| COMPOUND NAME | SPIKE AMOUNT | LCS RECOVERY | RECOVERY LIMITS |
|---|---|---|---|
| Benzene | 20 | 110% | 52-133 |
| Toluene | 20 | 105% | 57-136 |
| Ethylbenzene | 20 | 110% | 56-139 |
| Total Xylenes | 20 | 105% | 56-141 |
| Surrogate Recovery | | 111% | 61-139 |
| Date Analyzed | | 01/12/94 | |
| Multiplier | | 1 | |
| Filename Reference | | MJ1201E1.D | |

* Limits established by Inchcape Testing Services, Anametrix Laboratories.

# Laboratory Control Spike Report
## Total Petroleum Hydrocarbons as BTEX
## ITS - Anametrix Laboratories - (408)432-8192

Instrument ID : HP4
Matrix : LIQUID

Analyst : RD
Supervisor : [illegible]
Units : ug/L

| COMPOUND NAME | SPIKE AMOUNT | LCS RECOVERY | RECOVERY LIMITS |
|---|---|---|---|
| Benzene | 20 | 125% | 52-133 |
| Toluene | 20 | 130% | 57-136 |
| Ethylbenzene | 20 | 135% | 56-139 |
| Total Xylenes | 20 | 125% | 56-141 |
| Surrogate Recovery | | 100% | 61-139 |
| Date Analyzed | | 01/14/94 | |
| Multiplier | | 1 | |
| Filename Reference | | MJ1401E1.D | |

* Limits established by Inchcape Testing Services, Anametrix Laboratories.