**GeoStrategies Inc.**
2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545
(510) 352-4800

October 23, 1991

County of Alameda
Department of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, California 94621

Reference: Former Shell Service Station
461 Eighth Street
Oakland, California
WIC 204-5508-6200 94607

Gentlemen:

As requested by Mr. Jack Brastad of Shell Oil Company, we are forwarding a copy of the Site Update Report dated October 21, 1991. The enclosed report presents the results of the third quarter 1991 ground-water sampling at the above referenced location.

Please do not hesitate to call should you have any questions or comments.

Sincerely,

John P. Werfal
Project Manager

enclosure

cc: Mr. Jack Brastad, Shell Oil Company
Mr. Tom Callaghan, Regional Water Quality Control Board

GeoStrategies Inc.

# SITE UPDATE

Former Shell Service Station
461 Eighth Street
Oakland, California
WIC 204-5508-6200

764401-11

October 21, 1991

**GeoStrategies Inc.**
2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545
(510) 352-4800

October 21, 1991

Shell Oil Company
P.O. Box 5278
Concord, California 94520

Attn: Mr. Jack Brastad

Re: SITE UPDATE
Former Shell Service Station
461 Eighth Street
Oakland, California

Gentlemen:

This Site Update has been prepared by GeoStrategies Inc. (GSI) and presents the results of the 1991 third quarter ground-water sampling performed by Gettler-Ryan Inc. (G-R) for the above referenced site (Plate 1). The scope of work presented in this document was performed at the request of Shell Oil Company. Field work and laboratory analysis methods were performed to comply with current State of California Water Resources Control Board guidelines.

## SITE BACKGROUND

There are currently three monitoring wells in the site vicinity; Wells S-4 through S-6 (Plate 2). Seven ground-water monitoring wells (S-1 through S-7) were installed in 1981 by Groundwater Technology, Inc. (GTI). In 1982, GTI installed a ground-water recovery system in Well S-1. The recovery system was subsequently turned off in August 1982. Wells S-1 through S-3, and S-7 were destroyed in 1987. Wells S-4 through S-6 are off-site. These wells were installed to evaluate the vertical and horizontal extent of petroleum hydrocarbons in soils and shallow groundwater beneath and downgradient of the site.

Quarterly monitoring and sampling of wells began in 1988. Ground-water samples have been analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) according to EPA Method 8015 (Modified) and Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) according to EPA Method 8020.

## CURRENT QUARTERLY SAMPLING RESULTS

Potentiometric Data

Prior to ground-water sampling, depth to water-level measurements were obtained in each monitoring well using an electronic oil-water interface probe. Static ground-water levels were measured from the surveyed top of well box and recorded to the nearest 0.01 foot. Corresponding elevations, referenced to project site datum are presented in Table 1. Water-level data were used to construct the water level elevation map on Plate 3. **However, because insufficient water was present in Well S-4 to confirm a reliable water level, no gradient was calculated this quarter from the remaining two wells.**

Floating Product Measurements

Each well was checked for the presence of floating product using an electronic oil-water interface probe. A clear acrylic bailer was used to confirm probe results. **Floating product was observed** in Well S-5 at 0.06 **feet in measured** thickness.

Ground-water Analytical Data

Ground-water samples were collected on September 24, 1991. The samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020 by International Technology (IT), a State of California certified laboratory located in San Jose, California.

TPH-Gasoline and benzene were detected in Well S-6 at concentrations of 42. and 14. parts per million (ppm), respectively. **Well S-4 was not sampled due to insufficient water in the casing.** These data are summarized in Table 2 and included in Appendix A. A chemical concentration map for TPH-Gasoline and benzene is presented on Plate 4. Historical chemical analytical data are presented in Table 3.

S-5 had FP

Quality Control

The quality control (QC) sample for this quarter's sampling was a trip blank. This sample was prepared in the laboratory using organic-free water to evaluate laboratory handling procedures of samples. The results of QC sample analyses are presented in Table 2.

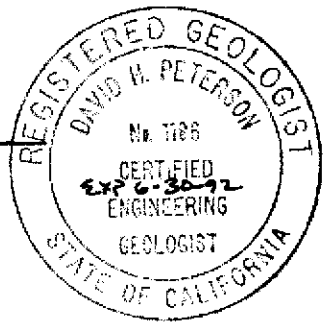
If you have any questions, please call.

GeoStrategies Inc. by,

Ellen C. Fostersmith

Ellen C. Fostersmith
Geologist

David H. Peterson




David H. Peterson
Senior Geologist
C.E.G. 1186

ECF/DHP/kjj

Plate 1. Vicinity Map
Plate 2. Site Plan
Plate 3. Water Level Elevation Map
Plate 4. TPH-Gasoline/Benzene Concentration Map

Appendix A: Analytical Laboratory Report and Chain-of-Custody

QC Review: JR

764401-11

TABLE 1

FIELD MONITORING DATA

| WELL NO. | MONITORING DATE | CASING DIA. (IN) | TOTAL WELL DEPTH (FT) | WELL ELEV. (FT) | DEPTH TO WATER (FT) | PRODUCT THICKNESS (FT) | STATIC WATER ELEV. (FT) | PURGED WELL VOLUMES | pH | TEMPERATURE (F) | CONDUCTIVITY (uMHOS/cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| S-4 | 24-Sep-91 | 4 | 16.3 | 93.51 | 15.85 | ---- | 77.66 | ---- | ---- | ---- | ---- |
| S-5 | 24-Sep-91 | 4 | ---- | 99.36 | 21.40 | 0.06 | 78.01 | ---- | ---- | ---- | ---- |
| S-6 | 24-Sep-91 | 4 | 38.3 | 100.58 | 22.26 | ---- | 78.32 | 5 | 6.52 | 68.4 | 684 |

Notes:
1. Static water elevations referenced to project datum.
2. Physical parameter measurements represent stabilized values.
3. Static water-levels corrected for floating product (conversion factor = 0.80).
4. Well S-4 not sampled due to insufficient water.

TABLE 2

GROUND-WATER ANALYSIS DATA

| WELL NO | SAMPLE DATE | ANALYSIS DATE | TPH-G (PPM) | BENZENE (PPM) | TOLUENE (PPM) | ETHYLBENZENE (PPM) | XYLENES (PPM) |
|---|---|---|---|---|---|---|---|
| S-6 | 24-Sep-91 | 01-Oct-91 | 42. | 14. | 4.3 | 1.2 | 4.0 |
| TB | ---- | 01-Oct-91 | <0.05 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |

CURRENT REGIONAL WATER QUALITY CONTROL BOARD MAXIMUM CONTAMINANT LEVELS
Benzene 0.001 ppm  Xylenes 1.750 ppm  Ethylbenzene 0.680 ppm

CURRENT DHS ACTION LEVELS
Toluene 0.1000 ppm

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline  TB = Trip Blank
PPM = Parts Per Million

Note: 1. All data shown as <x are reported as ND (none detected).
2. DHS Action Levels and MCLs are subject to change pending State review.

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

| SAMPLE DATE | SAMPLE POINT | TPH-G (PPM) | BENZENE (PPM) | TOLUENE (PPM) | ETHYLBENZENE (PPM) | XYLENES (PPM) |
|---|---|---|---|---|---|---|
| 16-Apr-87 | S-2 | 47. | 8.2 | 4.7 | ---- | 3.1 |
| 26-Oct-88 | S-4 | 0.13 | 0.0038 | 0.013 | 0.004 | 0.03 |
| 15-Feb-89 | S-4 | <0.05 | 0.0005 | <0.001 | <0.001 | 0.003 |
| 30-Apr-90 | S-4 | <0.050 | <0.0005 | <0.0005 | <0.0005 | <0.001 |
| 27-Jun-91 | S-4 | <0.05 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| 16-Apr-87 | S-5 | 130. | 15. | 16. | ---- | 14. |
| 26-Oct-88 | S-5 | 110. | 20. | 25. | 2.3 | 10. |
| 15-Feb-89 | S-5 | 94. | 16. | 21. | 1.8 | 10. |
| 02-May-89 | S-5 | 120. | 29. | 35. | 3.1 | 15. |
| 27-Jul-89 | S-5 | 110. | 20. | 29. | 2.4 | 14. |
| 30-Apr-90 | S-5 | 100. | 13. | 22. | 2.1 | 11. |
| 31-Jul-90 | S-5 | 53. | 8.3 | 14. | 1.2 | 7.4 |
| 16-Apr-87 | S-6 | 81. | 16. | 9. | ---- | 6.4 |
| 26-Oct-88 | S-6 | 110. | 29. | 18. | 2.5 | 8.2 |
| 15-Feb-89 | S-6 | 54. | 18. | 4.5 | 1.4 | 4. |
| 02-May-89 | S-6 | 93. | 43. | 9.9 | 3. | 8. |
| 27-Jul-89 | S-6 | 52. | 20. | 3.2 | 1.7 | 5.5 |
| 05-Oct-89 | S-6 | 55. | 20. | 2.9 | 1.6 | 5.5 |
| 09-Jan-90 | S-6 | 76. | 35. | 9.1 | 2.3 | 8.6 |
| 30-Apr-90 | S-6 | 39. | 13. | 2.3 | 0.9 | 2.8 |
| 31-Jul-90 | S-6 | 48. | 20. | 4.6 | 1.5 | 4.9 |
| 30-Oct-90 | S-6 | 27. | 7.4 | 0.9 | 0.6 | 1.4 |
| 06-Mar-91 | S-6 | 35. | 3.9 | 2.7 | 2.3 | 3.5 |
| 27-Jun-91 | S-6 | 51. | 19. | 5.6 | 1.7 | 6.3 |
| 24-Sep-91 | S-6 | 42. | 14. | 4.3 | 1.2 | 4.0 |

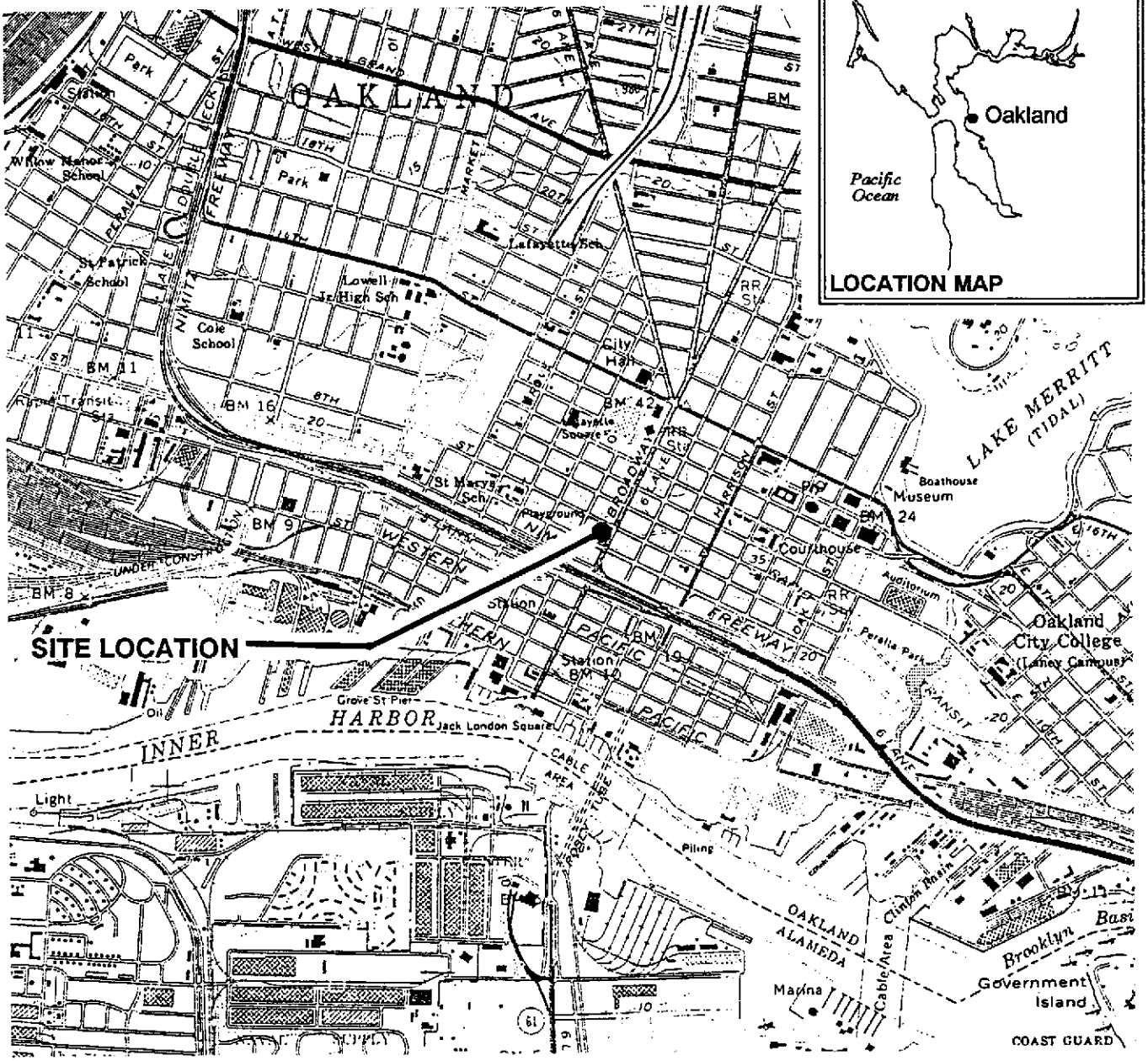
TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

Current Regional Water Quality Control Board Maximum Contaminant Levels
Benzene 0.001 ppm Xylenes 1.750 ppm Ethylbenzene 0.680 ppm

Current DHS Action Levels Toluene 0.1000 ppm

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPM = Parts Per Million
NOTE: 1. DHS Action levels and MCL's are subject to change pending State of California review.
2. Ethylbenzenes and Xylenes were combined prior to May 1987.
3. All data shown as <X are reported as ND (none detected).




Base Map: USGS Topographic Map

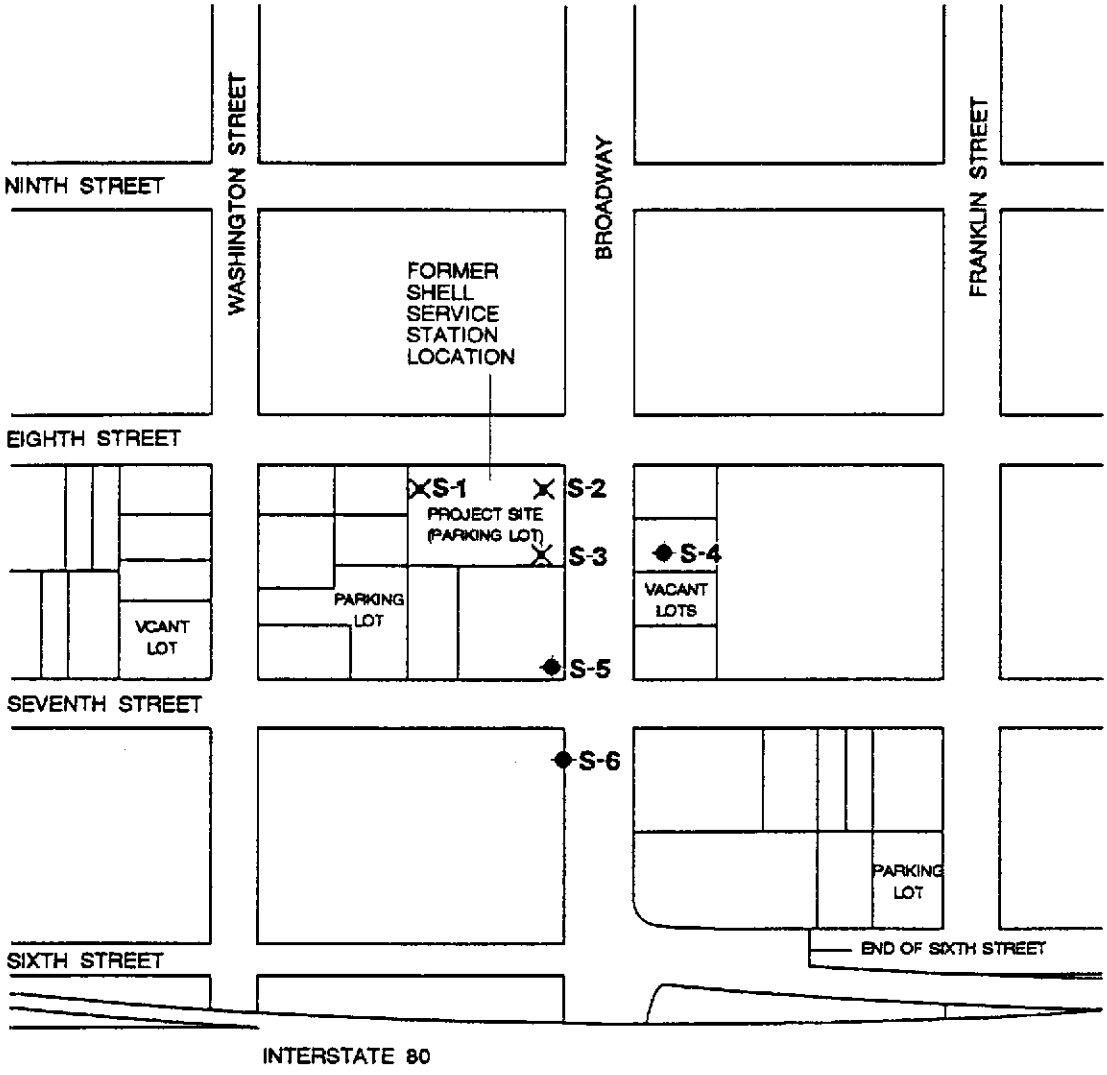
Approximate Scale : 1" = 2000'

GeoStrategies Inc.

**Vicinity Map**
Former Shell Service Station
461 Eighth Street
Oakland, California

PLATE
**1**

| JOB NUMBER | REVIEWED BY | DATE | REVISED DATE | REVISED DATE |
|---|---|---|---|---|
| 7644 | | 5/90 | | |




**EXPLANATION**

◆ S-1 Ground-water monitoring well location

✕ Destroyed well

N

0 200 400

Scale in Feet

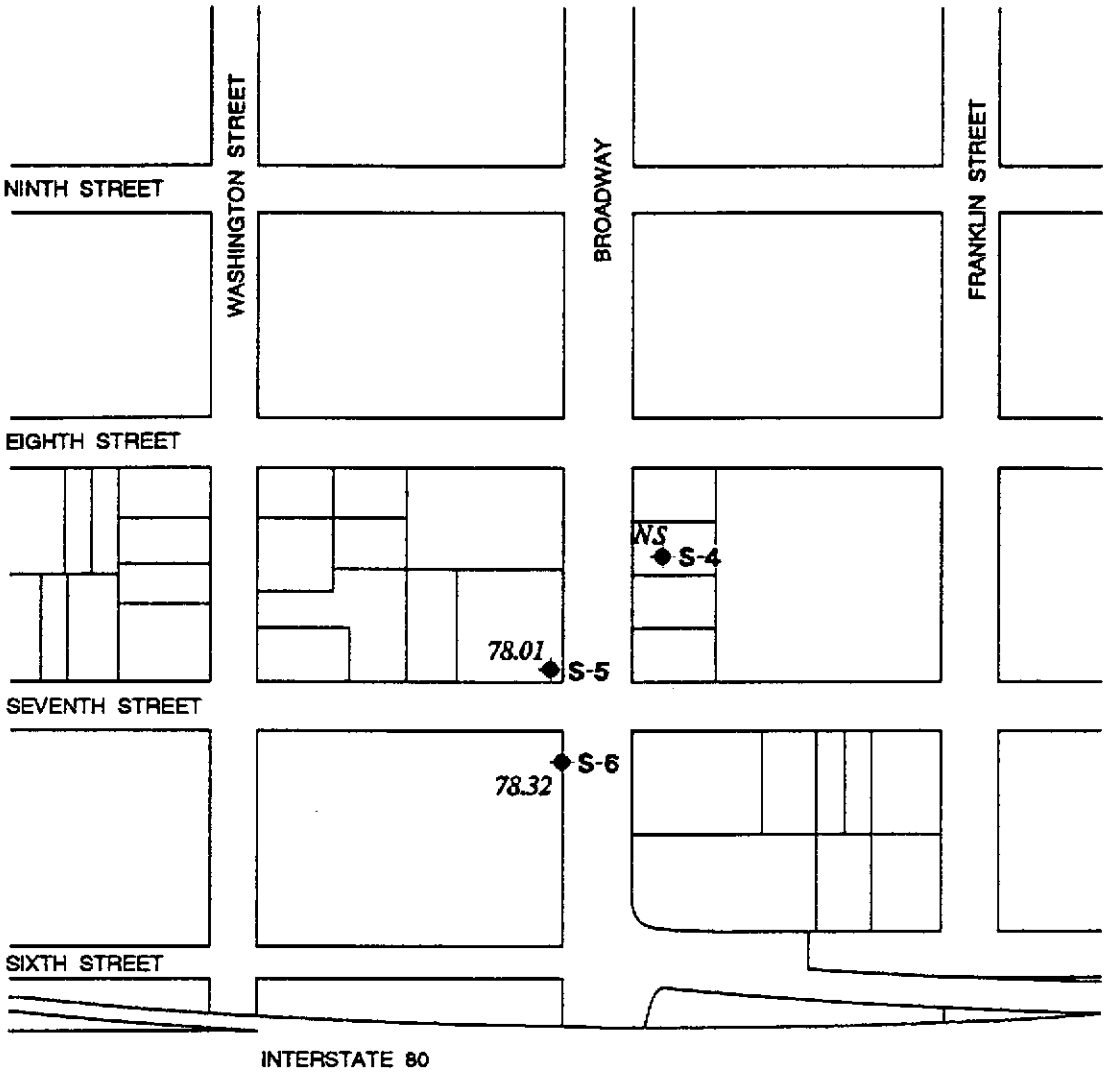
Note: Well S-7 located at Washington and Fifth Streets was destroyed in 1987

GeoStrategies Inc.

**Site Plan**
Former Shell Service Station
461 Eighth Street
Oakland, California

PLATE **2**

| JOB NUMBER | REVIEWED BY | DATE | REVISED DATE | REVISED DATE |
|---|---|---|---|---|
| 764401-11 | EKS | 10/91 | | |




## EXPLANATION

◆ S-1 Ground-water monitoring well location

*NS* Not sampled due to insufficient water

*78.32* Ground-water elevation in feet referenced to project datum measured on September 24, 1991

N

0 200 400

Scale in Feet

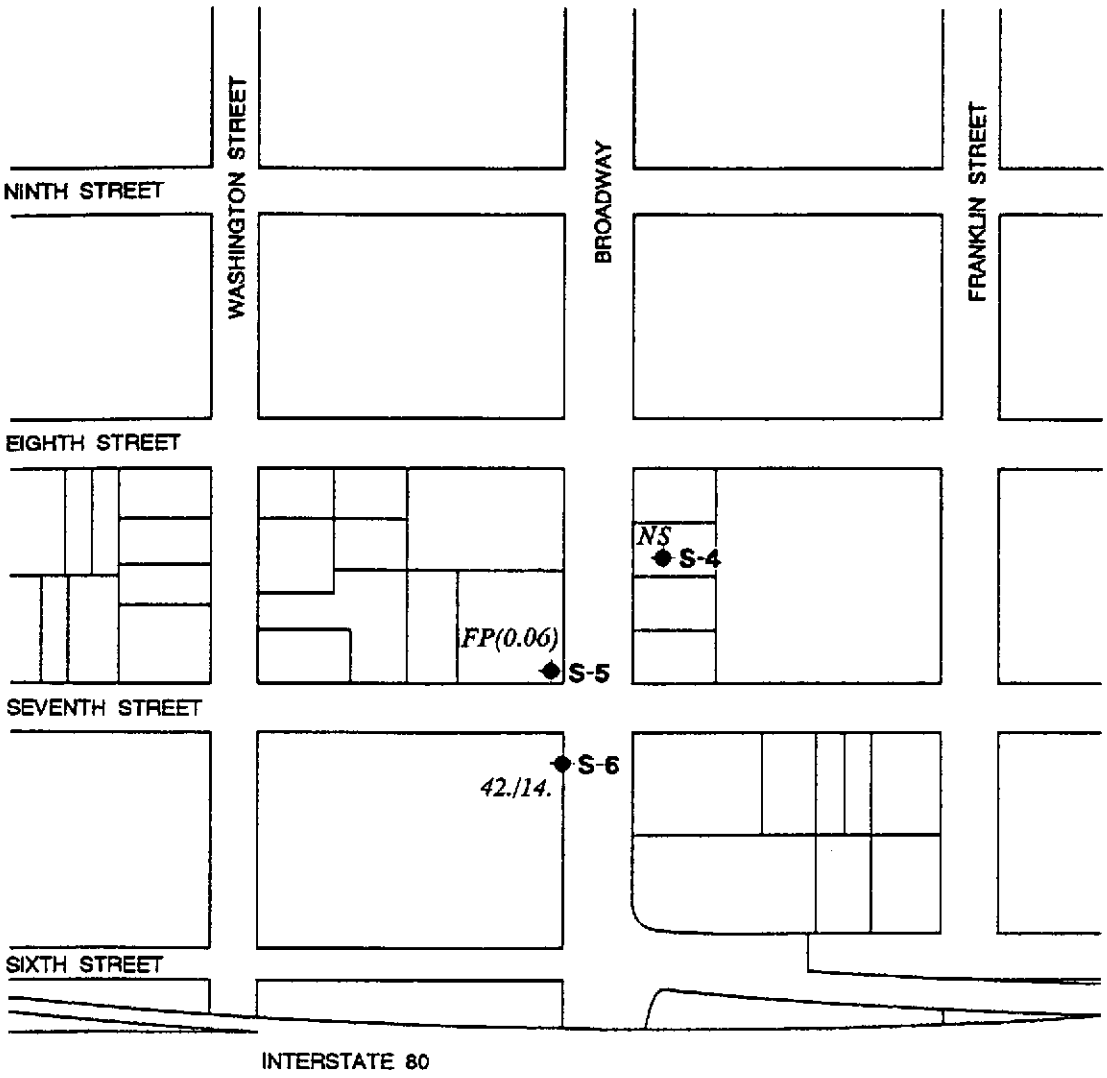
**Note:** Contours may be influenced by irrigation practices and/or site construction activities

GSI GeoStrategies Inc.

**Water-level Elevation Map**
Former Shell Service Station
461 Eighth Street
Oakland, California

PLATE **3**

| JOB NUMBER | REVIEWED BY | DATE | REVISED DATE | REVISED DATE |
|---|---|---|---|---|
| 764401-11 | EFS | 10/91 | | |




## EXPLANATION

| | |
|---|---|
| ◆ S-1 | Ground-water monitoring well location |
| *42./14.* | TPH-G (Total Petroleum Hydrocarbons calculated as Gasoline)/Benzene concentrations in ppm sampled on September 24, 1991 |
| *FP(0.06)* | Floating Product (measured thickness in feet) |
| *NS* | Not Sampled |

N

0 200 400

Scale in Feet

GeoStrategies Inc.

**TPH-G/Benzene Concentration Map**
Former Shell Service Station
461 Eighth Street
Oakland, California

PLATE **4**

| JOB NUMBER | REVIEWED BY | DATE | REVISED DATE | REVISED DATE |
|---|---|---|---|---|
| 764401-11 | GFS | 10/91 | | |

# APPENDIX A
# ANALYTICAL LABORATORY REPORT AND CHAIN-OF-CUSTODY FORMS

INTERNATIONAL TECHNOLOGY CORPORATION

# ANALYTICAL SERVICES

## CERTIFICATE OF ANALYSIS

Shell Oil Company
Gettler-Ryan
2150 West Winton
Hayward, CA 94545
Tom Paulson

Date: 10/09/91

Work Order: T1-09-323

P.O. Number: MOH 880-021 Vendor #I0002402

This is the Certificate of Analysis for the following samples:

Client Work ID: GR3644 461 8th St, Oakland
Date Received: 09/25/91
Number of Samples: 2
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS



Reviewed and Approved:

Hamid Allameh
Petroleum GC Team Leader

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/09/91
Client Work ID: GR3644 461 8th St, Oakland

Work Order: T1-09-323

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-6**
SAMPLE DATE: **09/24/91**
LAB SAMPLE ID: **T109323-01**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

**RESULTS in Milligrams per Liter:**

| | METHOD | EXTRACTION DATE | ANALYSIS DATE |
|---|---|---|---|
| BTEX | 8020 | | 10/01/91 |
| Low Boiling Hydrocarbons | Mod.8015 | | 10/01/91 |

| PARAMETER | DETECTION LIMIT | DETECTED |
|---|---|---|
| Low Boiling Hydrocarbons calculated as Gasoline | 10. | 42. |
| BTEX | | |
| Benzene | 0.1 | 14. |
| Toluene | 0.1 | 4.3 |
| Ethylbenzene | 0.1 | 1.2 |
| Xylenes (total) | 0.1 | 4.0 |

| SURROGATES | % REC |
|---|---|
| 1,3-Dichlorobenzene (Gasoline) | 102. |
| 1,3-Dichlorobenzene (BTEX) | 99. |

Company: Shell Oil Company
Date: 10/09/91
Client Work ID: GR3644 461 8th St, Oakland

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order: T1-09-323

TEST NAME: **Spike and Spike Duplicates**

SAMPLE ID: **S-6 MS/MSD**
SAMPLE DATE: **09/24/91**
LAB SAMPLE ID: **T109323-01D**
EXTRACTION DATE:
ANALYSIS DATE: **09/27/91**
ANALYSIS METHOD: **Mod.8015**

**QUALITY CONTROL REPORT**

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

**RESULTS in Micrograms per Liter**

| PARAMETER | Sample Amt | Spike Amt | MS Result | MSD Result | MS %Rec | MSD %Rec | RPD |
|---|---|---|---|---|---|---|---|
| Gasoline | 41.6 | 100000. | 126000. | 127000. | 126.* | 127.* | 1. |

| SURROGATES | MS %Rec | MSD %Rec |
|---|---|---|
| 1,3-Dichloroebenzene | 108. | 108. |

* Both recovery are due to the matrix effect. See non-conformance attached.

Company: Shell Oil Company
Date: 10/09/91
Client Work ID: GR3644 461 8th St, Oakland

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order: T1-09-323

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **TRIP BLANK**
SAMPLE DATE: **not spec**
LAB SAMPLE ID: **T109323-02**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

**RESULTS in Milligrams per Liter:**

| | METHOD | EXTRACTION DATE | ANALYSIS DATE |
|---|---|---|---|
| BTEX | 8020 | | 10/01/91 |
| Low Boiling Hydrocarbons | Mod.8015 | | 10/01/91 |

| PARAMETER | DETECTION LIMIT | DETECTED |
|---|---|---|
| Low Boiling Hydrocarbons calculated as Gasoline | 0.05 | None |
| BTEX | | |
| Benzene | 0.0005 | None |
| Toluene | 0.0005 | None |
| Ethylbenzene | 0.0005 | None |
| Xylenes (total) | 0.0005 | None |

| SURROGATES | % REC |
|---|---|
| 1,3-Dichlorobenzene (Gasoline) | 100. |
| 1,3-Dichlorobenzene (BTEX) | 97. |

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/09/91
Client Work ID: GR3644 461 8th St, Oakland

Work Order: T1-09-323

TEST NAME: Spike and Spike Duplicates

SAMPLE ID: Quality Control
SAMPLE DATE: not spec
LAB SAMPLE ID: T109323-03A
EXTRACTION DATE:
ANALYSIS DATE: 09/30/91
ANALYSIS METHOD: 8020

## QUALITY CONTROL REPORT

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Analyses

**RESULTS in Micrograms per Liter**

| PARAMETER | Sample Amt | Spike Amt | MS Result | MSD Result | MS %Rec | MSD %Rec | RPD |
|---|---|---|---|---|---|---|---|
| Benzene | ND<0.5 | 50. | 50.4 | 45.3 | 101. | 91. | 10. |
| Toluene | ND<0.5 | 50. | 50.1 | 45.1 | 100. | 90. | 10. |
| Ethylbenzene | ND<0.5 | 50. | 50.0 | 45.1 | 100. | 90. | 10. |
| Total Xylenes | ND<0.5 | 150. | 150. | 135. | 100. | 90. | 10. |

| SURROGATES | MS %Rec | MSD %Rec |
|---|---|---|
| 1,3-Dichloroebenzene | 99. | 104. |

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 10/09/91
Client Work ID: GR3644 461 8th St, Oakland

Work Order: T1-09-323

TEST CODE QC TEST NAME Quality Control

Quality control (QC) samples are analyzed and used to assess the laboratory control measures. Routine QC samples include method blanks, spikes and duplicates. The purpose of the method blank (MB) analysis is to demonstrate that artifacts of the test do not yield false positives. The laboratory control spike (LS) and /or matrix spike (MS) analysis is used to evaluate the ability of the test to recover analytes of interest, i.e. accuracy. Accuracy is expressed as percent (%) recovery. The laboratory spike duplicate (LSD), matrix spike duplicate (MSD), or duplicate sample (DUP) is used to determine the precision of the test, by comparing the result from the original spike (or sample) to the duplicate spike (or sample). Precision is expressed as relative percent difference (RPD).

The results of appropriate QC samples from QC batches associated with the listed samples are included in this report.

TEST CODE TPHVB TEST NAME TPH Gas,BTEX by 8015/8020

The method of analysis for low boiling hydrocarbons is taken from EPA Methods modified 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatography using a flame ionization detector in series with a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline. Results in soils are corrected for moisture content and are reported on a dry soil basis unless otherwise noted.

**Gettler - Ryan Inc.** ENVIRONMENTAL DIVISION 2753 **Chain of Custody**

COMPANY Shell JOB NO.

JOB LOCATION 7th Broadway

CITY Oakland PHONE NO. 415/783-7500

AUTHORIZED Tom Paulson DATE 9-24-91 P.O. NO. 3644-01

| SAMPLE ID | NO. OF CONTAINERS | SAMPLE MATRIX | DATE/TIME SAMPLED | ANALYSIS REQUIRED | SAMPLE CONDITION LAB ID |
|---|---|---|---|---|---|
| 01 BCS-6 | 3 | liquid | 9-24-91/0941 | THC/BTXE | cool 9-25-91 |
| 02 Trip Blank | 1 | " | " | " | |

RELINQUISHED BY: [signature] 9-24-91 1400

RECEIVED BY: Refrig #1 9-24-91 1400

RELINQUISHED BY: Refrig #1 9-25-91 09:00

RECEIVED BY: [signature] 9-25-91 09:00

RELINQUISHED BY: [signature] 9-25-91 11:00

RECEIVED BY LAB: M. LeGrande 9-25-91 1100

DESIGNATED LABORATORY: IT (SCV) DHS #: 137

REMARKS: Normal TAT

WIC #: 204-5608-6200

EXP: 5461

Engr: J. Brastad

DATE COMPLETED 9-24-91 FOREMAN [signature]

ORIGINAL