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

January 22, 1992

Ms. Susan Hugo
Alameda County
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Reference: Shell Service Station
1800 Powell Street
Emeryville, California
WIC 204-2495-0101

Ms. Hugo:

As requested by Mr. Paul Hayes of Shell Oil Company, we are forwarding a copy of the Site Update report, dated January 22, 1992, for the above referenced location. The report presents the results of the ground-water sampling conducted during the fourth quarter of 1991.

If you have any questions, please call.

Sincerely,

Ellen Fostersmith
Geologist

enclosure

cc: Mr. Thomas Callaghan, S.F. Regional Water Quality Control Board
Mr. Paul Hayes, Shell Oil Company

GeoStrategies Inc.

# SITE UPDATE

Shell Service Station
1800 Powell Street
Emeryville, California
WIC 204-2495-0101

760501-13

January 22, 1992

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

January 22, 1992

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

Attn: Mr. E. Paul Hayes

Re: SITE UPDATE
Shell Service Station
1800 Powell Street
Emeryville, California

Gentlemen:

This Site Update has been prepared by GeoStrategies Inc. (GSI) and presents the results of the 1991 fourth 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 seven monitoring wells at the site; Wells S-5, S-8, S-9, S-10, S-12, S-13 and S-14 (Plate 2). Wells S-1 through S-5 were installed prior to 1982. GSI installed Wells S-12 through S-14 in 1989. Wells S-1 through S-4 and S-11 were redesignated as tank backfill wells S-A through S-E, respectively. Wells S-6 and S-7 were abandoned in 1989. Wells S-8 through S-10 and S-12 through S-14 are onsite and Well S-5 is offsite. These wells were installed to evaluate the vertical and horizontal extent of petroleum hydrocarbons in soils and shallow groundwater beneath 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 the well box and recorded to the nearest $\pm 0.01$ foot. Corresponding elevations, referenced to Mean Sea Level (MSL) datum and the stabilized values of measured physical parameters are presented in Table 1. Water-level data were used to construct a quarterly potentiometric map (Plate 3). Shallow ground-water flow is to the south and southwest at a calculated hydraulic gradient of 0.01.

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 not observed in the well this quarter. Well S-9 contained a black sludge substance, and was not monitored or sampled.

The sludge has been observed in Well S-9 since June 1986. Due to its high viscosity, an accurate thickness cannot be measured in Well S-9 at this time.

Ground-water Analytical Data

Ground-water samples were collected on October 11, 1991. The samples were analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline), according to EPA Method 8015 (Modified) and for BTEX according to EPA Method 8020. Samples from Wells S-12, S-13 and S-14 were analyzed for Total Petroleum Hydrocarbons as Oil (TPH-Oil) and as Diesel (TPH-Diesel) according to EPA Method 8015 (Modified). The ground-water samples were analyzed by National Environmental Testing (NET) Inc., a California State-certified laboratory located in San Rosa, California.

TPH-Gasoline was detected in Wells S-5, S-8, S-12, S-13 and S-14, at concentrations ranging from 0.22 to 4.9 parts per million (ppm). Benzene concentrations in these wells ranged from 0.0021 ppm to 0.83 ppm. TPH-Diesel was detected in Wells S-12, S-13 and S-14 at concentrations of 2.5 ppm, 2.4 ppm and 21. ppm, respectively. TPH-Oil was detected in Wells S-12 and S-13 at concentrations of 5.1 and 4.9, respectively. These data are summarized in Table 2 and presented in Appendix A. Chemical isoconcentration maps for TPH-Gasoline and benzene are presented on Plates 4 and 5. Historical chemical analytical data are presented in Table 3.

Quality Control

The Quality Control (QC) samples for this quarter's ground-water sampling included a duplicate sample and a trip blank. The duplicate sample was collected as a split (second) sample to assess laboratory analytical precision. The trip blank was prepared in the laboratory using organic-free water to evaluate laboratory handling procedures. The results of QC sample analyses are presented in Table 2.

If you have any questions, please call.

GeoStrategies Inc. by,

Bob Lauterbach for

Stephen J. Carter
Project Manager

Michael Carey

Michael Carey
Engineering Geologist
C.E.G. 1351

REGISTERED ENGINEERING GEOLOGIST
MICHAEL C. CAREY
C.E.G. 1351
Exp: 6-30-92
STATE OF CALIFORNIA

SJC/MCC/dls

Plate 1. Vicinity Map
Plate 2. Site Plan
Plate 3. Potentiometric Map
Plate 4. TPH-G Isoconcentration Map
Plate 5. Benzene Isoconcentration Map

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

QC Review: RAC

760501-13

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-5 | 11-Oct-91 | 10 | 12.1 | 11.72 | 9.67 | ---- | 2.05 | 3 | 6.85 | 74.0 | 2270 |
| S-8 | 11-Oct-91 | 3 | 19.3 | 12.76 | 10.83 | ---- | 1.93 | 5 | 6.72 | 74.0 | 7220 |
| S-9 | 11-Oct-91 | 3 | ---- | 12.75 | 22.3 | ---- | ---- | ---- | ---- | ---- | ---- |
| S-10 | 11-Oct-91 | 6 | 19.5 | 12.58 | 7.77 | ---- | 4.81 | 2 | 7.03 | 73.8 | 613 |
| S-12 | 11-Oct-91 | 3 | 24.4 | 12.84 | 9.90 | ---- | 2.94 | 5 | 6.29 | 70.6 | 7090 |
| S-13 | 11-Oct-91 | 3 | 20.0 | 12.59 | 10.78 | ---- | 1.81 | 3 | 7.01 | 73.0 | 8370 |
| S-14 | 11-Oct-91 | 3 | 24.0 | 12.69 | 10.77 | ---- | 1.92 | 5 | 7.05 | 70.0 | 5070 |

Notes:
1. Static water elevations referenced to Mean Sea Level (MSL).
2. Physical parameter measurements represent stabilized values.
3. Well S-9 contained a black, tarry substance and was not monitored and or sampled.
4. Well S-10 was not sampled due to insufficient recharge after two hours.

TABLE 2

GROUND-WATER ANALYSIS DATA

| WELL NO | SAMPLE DATE | ANALYSIS DATE | TPH-G (PPM) | BENZENE (PPM) | TOLUENE (PPM) | ETHYLBENZENE (PPM) | XYLENES (PPM) | TPH-D (PPM) | TPH-O (PPM) |
|---|---|---|---|---|---|---|---|---|---|
| S-5 | 11-Oct-91 | 19-Oct-91 | 1.7 | 0.016 | 0.0057 | 0.0052 | 0.0089 | ---- | ---- |
| S-8 | 11-Oct-91 | 20-Oct-91 | 0.34 | 0.0040 | 0.0006 | <0.0005 | 0.017 | ---- | ---- |
| S-12 | 11-Oct-91 | 20-Oct-91 | 0.22 | 0.0021 | 0.0007 | <0.0005 | 0.0012 | 2.5 | 5.1 |
| S-13 | 11-Oct-91 | 20-Oct-91 | 0.48 | 0.83 | 0.015 | <0.0005 | 0.12 | 2.4 | 4.9 |
| S-14 | 11-Oct-91 | 21-Oct-91 | 4.9 | 0.007 | 0.0012 | <0.0005 | 0.025 | 21. | <0.5 |
| SD-5 | 11-Oct-91 | 20-Oct-91 | 1.1 | 0.018 | 0.0057 | 0.0052 | 0.0089 | ---- | ---- |
| TB | ---- | 20-Oct-91 | <0.05 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.05 | <0.5 |

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
TPH-D = Total Petroleum Hydrocarbons calculated as Diesel
TPH-O = Total Petroleum Hydrocarbons calculated as Oil

PPM = Parts Per Million
SD = Duplicate Sample
TB = Trip Blank

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.

760501-13

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

| SAMPLE DATE | SAMPLE WELL | TPH-G (PPM) | BENZENE (PPM) | TOLUENE (PPM) | ETHYLBENZENE (PPM) | XYLENES (PPM) | TPH-D (PPM) | OIL (PPM) |
|---|---|---|---|---|---|---|---|---|
| 27-Oct-88 | S-5 | 3. | 0.66 | 0.02 | 0.02 | 0.07 | N/A | N/A |
| 10-Feb-89 | S-5 | 2.9 | 0.55 | 0.02 | 0.02 | 0.03 | N/A | N/A |
| 28-Apr-89 | S-5 | 4.3 | 0.75 | 0.01 | 0.02 | <0.03 | N/A | N/A |
| 07-Jul-89 | S-5 | 1.5 | 0.30 | 0.008 | 0.007 | 0.009 | N/A | N/A |
| 25-Oct-89 | S-5 | 2.1 | 0.76 | 0.01 | 0.04 | 0.05 | N/A | N/A |
| 04-Jan-90 | S-5 | 1.3 | 0.52 | 0.009 | 0.008 | 0.01 | N/A | N/A |
| 06-Jul-90 | S-5 | 1.4 | 0.5 | 0.01 | 0.004 | <0.01 | N/A | N/A |
| 19-Oct-90 | S-5 | 4.2 | 1.1 | 0.009 | 0.014 | 0.007 | N/A | N/A |
| 14-Jan-91 | S-5 | 4.5 | 1.1 | 0.015 | 0.030 | 0.025 | 6.1 | N/A |
| 23-Apr-91 | S-5 | 2.8 | 0.50 | 0.008 | 0.014 | 0.010 | N/A | N/A |
| 08-Jul-91 | S-5 | 3.2 | 1.0 | 0.016 | 0.009 | 0.012 | N/A | N/A |
| 11-Oct-91 | S-5 | 1.7 | 0.016 | 0.0057 | 0.0052 | 0.0089 | N/A | N/A |
| 27-Oct-88 | S-6 | 6. | 1.7 | 0.05 | 0.08 | 0.42 | N/A | N/A |
| 10-Feb-89 | S-6 | 2.8 | 0.74 | 0.02 | 0.02 | 0.14 | N/A | N/A |
| 28-Apr-89 | S-6 | 6.5 | 2.4 | 0.03 | 0.05 | 0.21 | N/A | N/A |
| 07-Jul-89 | S-6 | 3.7 | 1.7 | 0.034 | 0.055 | 0.20 | N/A | N/A |
| 25-Oct-89 | S-6 | <0.05 | 0.023 | <0.005 | <0.005 | 0.01 | N/A | N/A |
| 10-Nov-89 | S-6 | Well abandoned | | | | | | |
| 27-Oct-88 | S-7 | 0.05 | 0.0011 | <0.001 | <0.001 | 0.004 | N/A | N/A |
| 10-Feb-89 | S-7 | 0.05 | 0.0009 | <0.001 | <0.001 | <0.003 | N/A | N/A |
| 28-Apr-89 | S-7 | <0.05 | 0.001 | <0.001 | <0.001 | <0.003 | N/A | N/A |
| 07-Jul-89 | S-7 | 0.07 | 0.0022 | <0.001 | <0.001 | <0.003 | N/A | N/A |
| 25-Oct-89 | S-7 | 6.2 | 2.2 | 0.13 | 0.19 | 0.66 | N/A | N/A |
| 10-Nov-89 | S-7 | Well abandoned | | | | | | |
| 27-Oct-88 | S-8 | 1. | 0.61 | 0.009 | 0.001 | 0.042 | N/A | N/A |
| 10-Feb-89 | S-8 | 0.5 | 0.16 | 0.005 | <0.002 | 0.017 | N/A | N/A |
| 28-Apr-89 | S-8 | 2.7 | 1.5 | 0.02 | 0.01 | 0.04 | N/A | N/A |

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

| SAMPLE DATE | SAMPLE WELL | TPH-G (PPM) | BENZENE (PPM) | TOLUENE (PPM) | ETHYLBENZENE (PPM) | XYLENES (PPM) | TPH-D (PPM) | OIL (PPM) |
|---|---|---|---|---|---|---|---|---|
| 07-Jul-89 | S-8 | 0.44 | 0.18 | 0.005 | 0.002 | 0.012 | N/A | N/A |
| 25-Oct-89 | S-8 | 2. | 1.1 | 0.017 | 0.005 | 0.07 | N/A | N/A |
| 04-Jan-90 | S-8 | 1.9 | 1.3 | 0.02 | <0.01 | 0.07 | N/A | N/A |
| 06-Jul-90 | S-8 | 1.6 | 0.92 | 0.03 | <0.01 | 0.06 | N/A | N/A |
| 19-Oct-90 | S-8 | 1.4 | 0.64 | <0.01 | <0.01 | 0.03 | N/A | N/A |
| 14-Jan-91 | S-8 | 0.67 | 0.19 | 0.0058 | <0.0005 | 0.019 | 0.76 | 0.6 |
| 23-Apr-91 | S-8 | 2.4* | 0.74 | 0.054 | 0.0057 | 0.059 | N/A | N/A |
| 08-Jul-91 | S-8 | 1.1 | 0.45 | 0.015 | <0.0025 | 0.042 | N/A | N/A |
| 11-Oct-91 | S-8 | 0.34 | 0.0040 | 0.0006 | <0.0005 | 0.017 | N/A | N/A |
| 27-Oct-88 | S-9 | Floating Product (thickness not measured) | | | | | | |
| 10-Feb-89 | S-9 | Floating Product (1.30 feet measured thickness) | | | | | | |
| 28-Apr-89 | S-9 | Floating Product (1.25 feet measured thickness) | | | | | | |
| 07-Jul-89 | S-9 | Floating Product (1.20 feet measured thickness) | | | | | | |
| 25-Oct-89 | S-9 | Floating Product (unable to measure accurately) | | | | | | |
| 04-Jan-90 | S-9 | Floating Product (unable to measure accurately) | | | | | | |
| 12-Apr-90 | S-9 | Floating Product (unable to measure accurately) | | | | | | |
| 06-Jul-90 | S-9 | Floating Product (unable to measure accurately) | | | | | | |
| 19-Oct-90 | S-9 | Floating Product (unable to measure accurately) | | | | | | |
| 14-Jan-91 | S-9 | Floating Product (unable to measure accurately) | | | | | | |
| 23-Apr-91 | S-9 | Floating Product (unable to measure accurately) | | | | | | |
| 08-Jul-91 | S-9 | Floating Product (unable to measure accurately) | | | | | | |
| 27-Oct-88 | S-10 | 700. | 37. | 100. | 20. | 110. | N/A | N/A |
| 10-Feb-89 | S-10 | 6.5 | 0.48 | 0.7 | 0.1 | 1.8 | N/A | N/A |
| 28-Apr-89 | S-10 | 13. | 1.3 | 0.5 | 0.6 | 3.7 | N/A | N/A |
| 07-Jul-89 | S-10 | 14. | 1.3 | 0.31 | 0.27 | 2.4 | N/A | N/A |
| 25-Oct-89 | S-10 | 4.2 | 0.58 | 0.034 | 0.044 | 0.44 | N/A | N/A |
| 04-Jan-90 | S-10 | 1.7 | 0.36 | 0.010 | 0.0078 | 0.17 | N/A | N/A |
| 12-Apr-90 | S-10 | Floating Product (0.01 feet measured thickness) | | | | | | |
| 06-Jul-90 | S-10 | Floating Product (0.01 feet measured thickness) | | | | | | |

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

| SAMPLE DATE | SAMPLE WELL | TPH-G (PPM) | BENZENE (PPM) | TOLUENE (PPM) | ETHYLBENZENE (PPM) | XYLENES (PPM) | TPH-D (PPM) | OIL (PPM) |
|---|---|---|---|---|---|---|---|---|
| 19-Oct-90 | S-10 | Floating Product (0.03 feet measured thickness) | | | | | | |
| 14-Jan-91 | S-10 | Floating Product (0.03 feet measured thickness) | | | | | | |
| 23-Apr-91 | S-10 | Floating Product (0.01 feet measured thickness) | | | | | | |
| 08-Jul-91 | S-10 | Floating Product (0.03 feet measured thickness) | | | | | | |
| 17-Nov-89 | S-12 | <0.25 | 0.018 | <0.002 | <0.002 | <0.005 | 1.4 | N/A |
| 04-Jan-90 | S-12 | <0.25 | 0.024 | 0.002 | <0.002 | <0.005 | N/A | N/A |
| 06-Jul-90 | S-12 | 0.08 | 0.015 | 0.0007 | <0.0005 | 0.002 | N/A | N/A |
| 19-Oct-90 | S-12 | 0.15 | 0.012 | 0.009 | <0.0005 | 0.0036 | N/A | N/A |
| 14-Jan-90 | S-12 | 0.12 | 0.0036 | 0.0008 | <0.0005 | 0.0029 | 1.0 | 0.6 |
| 23-Apr-91 | S-12 | 0.10 | 0.0037 | 0.0038 | 0.0008 | 0.011 | 0.82^ | 0.80 |
| 08-Jul-91 | S-12 | 0.07 | 0.0025 | 0.0008 | <0.0005 | 0.0024 | N/A | N/A |
| 11-Oct-91 | S-12 | 0.22 | 0.0021 | 0.0007 | <0.0005 | 0.0012 | 2.5 | 5.1 |
| 17-Nov-89 | S-13 | 1.9 | 0.70 | 0.16 | 0.07 | 0.34 | 2.0 | 5. |
| 04-Jan-90 | S-13 | 2.8 | 1.4 | 0.13 | 0.010 | 0.50 | N/A | N/A |
| 06-Jul-90 | S-13 | 3.1 | 1.8 | 0.06 | 0.04 | 0.27 | N/A | N/A |
| 24-Oct-90 | S-13 | 3.4 | 1.5 | 0.028 | 0.028 | 0.25 | N/A | N/A |
| 14-Jan-90 | S-13 | 1.9 | 0.83 | 0.015 | <0.01 | 0.099 | 0.9 | 1.6 |
| 23-Apr-91 | S-13 | 2.9* | 1.1 | 0.02 | 0.03 | 0.14 | 0.77& | 0.64 |
| 08-Jul-91 | S-13 | 1.5 | 0.88 | 0.010 | 0.006 | 0.16 | N/A | N/A |
| 11-Oct-91 | S-13 | 0.48 | 0.83 | 0.015 | <0.0005 | 0.12 | 2.4 | 4.9 |
| 17-Nov-89 | S-14 | <0.25 | 0.003 | <0.002 | <0.002 | <0.005 | <0.4 | 3. |
| 04-Jan-90 | S-14 | <0.25 | 0.003 | 0.002 | <0.002 | <0.005 | N/A | N/A |
| 23-Apr-91 | S-14 | 1.2 | 0.0074 | 0.0027 | 0.015 | 0.11 | 18.& | <5.0 |
| 08-Jul-91 | S-14 | 0.19 | 0.0065 | 0.0006 | 0.0019 | 0.026 | N/A | N/A |
| 11-Oct-91 | S-14 | 4.9 | 0.007 | 0.0012 | <0.0005 | 0.025 | 21 | <0.5 |

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

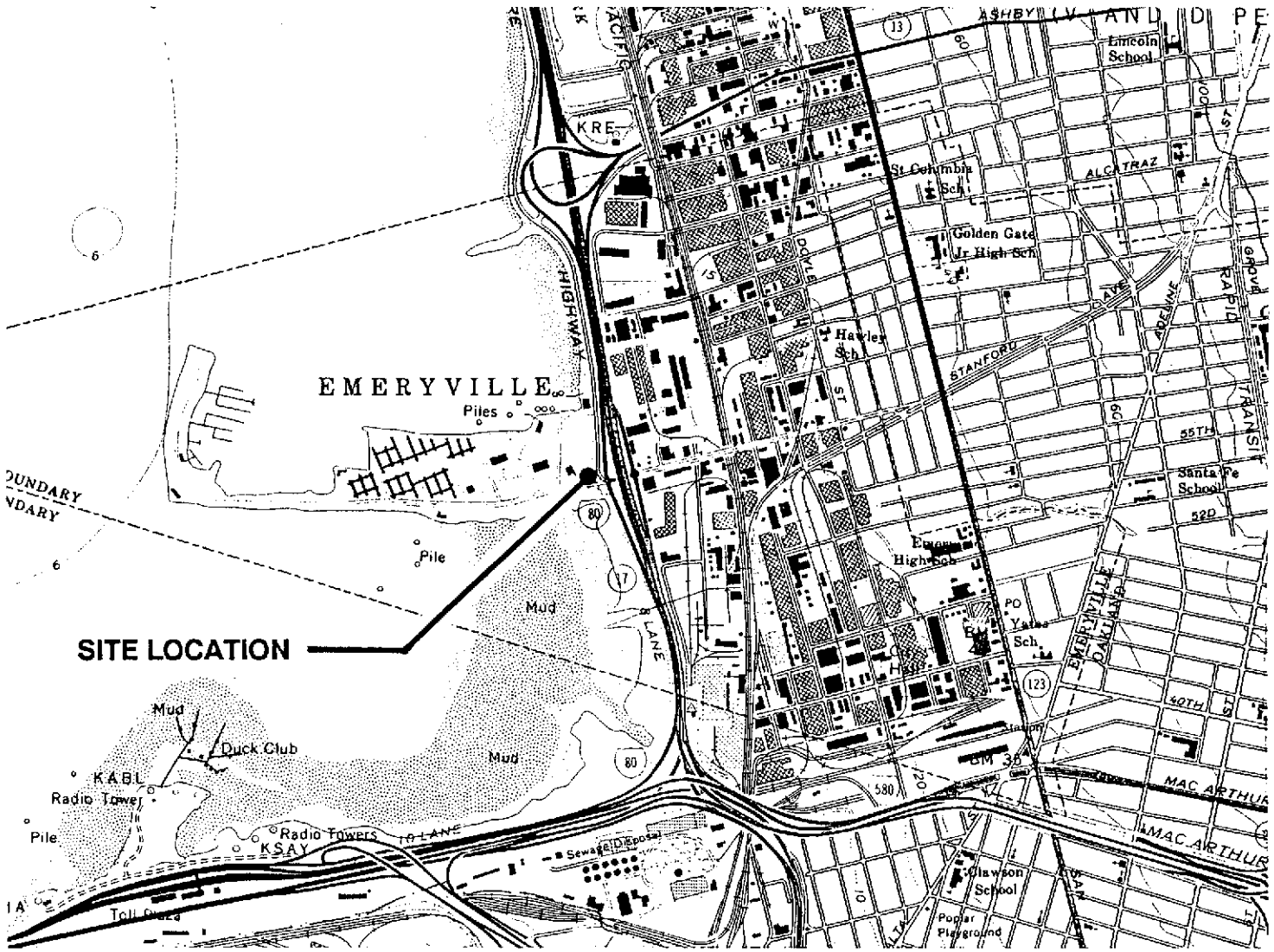
| SAMPLE DATE | SAMPLE WELL | TPH-G (PPM) | BENZENE (PPM) | TOLUENE (PPM) | ETHYLBENZENE (PPM) | XYLENES (PPM) | TPH-D (PPM) | OIL (PPM) |
|---|---|---|---|---|---|---|---|---|

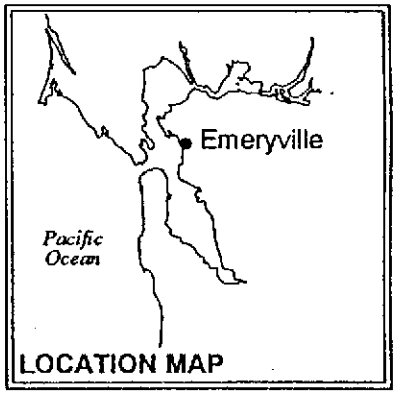
Current Regional Water Quality Control Board Maximum Contaminant Levels
Benzene 0.001 ppm Xylenes 1.750 ppm Ethylbenzene 0.680 ppm

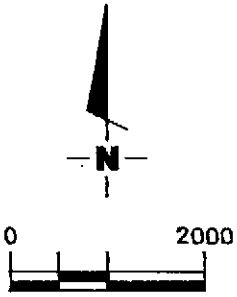
Current DHS Action Levels Toluene 0.1000 ppm

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
TPH-D = Total Petroleum Hydrocarbons calculated as Diesel
PPM = Parts Per Million
* Compounds detected and calculated as low boiling hydrocarbons consist of compounds eluting within the chromatographic range of gasoline, but are not characteristic of the standard gasoline pattern.
^ Chromatographic pattern of compounds detected and calculated as diesel is similar to but does not match that of the diesel standard used for calibration; pattern is characteristic of weathered diesel.
& Results include compounds apparently due to gasoline as well as those due to diesel.

NOTE: 1. DHS Action levels and MCL's are subject to change pending State of California review.
2. All data shown as <X are reported as ND (none detected).




Base Map: USGS Topographic Map

GeoStrategies Inc.

VICINITY MAP
Shell Service Station
1800 Powell Street
Emeryville, California

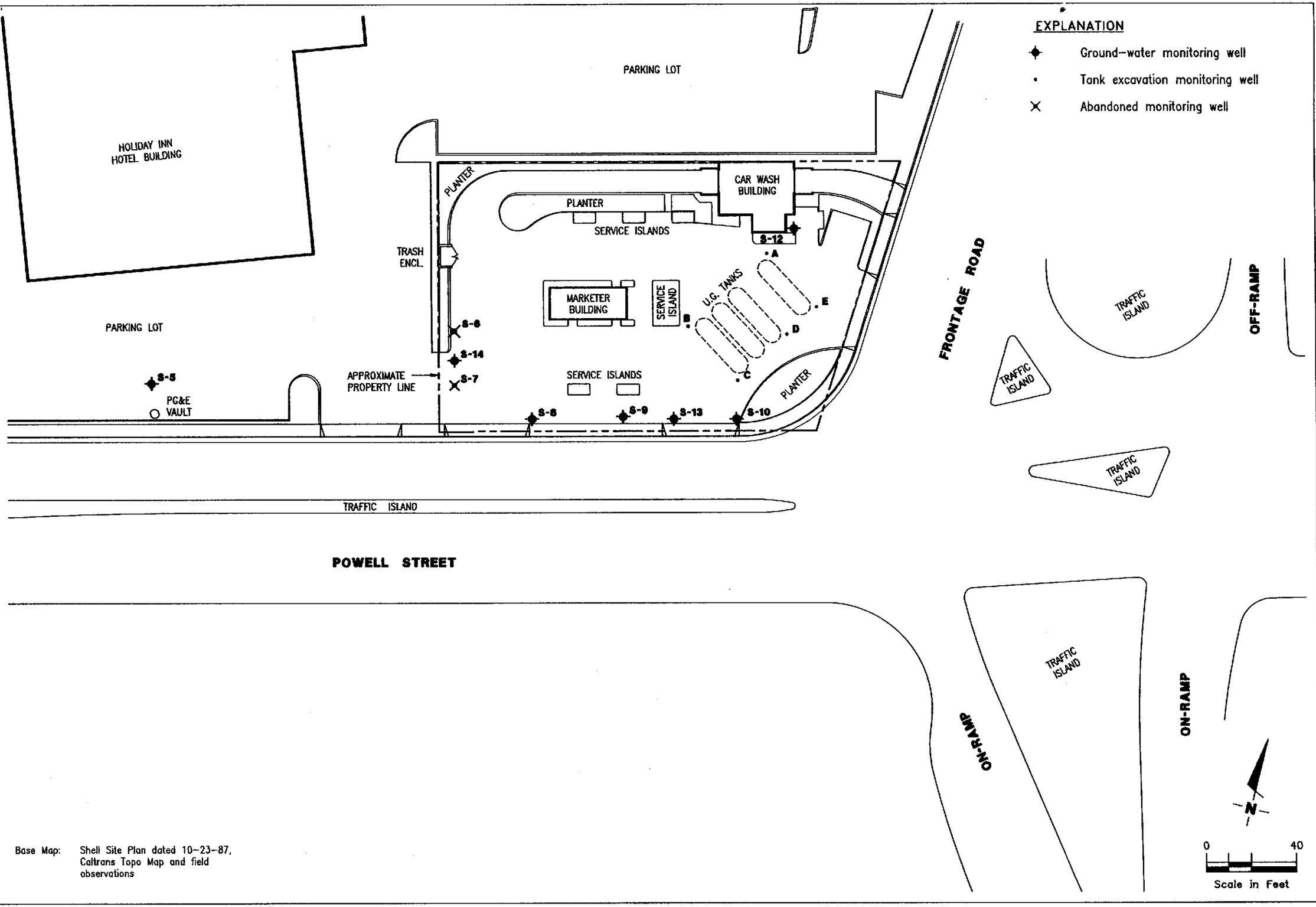
PLATE
1

JOB NUMBER
7605

REVIEWED BY

DATE

REVISED DATE




Base Map: Shell Site Plan dated 10-23-87, Caltrans Topo Map and field observations

PLATE 2

**SITE PLAN**
**Shell Service Station**
1800 Powell Street
Emeryville, California

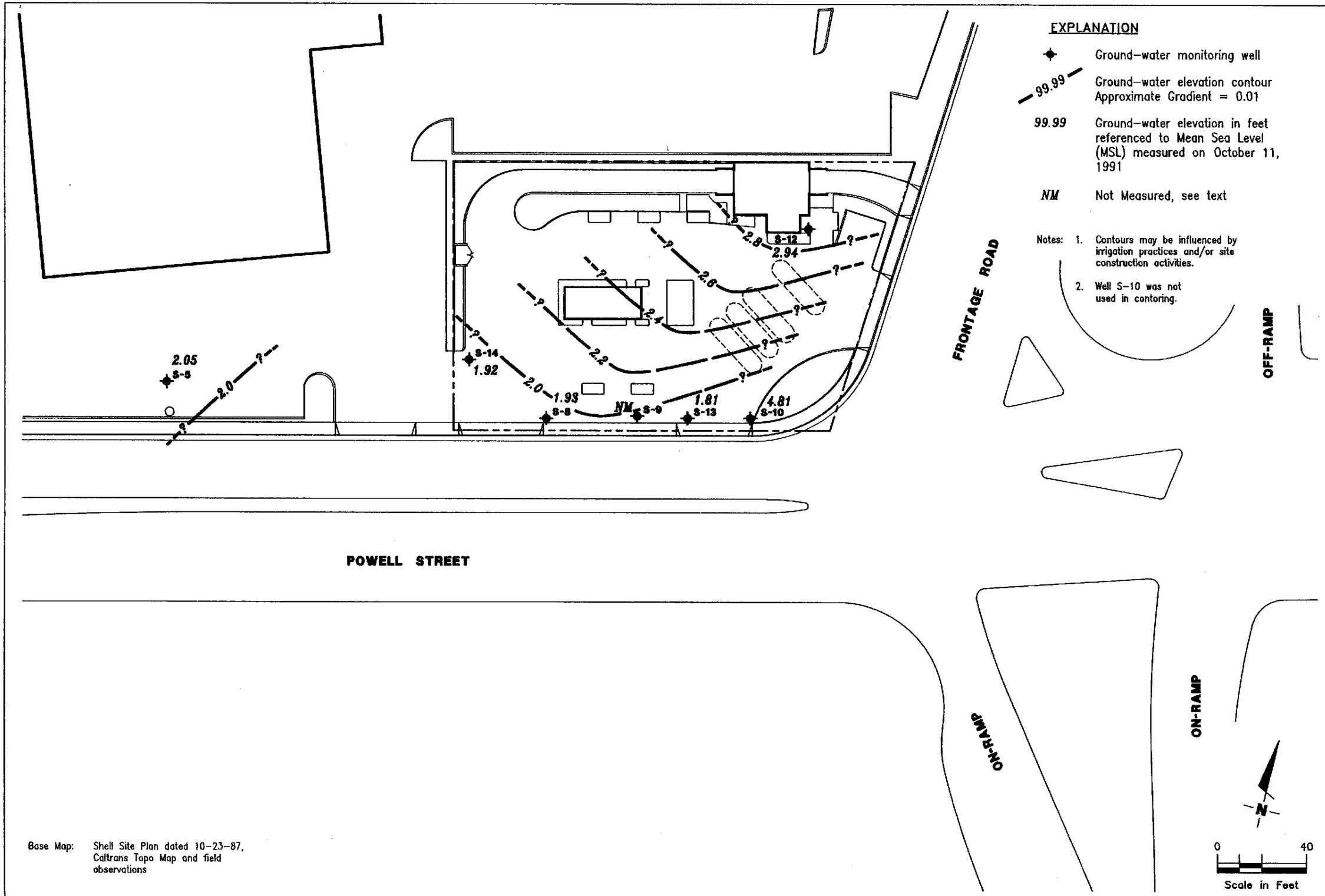
GeoStrategies Inc.

REVISED DATE

DATE 1/92

REVIEWED BY

JOB NUMBER 760501-13




## EXPLANATION

- Ground-water monitoring well
- 99.99 — Ground-water elevation contour Approximate Gradient = 0.01
- *99.99* — Ground-water elevation in feet referenced to Mean Sea Level (MSL) measured on October 11, 1991
- *NM* — Not Measured, see text

Notes:
1. Contours may be influenced by irrigation practices and/or site construction activities.
2. Well S-10 was not used in contoring.

Base Map: Shell Site Plan dated 10-23-87, Caltrans Topo Map and field observations

PLATE 3

**POTENTIOMETRIC MAP**
**Shell Service Station**
1800 Powell Street
Emeryville, California

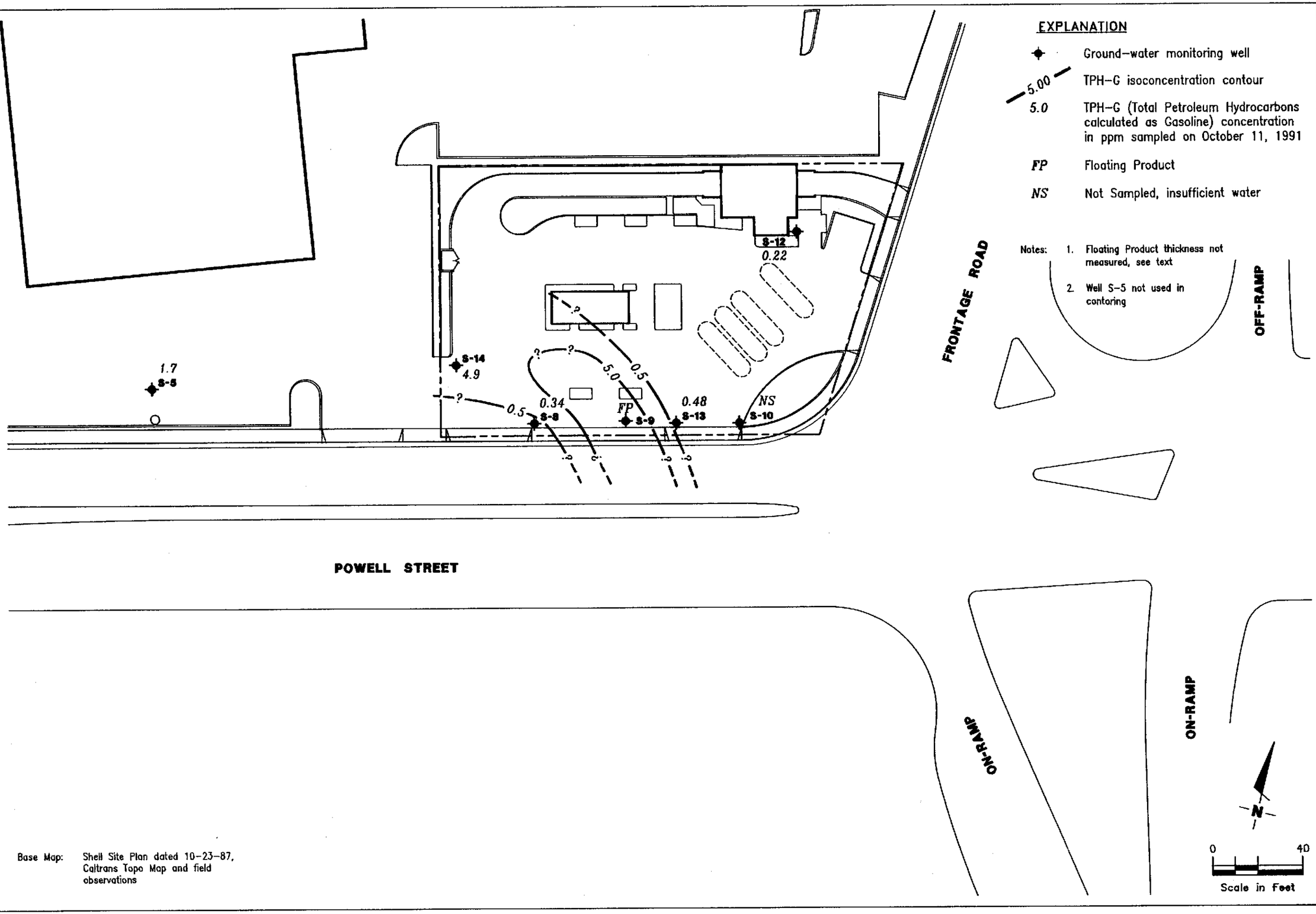
GeoStrategies Inc.

REVISED DATE

DATE 1/92

REVIEWED BY EMS

JOB NUMBER 760501-13




Base Map: Shell Site Plan dated 10–23–87, Caltrans Topo Map and field observations

PLATE 4

**TPH–G ISOCONCENTRATION MAP**
**Shell Service Station**
1800 Powell Street
Emeryville, California

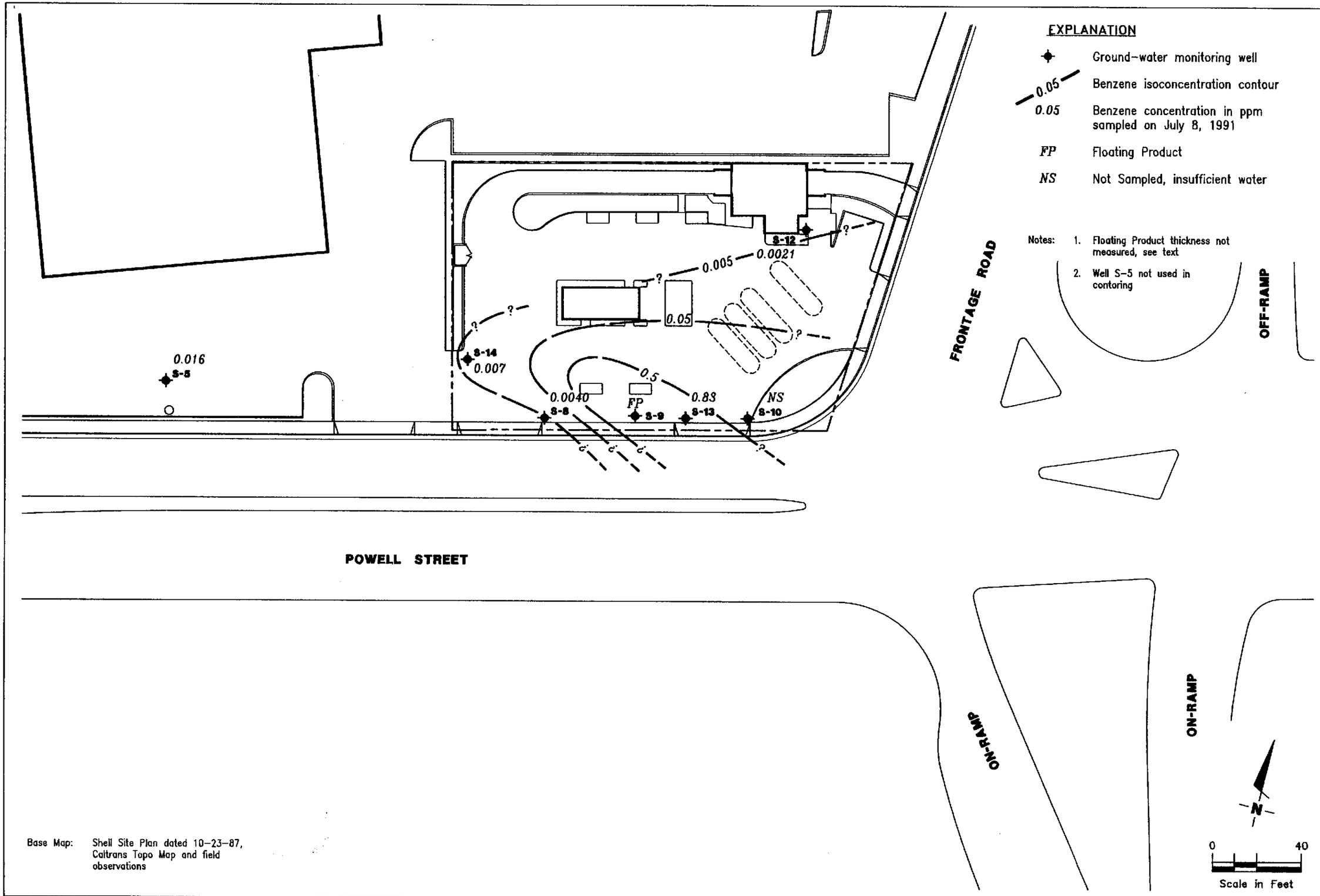
GeoStrategies Inc.

REVISED DATE

DATE 1/92

REVIEWED BY

JOB NUMBER 760501–13




Base Map: Shell Site Plan dated 10-23-87, Caltrans Topo Map and field observations

PLATE 5

**BENZENE ISOCONCENTRATION MAP**
**Shell Service Station**
1800 Powell Street
Emeryville, California

GeoStrategies Inc.

| JOB NUMBER | REVIEWED BY | DATE | REVISED DATE |
|---|---|---|---|
| 760501-13 | EJ | 1/92 | |

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

NET
NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623



Tom Paulson
Gettler-Ryan, Inc.
2150 W. Winton Avenue
Hayward, CA 94545

Date: 10/22/1991
NET Client Acct. No: 36060
NET Pacific Log No: 91.0011
Received: 10/16/1991

Client Reference Information

SHELL 1800 Powell St., Emeryville

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

Judy Putnam for
Jules Skamarack
Laboratory Manager

Enclosure(s)

NET Pacific, Inc

Client Acct: 36060 Date: 10/22/1991
Client Name: Gettler-Ryan, Inc. Page: 2
NET Log No: 91.0011

Ref: SHELL 1800 Powell St., Emeryville

SAMPLE DESCRIPTION: S-5
LAB Job No: (-100879

| Parameter | Reporting Limit | Results | Units |
|---|---|---|---|
| METHOD 5030 (GC,FID,Liquid) | | .. | |
| DATE ANALYZED | | 10-19-91 | |
| DILUTION FACTOR* | | 1 | |
| as Gasoline | 0.05 | 1.7 | mg/L |
| METHOD 8020 (GC,Liquid) | | .. | |
| DATE ANALYZED | | 10-18-91 | |
| DILUTION FACTOR* | | 1 | |
| Benzene | 0.0005 | 0.016 | mg/L |
| Ethylbenzene | 0.0005 | 0.0052 | mg/L |
| Toluene | 0.0005 | 0.0057 | mg/L |
| Xylenes (Total) | 0.0005 | 0.0089 | mg/L |

Ref: SHELL 1800 Powell St., Emeryville

SAMPLE DESCRIPTION: S-8
LAB Job No: (-100880

| Parameter | Reporting Limit | Results | Units |
|---|---|---|---|
| METHOD 5030 (GC,FID,Liquid) | | .. | |
| DATE ANALYZED | | 10-20-91 | |
| DILUTION FACTOR* | | 1 | |
| as Gasoline | 0.05 | 0.34 | mg/L |
| METHOD 8020 (GC,Liquid) | | .. | |
| DATE ANALYZED | | 10-20-91 | |
| DILUTION FACTOR* | | 1 | |
| Benzene | 0.0005 | 0.0040 | mg/L |
| Ethylbenzene | 0.0005 | ND | mg/L |
| Toluene | 0.0005 | 0.0006 | mg/L |
| Xylenes (Total) | 0.0005 | 0.017 | mg/L |

NET Pacific, Inc

Client Acct: 36060 Date: 10/22/1991
Client Name: Gettler-Ryan, Inc. Page: 4
NET Log No: 91.0011

Ref: SHELL 1800 Powell St., Emeryville

SAMPLE DESCRIPTION: SD-5
LAB Job No: (-100881

| Parameter | Reporting Limit | Results | Units |
|---|---|---|---|
| TPH (Gas/BTXE,Liquid) | | | |
| METHOD 5030 (GC,FID,Liquid) | | .. | |
| DATE ANALYZED | | 10-20-91 | |
| DILUTION FACTOR* | | 1 | |
| as Gasoline | 0.05 | 1.1 | mg/L |
| METHOD 8020 (GC,Liquid) | | .. | |
| DATE ANALYZED | | 10-18-91 | |
| DILUTION FACTOR* | | 1 | |
| Benzene | 0.0005 | 0.018 | mg/L |
| Ethylbenzene | 0.0005 | 0.0052 | mg/L |
| Toluene | 0.0005 | 0.0057 | mg/L |
| Xylenes (Total) | 0.0005 | 0.0089 | mg/L |

Ref: SHELL 1800 Powell St., Emeryville

SAMPLE DESCRIPTION: S-12
LAB Job No: (-100882

| Parameter | Reporting Limit | Results | Units |
|---|---|---|---|
| TPH (Gas/BTXE,Liquid) | | | |
| METHOD 5030 (GC,FID,Liquid) | | .. | |
| DATE ANALYZED | | 10-20-91 | |
| DILUTION FACTOR* | | 1 | |
| as Gasoline | 0.05 | 0.22 | mg/L |
| METHOD 8020 (GC,Liquid) | | .. | |
| DATE ANALYZED | | 10-20-91 | |
| DILUTION FACTOR* | | 1 | |
| Benzene | 0.0005 | 0.0021 | mg/L |
| Ethylbenzene | 0.0005 | ND | mg/L |
| Toluene | 0.0005 | 0.0007 | mg/L |
| Xylenes (Total) | 0.0005 | 0.0012 | mg/L |
| METHOD 3510 (GC, FID, LIQUID) | | | |
| DILUTION FACTOR* | | 2 | |
| DATE EXTRACTED | | 10-17-91 | |
| DATE ANALYZED | | 10-19-91 | |
| as Diesel | 0.05 | 2.5 | mg/L |
| as Motor Oil | 0.5 | 5.1 | mg/L |

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Client Acct: 36060 Date: 10/22/1991
Client Name: Gettler-Ryan, Inc. Page: 6
NET Log No: 91.0011

Ref: SHELL 1800 Powell St., Emeryville

SAMPLE DESCRIPTION: S-13
LAB Job No: (-100883

| Parameter | Reporting Limit | Results | Units |
|---|---|---|---|
| TPH (Gas/BTXE,Liquid) | | | |
| METHOD 5030 (GC,FID,Liquid) | | .. | |
| DATE ANALYZED | | 10-20-91 | |
| DILUTION FACTOR* | | 10 | |
| as Gasoline | 0.05 | 0.48 | mg/L |
| METHOD 8020 (GC,Liquid) | | .. | |
| DATE ANALYZED | | 10-20-91 | |
| DILUTION FACTOR* | | 10 | |
| Benzene | 0.0005 | 0.83 | mg/L |
| Ethylbenzene | 0.0005 | ND | mg/L |
| Toluene | 0.0005 | 0.015 | mg/L |
| Xylenes (Total) | 0.0005 | 0.12 | mg/L |
| METHOD 3510 (GC, FID, LIQUID) | | | |
| DILUTION FACTOR* | | 2 | |
| DATE EXTRACTED | | 10-17-91 | |
| DATE ANALYZED | | 10-19-91 | |
| as Diesel | 0.05 | 2.4 | mg/L |
| as Motor Oil | 0.5 | 4.9 | mg/L |

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Client Acct: 36060 Date: 10/22/1991
Client Name: Gettler-Ryan, Inc. Page: 7
NET Log No: 91.0011

Ref: SHELL 1800 Powell St., Emeryville

SAMPLE DESCRIPTION: S-14
LAB Job No: (-100884

| Parameter | Reporting Limit | Results | Units |
|---|---|---|---|
| TPH (Gas/BTXE,Liquid) | | | |
| METHOD 5030 (GC,FID,Liquid) | | .. | |
| DATE ANALYZED | | 10-21-91 | |
| DILUTION FACTOR* | | 5 | |
| as Gasoline | 0.05 | 4.9 | mg/L |
| METHOD 8020 (GC,Liquid) | | .. | |
| DATE ANALYZED | | 10-20-91 | |
| DILUTION FACTOR* | | 1 | |
| Benzene | 0.0005 | 0.007 | mg/L |
| Ethylbenzene | 0.0005 | ND | mg/L |
| Toluene | 0.0005 | 0.0012 | mg/L |
| Xylenes (Total) | 0.0005 | 0.025 | mg/L |
| METHOD 3510 (GC, FID, LIQUID) | | | |
| DILUTION FACTOR* | | 10 | |
| DATE EXTRACTED | | 10-17-91 | |
| DATE ANALYZED | | 10-19-91 | |
| as Diesel | 0.05 | 21 | mg/L |
| as Motor Oil | 0.5 | ND | mg/L |

Ref: SHELL 1800 Powell St., Emeryville

SAMPLE DESCRIPTION: Trip Blank
LAB Job No: (-100885

| Parameter | Reporting Limit | Results | Units |
|---|---|---|---|
| TPH (Gas/BTXE,Liquid) | | | |
| METHOD 5030 (GC,FID,Liquid) | | .. | |
| DATE ANALYZED | | 10-20-91 | |
| DILUTION FACTOR* | | 1 | |
| as Gasoline | 0.05 | ND | mg/L |
| METHOD 8020 (GC,Liquid) | | .. | |
| DATE ANALYZED | | 10-20-91 | |
| DILUTION FACTOR* | | 1 | |
| Benzene | 0.0005 | ND | mg/L |
| Ethylbenzene | 0.0005 | ND | mg/L |
| Toluene | 0.0005 | ND | mg/L |
| Xylenes (Total) | 0.0005 | ND | mg/L |
| METHOD 3510 (GC, FID, LIQUID) | | | |
| DILUTION FACTOR* | | 1 | |
| DATE EXTRACTED | | 10-17-91 | |
| DATE ANALYZED | | 10-19-91 | |
| as Diesel | 0.05 | ND | mg/L |
| as Motor Oil | 0.5 | ND | mg/L |

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Client Acct: 36060 Date: 10/22/1991
Client Name: Gettler-Ryan, Inc. Page: 9
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Ref: SHELL 1800 Powell St., Emeryville

QUALITY CONTROL DATA

| Parameter | Reporting Limits | Units | Cal Verf Stand % Recovery | Blank Data | Spike % Recovery | Duplicate Spike % Recovery | RPD |
|---|---|---|---|---|---|---|---|
| Gasoline | 0.05 | mg/L | 101 | ND | 99 | 90 | 9.5 |
| Benzene | 0.0005 | mg/L | 93 | ND | 101 | 96 | 4.9 |
| Toluene | 0.0005 | mg/L | 91 | ND | 100 | 95 | 5.1 |
| Gasoline | 0.05 | mg/L | N/A | ND | 121 | 108 | 11 |
| Benzene | 0.0005 | mg/L | 97 | ND | 104 | 107 | 2.8 |
| Toluene | 0.0005 | mg/L | 96 | ND | 105 | 112 | 6.5 |
| Gasoline | 0.05 | mg/L | N/A | ND | 113 | 113 | < 1 |
| Benzene | 0.0005 | mg/L | 98 | ND | 103 | 100 | 3.0 |
| Toluene | 0.0005 | mg/L | 102 | ND | 102 | 99 | 3.0 |
| Diesel | 0.005 | mg/L | 109 | ND | 132 | 99 | 29 |
| Motor Oil | 0.005 | mg/L | 98 | ND | N/A | N/A | N/A |

NET Pacific, Inc

## KEY TO ABBREVIATIONS and METHOD REFERENCES

| | | |
|---|---|---|
| < | : | Less than; When appearing in results column indicates analyte not detected at the value following. This datum supercedes the listed Reporting Limit. |
| * | : | Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated Reporting Limits by the dilution factor (but do not multiply reported values). |
| ICVS | : | Initial Calibration Verification Standard (External Standard). |
| mean | : | Average; sum of measurements divided by number of measurements. |
| mg/Kg (ppm) | : | Concentration in units of milligrams of analyte per kilogram of sampl (parts per million). |
| mg/L | : | Concentration in units of milligrams of analyte per liter of sample. |
| mL/L/hr | : | Milliliters per liter per hour. |
| MPN/100 mL | : | Most probable number of bacteria per one hundred milliliters of sampl |
| N/A | : | Not applicable. |
| NA | : | Not analyzed. |
| ND | : | Not detected; the analyte concentration is less than applicable liste reporting limit. |
| NTU | : | Nephelometric turbidity units. |
| RPD | : | Relative percent difference, 100 [Value 1 - Value 2]/mean value. |
| SNA | : | Standard not available. |
| ug/Kg (ppb) | : | Concentration in units of micrograms of analyte per kilogram of sampl (parts per billion). |
| ug/L | : | Concentration in units of micrograms of analyte per liter of sample. |
| umhos/cm | : | Micromhos per centimeter. |

Method References

Methods 100 through 493: see "Methods for Chemical Analysis of Water & Wastes", U.S. EPA, 600/4-79-020, rev. 1983.

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

SM: see "Standard Methods for the Examination of Water & Wastewater, 17th Edition, APHA, 1989.

Gettler-Ryan Inc. — ENVIRONMENTAL DIVISION — 1518 Chain of Custod

COMPANY Shell — JOB NO.

JOB LOCATION 1800 Powell St.

CITY Emeryville — PHONE NO. 783-7500

AUTHORIZED Tom Paulson — DATE 10-11-91 — P.O. NO. 3605.01

| SAMPLE ID | NO. OF CONTAINERS | SAMPLE MATRIX | DATE/TIME SAMPLED | ANALYSIS REQUIRED | SAMPLE CONDITION LAB ID |
|---|---|---|---|---|---|
| S-5 | 3 | $H_2O$ | 10-11-91 / 1233 | TPH (gas) BTXE | |
| S-8 | ↓ | | / 1140 | | |
| S-12 | 6 | | / 1220 | , Diesel | |
| S-13 | ↓ | | / 1158 | , ↓ | |
| S-14 | ↓ | | / 1130 | , ↓ | |
| SD-5 | 3 | | / — | | |
| Trip Blank | 2 | ↓ | — | , Diesel | |

RELINQUISHED BY: 10-11-91 1320 — RECEIVED BY: NEFRIG #1 10-11-91 1320

RELINQUISHED BY: Refrig #1 10-15-91 12:00 — RECEIVED BY: NET Courier 10/15/91

RELINQUISHED BY: NET Courier 10/15 — RECEIVED BY LAB: (LUIANES) 10/16/91 0800

DESIGNATED LABORATORY: NET PACIFIC — DHS #:

REMARKS: NORMAL TAT — Exp: 5461

Eng: J Brasted

custody sealed 10/15/91 @ 19:30 J.W. — WIC #: 204-2495-0101

DATE COMPLETED 10-11-91 — FOREMAN

ORIGINAL