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

October 25, 1991

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. Jack Brastad of Shell Oil Company, we are forwarding a copy of the Site Update report, dated October 22, 1991, for the above referenced location. The report presents the results of the ground-water sampling conducted during the third quarter of 1991.

Should have any questions or comments please do not hesitate to call.

Sincerely,

John Werfal
Project Manager

enclosure

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

GeoStrategies Inc.

SITE UPDATE

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

760501-12

October 22, 1991

GeoStrategies Inc.
2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545
(415) 352-4800

October 22, 1991

Gettler-Ryan Inc.
2150 West Winton Avenue
Hayward, California 94545

Attn: Mr. John Werfal

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 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 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 ± 0.01 foot. Corresponding elevations, referenced to Mean Sea Level (MSL) datum 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 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 observed in Well S-10 at 0.03 feet in measured thickness. 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 July 8, 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. The ground-water samples were analyzed by International Technology (IT) Analytical Services, a California State-certified laboratory located in San Jose, California.

TPH-Gasoline was detected in Wells S-5, S-8, S-12, S-13 and S-14, at concentrations ranging from 0.07 to 3.2 parts per million (ppm). Benzene concentrations in these wells ranged from 0.0025 ppm to 1.0 ppm. 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 (SD-5) 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,

Ellen C. Fostersmith

Ellen C. Fostersmith
Geologist

John F. Vargas

John F. Vargas
Senior Geologist
R.G. 5046

REGISTERED GEOLOGIST
JOHN F. VARGAS
NO. 5046
STATE OF CALIFORNIA

ECF/JFV/kjj

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:

760501-12

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	08-Jul-91	10	12.1	11.72	9.15	----	2.57	5	7.05	68.8	2400
S-8	08-Jul-91	3	19.3	12.76	10.45	----	2.31	3	7.28	69.3	6330
S-10	08-Jul-91	6	----	12.58	9.41	0.03	3.19	----	----	----	----
S-12	08-Jul-91	3	24.4	12.84	9.50	----	3.34	5	6.90	67.0	5810
S-13	08-Jul-91	3	20.1	12.59	10.38	----	2.21	3	7.27	68.9	9150
S-14	08-Jul-91	3	23.2	12.69	10.32	----	2.37	5	7.35	67.7	8210

Notes:
1. Static water elevations referenced to Mean Sea Level (MSL).
2. Physical parameter measurements represent stabilized values.
3. Static water-levels corrected for floating product (conversion factor = 0.80).
4. Well S-9 contained a tar-like substance, and was not monitored or sampled.

TABLE 2

GROUND-WATER ANALYSIS DATA

WELL NO	SAMPLE DATE	ANALYSIS DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
S-5	08-Jul-91	11-Jul-91	3.2	1.0	0.016	0.009	0.012
S-8	08-Jul-91	12-Jul-91	1.1	0.45	0.015	<0.0025	0.042
S-12	08-Jul-91	12-Jul-91	0.07	0.0025	0.0008	<0.0005	0.0024
S-13	08-Jul-91	12-Jul-91	1.5	0.88	0.010	0.006	0.16
S-14	08-Jul-91	13-Jul-91	0.19	0.0065	0.0006	0.0019	0.026
SD-5	08-Jul-91	11-Jul-91	3.1	1.1	0.018	0.010	0.011
TB	----	11-Jul-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
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.

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
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
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
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
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

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)
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
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
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
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
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

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

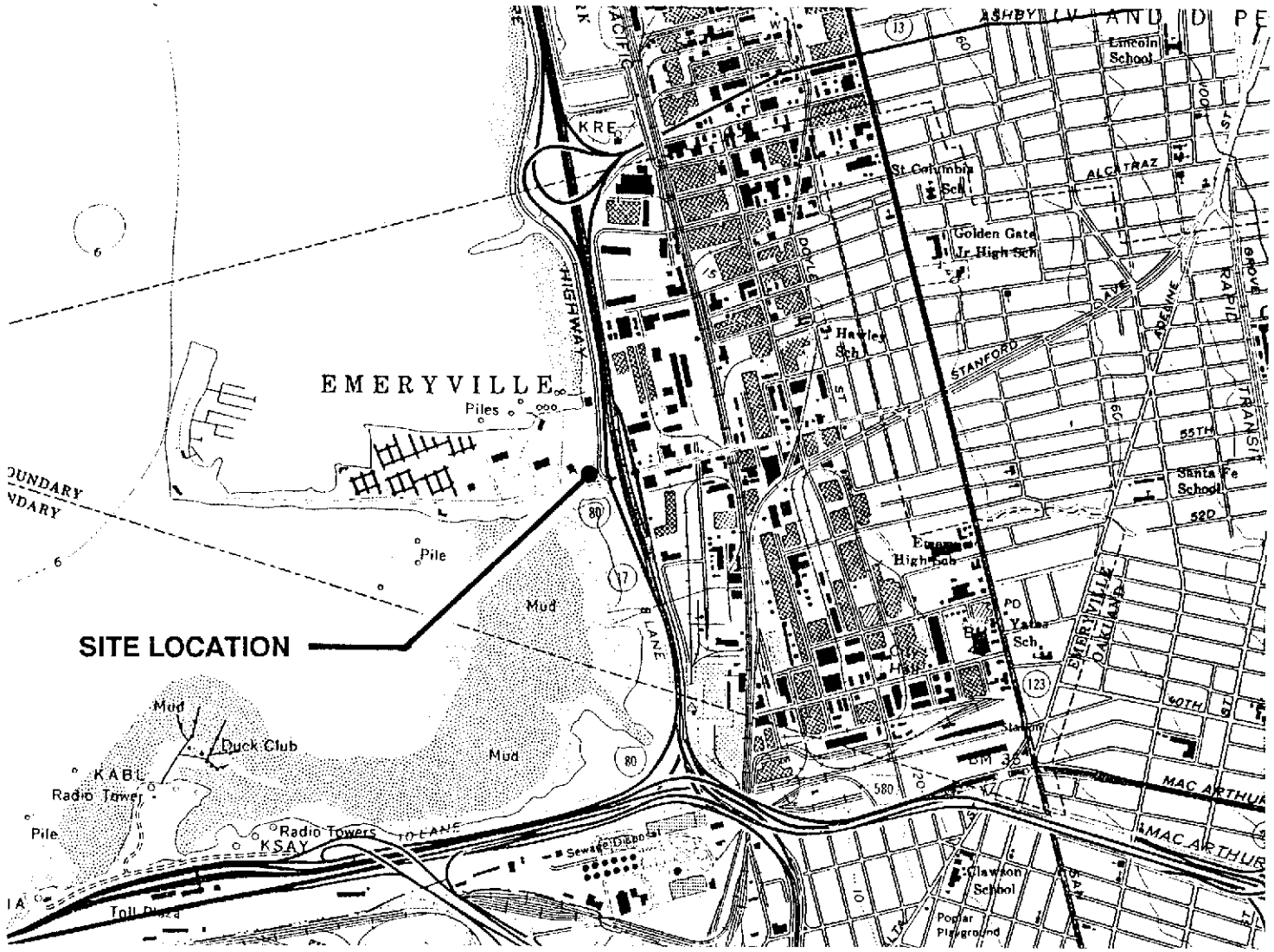
SAMPLE DATE	SAMPLE WELL	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TPH-D (PPM)	OIL (PPM)
23-Apr-91	S-14	1.2	0.0074	0.0027	0.015	0.11	18.&	<5.0
08-Jul-91	S-14	0.19	0.0065	0.0006	0.0019	0.026	N/A	N/A

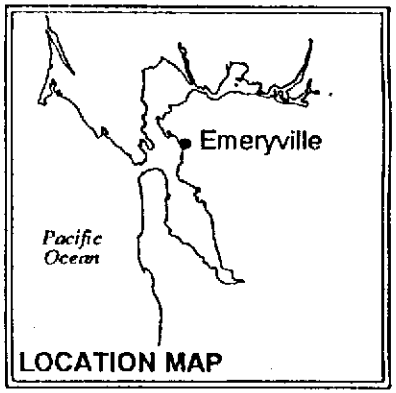
Current Regional Water Quality Control Board Maximum Contaminant Levels
Benzene 0.001 ppm Xylenes 1.750 ppm Ethylbenzene 0.680 ppm

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).





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0 2000

Scale in Feet

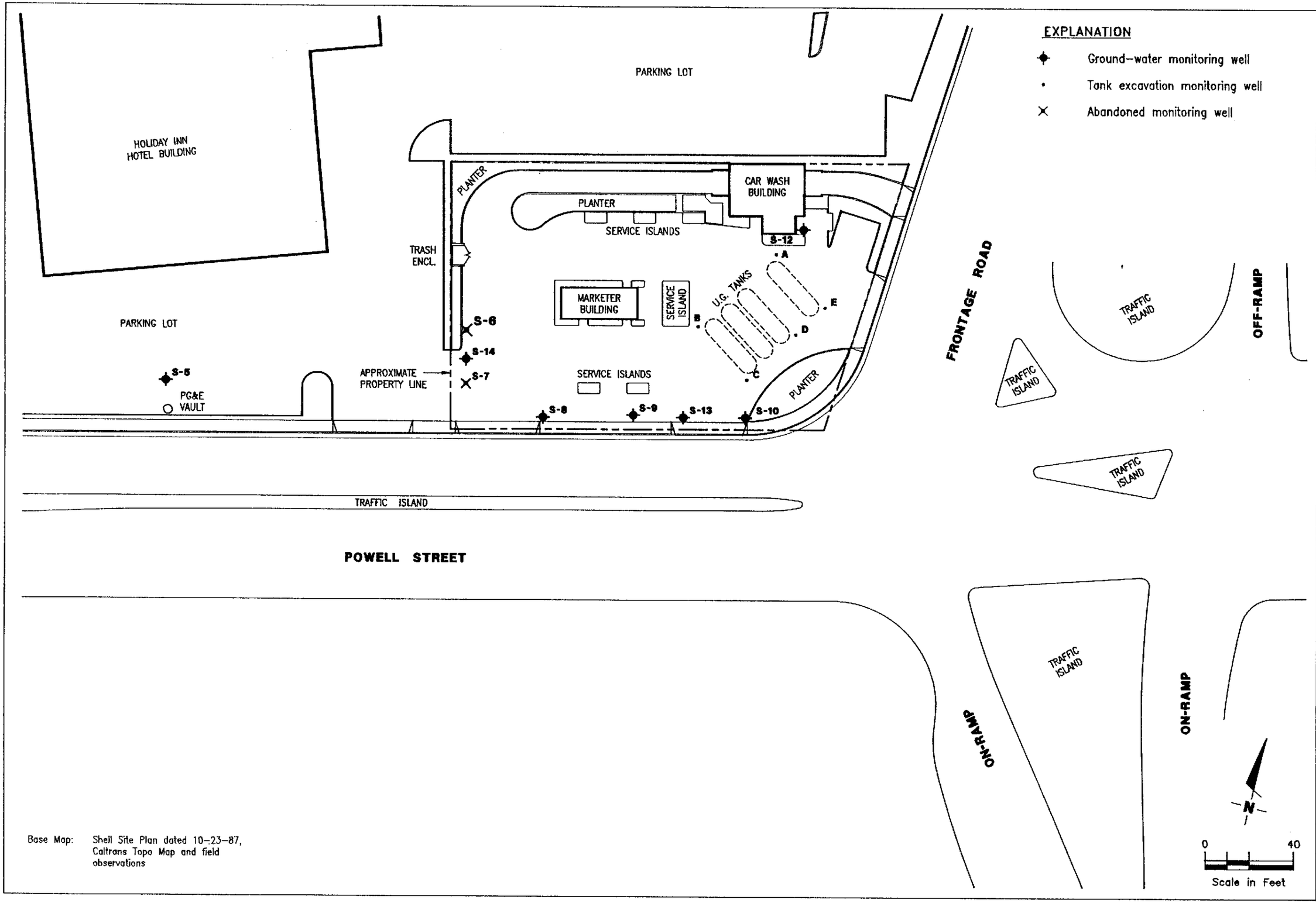
Base Map: USGS Topographic Map

GeoStrategies Inc.

VICINITY MAP
Shell Service Station
1800 Powell Street
Emeryville, California

PLATE 1

JOB NUMBER 7605 | REVIEWED BY | DATE | REVISED DATE



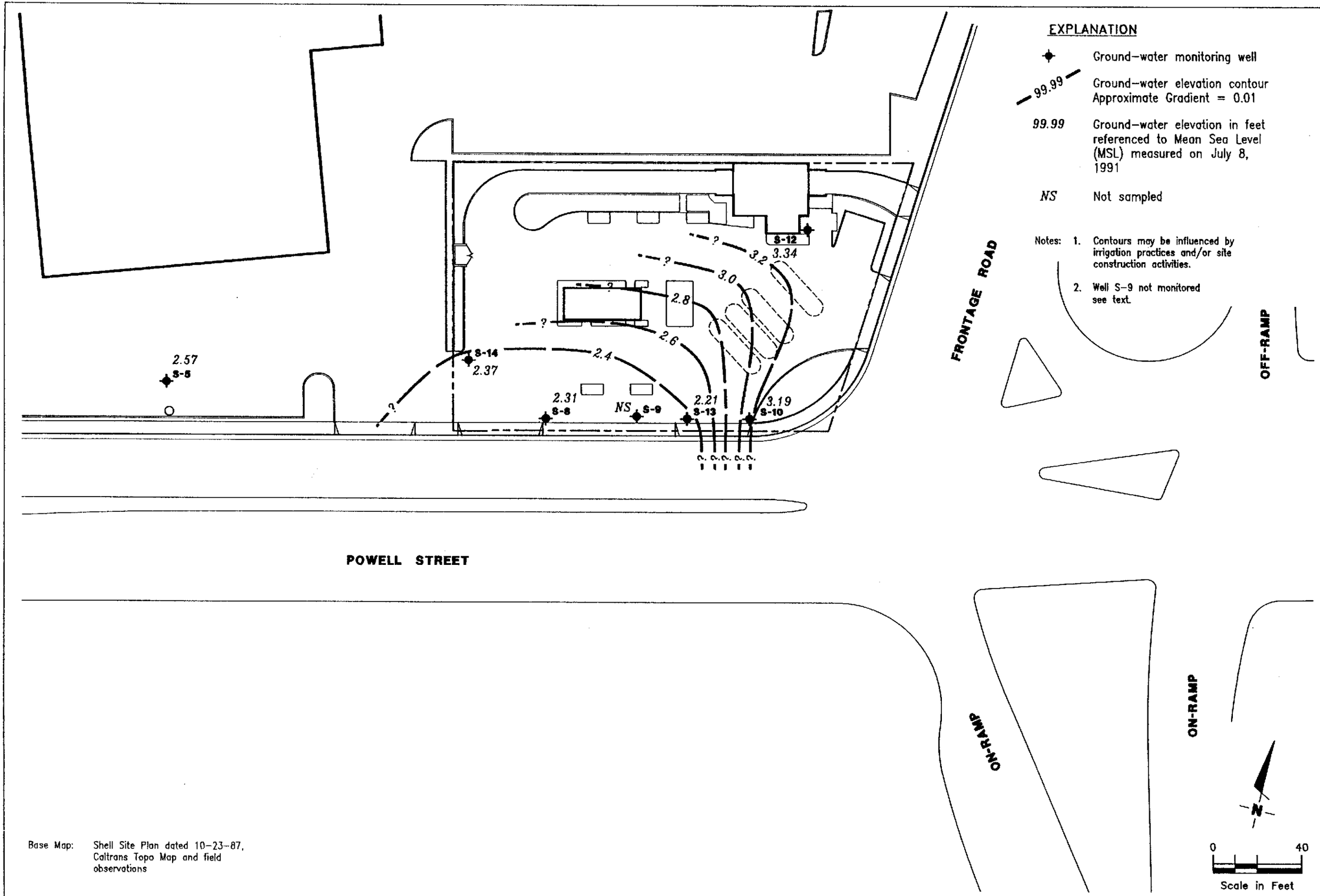
Base Map: Shell Site Plan dated 10-23-87, Caltrans Topo Map and field observations

PLATE 2

SITE PLAN
Shell Service Station
1800 Powell Street
Emeryville, California

GeoStrategies Inc.

JOB NUMBER 760501-12
REVIEWED BY CFS
DATE 10/91
REVISED DATE



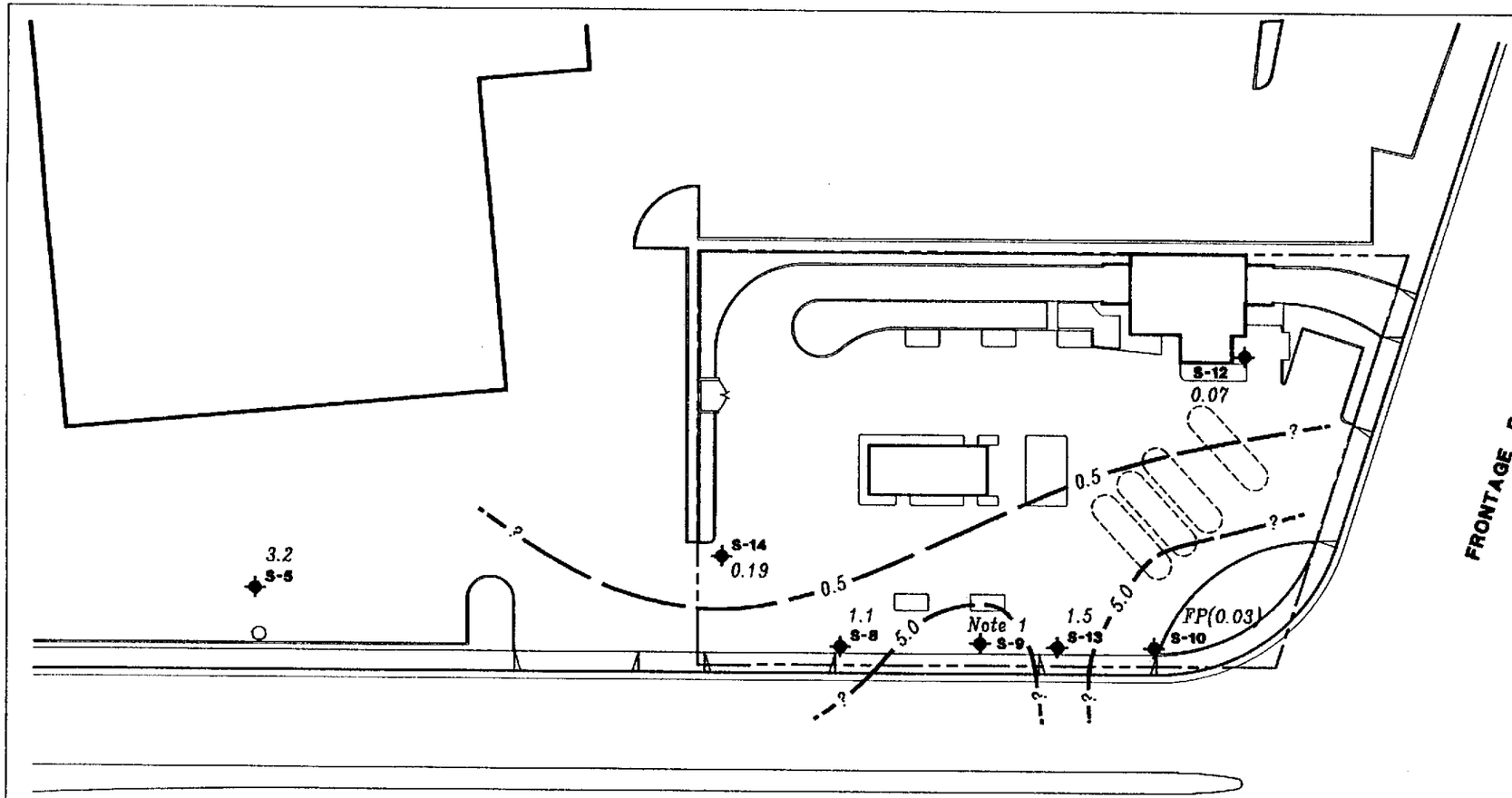
Base Map: Shell Site Plan dated 10–23–87, Caltrans Topo Map and field observations

PLATE 3

POTENTIOMETRIC MAP
Shell Service Station
1800 Powell Street
Emeryville, California

GeoStrategies Inc.

JOB NUMBER	DATE	REVIEWED BY	REVISED DATE
760501–12	10/91	RJS	



EXPLANATION

- ✦ Ground–water monitoring well
- *99/9.9* TPH–G (Total Petroleum Hydrocarbons calculated as Gasoline)/Benzene concentrations in ppm sampled on July 8, 1991
- *FP(0.01)* Floating Product (measured thicknes in feet)

Notes: 1. Floating Product thickness not measured; see text.

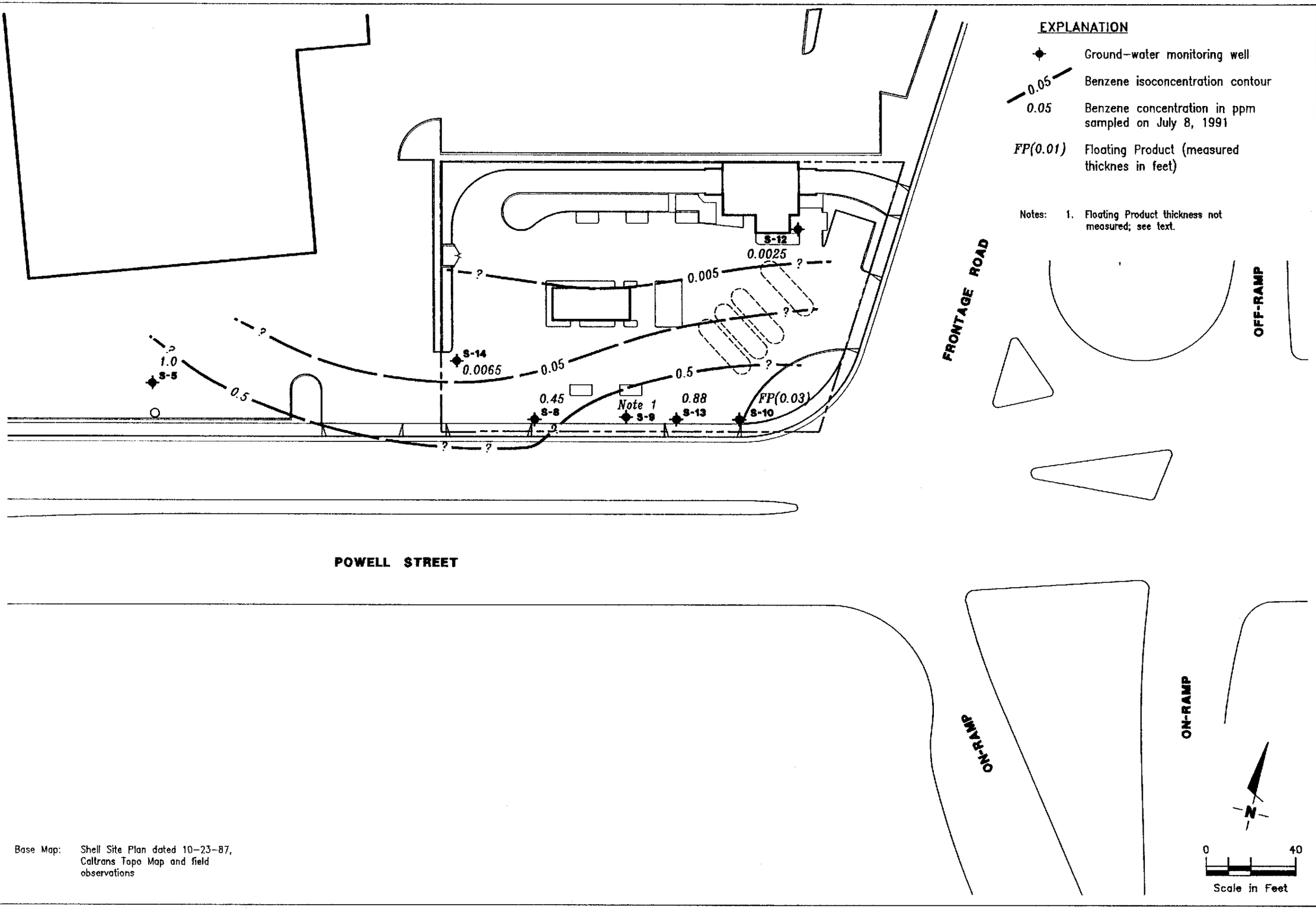
Base Map: Shell Site Plan dated 10–23–87, Caltrans Topo Map and field observations

PLATE 4

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

GeoStrategies Inc.

JOB NUMBER 760501–12
REVIEWED BY
DATE 10/91
REVISED DATE



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

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

PLATE **5**

REVISED DATE

DATE 10/91

REVIEWED BY RS

JOB NUMBER 760501-12

GeoStrategies Inc.

APPENDIX A
ANALYTICAL LABORATORY REPORT
AND CHAIN-OF-CUSTODY

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

RECEIVED

JUL 2 5 1991

GETTLER-RYAN INC.
GENERAL CONTRACTORS

CERTIFICATE OF ANALYSIS

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

Date: 07/22/91

Work Order: T1-07-113

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

This is the Certificate of Analysis for the following samples:

Client Work ID: GR3605, 1800 Powell St.Emryvl
Date Received: 07/10/91
Number of Samples: 7
Sample Type: aqueous

TABLE OF CONTENTS FOR ANALYTICAL RESULTS

Reviewed and Approved:

Suzanne Veaudry
Project Manager

Company: Shell Oil Company
Date: 07/22/91
Client Work ID: GR3605, 1800 Powell St.Emryvl

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order: T1-07-113

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-5**
SAMPLE DATE: **07/08/91**
LAB SAMPLE ID: **T107113-01**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/11/91
Low Boiling Hydrocarbons	Mod.8015		07/11/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.5	3.2
BTEX		
Benzene	0.005	1.0
Toluene	0.005	0.016
Ethylbenzene	0.005	0.009
Xylenes (total)	0.005	0.012

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	108.
1,3-Dichlorobenzene (BTEX)	95.

Company: Shell Oil Company
Date: 07/22/91
Client Work ID: GR3605, 1800 Powell St.Emryvl

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order: T1-07-113

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-8**
SAMPLE DATE: **07/08/91**
LAB SAMPLE ID: **T107113-02**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH > 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/12/91
Low Boiling Hydrocarbons	Mod.8015		07/12/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.25	1.1
BTEX		
Benzene	0.0025	0.45
Toluene	0.0025	0.015
Ethylbenzene	0.0025	None
Xylenes (total)	0.0025	0.042

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	101.
1,3-Dichlorobenzene (BTEX)	99.

Company: Shell Oil Company
Date: 07/22/91
Client Work ID: GR3605, 1800 Powell St.Emryvl

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order: T1-07-113

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-12**
SAMPLE DATE: **07/08/91**
LAB SAMPLE ID: **T107113-03**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/12/91
Low Boiling Hydrocarbons	Mod.8015		07/12/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	**0.07**
BTEX		
Benzene	0.0005	**0.0025**
Toluene	0.0005	**0.0008**
Ethylbenzene	0.0005	**None**
Xylenes (total)	0.0005	**0.0024**

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	111.
1,3-Dichlorobenzene (BTEX)	101.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 07/22/91
Client Work ID: GR3605, 1800 Powell St.Emryvl

Work Order: T1-07-113

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-13**
SAMPLE DATE: **07/08/91**
LAB SAMPLE ID: **T107113-04**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH > 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/12/91
Low Boiling Hydrocarbons	Mod.8015		07/12/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.5	**1.5**
BTEX		
Benzene	0.005	**0.88**
Toluene	0.005	**0.010**
Ethylbenzene	0.005	**0.006**
Xylenes (total)	0.005	**0.16**

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	100.
1,3-Dichlorobenzene (BTEX)	98.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 07/22/91
Client Work ID: GR3605, 1800 Powell St.Emryvl

Work Order: T1-07-113

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **S-14**
SAMPLE DATE: **07/08/91**
LAB SAMPLE ID: **T107113-05**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH > 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/13/91
Low Boiling Hydrocarbons	Mod.8015		07/13/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.05	**0.19**
BTEX		
Benzene	0.0005	**0.0065**
Toluene	0.0005	**0.0006**
Ethylbenzene	0.0005	**0.0019**
Xylenes (total)	0.0005	**0.026**

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	110.
1,3-Dichlorobenzene (BTEX)	103.

Company: Shell Oil Company
Date: 07/22/91
Client Work ID: GR3605, 1800 Powell St.Emryvl

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order: T1-07-113

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **SD-5**
SAMPLE DATE: **07/08/91**
LAB SAMPLE ID: **T107113-06**
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/11/91
Low Boiling Hydrocarbons	Mod.8015		07/11/91

PARAMETER	DETECTION LIMIT	DETECTED
Low Boiling Hydrocarbons calculated as Gasoline	0.5	3.1
BTEX		
Benzene	0.005	1.1
Toluene	0.005	0.018
Ethylbenzene	0.005	0.010
Xylenes (total)	0.005	0.011

SURROGATES	% REC
1,3-Dichlorobenzene (Gasoline)	105.
1,3-Dichlorobenzene (BTEX)	99.

Company: Shell Oil Company
Date: 07/22/91
Client Work ID: GR3605, 1800 Powell St.Emryvl

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order: T1-07-113

TEST NAME: **Petroleum Hydrocarbons**

SAMPLE ID: **Trip Blank**
SAMPLE DATE: **not spec**
LAB SAMPLE ID: T107113-07
SAMPLE MATRIX: **aqueous**
RECEIPT CONDITION: **Cool pH < 2**

RESULTS in Milligrams per Liter:

	METHOD	EXTRACTION DATE	ANALYSIS DATE
BTEX	8020		07/11/91
Low Boiling Hydrocarbons	Mod.8015		07/11/91

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)	98.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 07/22/91
Client Work ID: GR3605, 1800 Powell St.Emryvl

Work Order: T1-07-113

TEST NAME: **Spike and Spike Duplicates**

SAMPLE ID: **Quality Control**
SAMPLE DATE: **not spec**
LAB SAMPLE ID: T107113-08A
EXTRACTION DATE:
ANALYSIS DATE: 07/11/91
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	ND<50.	500.	442.	425.	88.	85.	3.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	106.	109.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 07/22/91
Client Work ID: GR3605, 1800 Powell St.Emryvl

Work Order: T1-07-113

TEST NAME: **Spike and Spike Duplicates**

SAMPLE ID: **Quality Control**
SAMPLE DATE: **not spec**
LAB SAMPLE ID: T107113-08B
EXTRACTION DATE:
ANALYSIS DATE: 07/12/91
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	50.0	49.4	50.3	99.	101.	2.
Toluene	ND<0.5	50.0	49.9	50.5	100.	101.	1.
Ethyl benzene	ND<0.5	50.0	50.5	51.1	101.	102.	1.
Xylenes	ND<0.5	150.	160.	162.	107.	108.	1.

SURROGATES	MS %Rec	MSD %Rec
1,3-Dichlorobenzene	100.	99.

IT ANALYTICAL SERVICES
SAN JOSE, CA

Company: Shell Oil Company
Date: 07/22/91
Client Work ID: GR3605, 1800 Powell St.Emryvl

Work Order: T1-07-113

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 **2599 Chain of Custody**

COMPANY Shell Oil Co JOB NO.

JOB LOCATION 1800 Powell St

CITY Emeryville PHONE NO. 783-7500

AUTHORIZED Tom Poulson DATE 7-8-91 P.O. NO. 3605.01

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
S-5	3	Liquid	7-8-91/1336	TPH Gas, BTXE	OK/Cold
S-8	↓	↓	/1347	↓	↓
S-12	↓	↓	/1355	↓	↓
S-13	↓	↓	/1350	↓	↓
S-14	↓	↓	/1310	↓	↓
SD-5	↓	↓	/ —	↓	↓
Trip Blank	1	↓	—	↓	↓

RELINQUISHED BY: [signature] 7-8-91 1500

RECEIVED BY: [signature] #1 7-8-91 1500

RELINQUISHED BY: [signature] #1 7-10-91 10:00

RECEIVED BY: [signature] 7-10-91 10:00

RELINQUISHED BY: [signature] 7-10-91 14:00

RECEIVED BY LAB: J. DeHerrera 7/10/91 14:00

DESIGNATED LABORATORY: IT (SCV) DHS #: 137

REMARKS: Normal TAT

WIC #: 204-2495-0101

Exp: 5461

Engr: J. Bristed

DATE COMPLETED FOREMAN [signature]

DUPLICATE