GeoStrategies Inc.

SITE UPDATE

UNOCAL Service Station No. 5760
376 Lewelling Boulevard
San Lorenzo, California

780901-7

December 12, 1991

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

December 12, 1991

UNOCAL Corporation
P.O. Box 5155
San Ramon, California 94583

Attn: Mr. Ron Bock

Re: SITE UPDATE
UNOCAL Service Station No. 5760
376 Lewelling Boulevard
San Lorenzo, California

Gentlemen:

This Site Update by GeoStrategies Inc. (GSI) presents the results of the 1991 third quarter ground-water sampling performed by Gettler-Ryan Inc. (G-R) on September 19, 1991, for the above referenced site (Plate 1). The scope of work presented in this document was performed at the request of UNOCAL Corporation. Field work and laboratory analysis methods were performed to comply with current State of California Water Resources Control Board guidelines. G-R groundwater sampling procedures were presented in a GSI Site Update/Work Plan dated February 22, 1991.

SITE BACKGROUND

The underground storage tanks were removed and replaced in November, 1987. There are currently four on-site monitoring wells; U-1 through U-4 (Plate 2). Well U-1 was installed by Woodward-Clyde Consultants (WCC) in February 1988. During August 1990 GSI installed Wells U-2 through U-4. These wells were installed to evaluate the vertical and horizontal extent of petroleum hydrocarbons in the soil and groundwater beneath the site.

Ground-water monitoring and sampling of wells began in February, 1988 with quarterly sampling beginning in March 1990. 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 Mean Sea Level (MSL) are presented in Table 1. Water-level data were used to construct a quarterly potentiometric map (Plate 3). The hydraulic gradient of the first encountered water-bearing zone was calculated to be 0.002 with ground-water flow to the southwest.

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 measured in Well U-1 at a thickness of 0.04 feet.

Ground-water Analytical Data

Prior to collecting samples, monitoring wells were purged until ground-water physical parameters stabilized. Purge volumes and physical parameter values are presented in Table 1. Ground-water samples were collected on September 19, 1991. The samples were analyzed for TPH-Gasoline according EPA Method 8015 (Modified) and BTEX according to EPA Method 8020 by Sequoia Analytical (Sequoia), a State-certified laboratory located in Redwood City, California.

TPH-Gasoline and Benzene were detected in Well U-3 at concentrations of 61,000 and 3,300 parts per billion (ppb), respectively. Wells U-2 and U-4 were reported as none detected (ND) for both TPH-Gasoline and Benzene. These data are summarized in Table 2. Historical chemical analytical data have been tabulated and presented in Table 3. A chemical concentration map for TPH-Gasoline and benzene is presented on Plate 4. The laboratory chemical analytical report and Chain-of-Custody form are presented in Appendix A.

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 and field handling of samples and analytical procedures. The results of QC sample analyses are presented in Table 2.

If you have any questions, please call.

GeoStrategies Inc. by,

Cliff M. Garratt
Hydrogeologist

John F. Vargas
Senior Geologist
R.G 5046

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

CMG/JFV/dls

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

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

QC Review: DJV

780901-7

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 (u MHOS/CM)
U-1	19-Sep-91	3	27.8	40.51	19.74	0.04	20.80	----	----	----	----
U-2	19-Sep-91	3	30.2	41.62	20.82	----	20.80	5	6.90	67.0	768
U-3	19-Sep-91	3	25.4	39.64	19.15	----	20.49	2	6.62	72.2	1015
U-4	19-Sep-91	3	28.1	40.53	20.0	----	20.53	3	6.77	71.0	879

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).

TABLE 2

GROUND-WATER ANALYSES DATA

WELL NO	SAMPLE DATE	ANALYZED DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
U-2	19-Sep-91	02-Oct-91	<30	<0.30	<0.30	<0.30	<0.30
U-3	19-Sep-91	02-Oct-91	61000	3300	9700	2800	15000
U-4	19-Sep-91	02-Oct-91	<30	<0.30	<0.30	<0.30	<0.30
TB	----	02-Oct-91	<30	<0.30	<0.30	<0.30	<0.30

U1 Grad FP

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPB = Parts Per Billion TB = Trip Blank

Notes: 1. All data shown as <x are reported as ND (none detected).

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
09-Feb-88	U-1	93000.	3600.	11000.	----	20000.
20-Mar-90	U-1	36000.	2100.	5500.	1900.	9300.
05-Jun-90	U-1	46000.	2300.	5500.	2500.	11000.
24-Aug-90	U-1	27000.	1200.	1800.	1400.	5500.
23-Aug-90	U-2	<50.	<0.5	<0.5	<0.5	<0.5
05-Dec-90	U-2	<50	<0.3	<0.3	<0.3	<0.3
04-Mar-91	U-2	<50.	<0.5	0.9	<0.5	2.6
03-Jun-91	U-2	<30	<0.30	<0.30	<0.30	<0.30
19-Sep-91	U-2	<30	<0.30	<0.30	<0.30	<0.30
23-Aug-90	U-3	110000.	4400.	13000.	2800.	17000.
05-Dec-90	U-3*	69000	1900	3500	1600	9800
18-Jan-91	U-3	51000.	1700.	3100.	1500.	7500.
04-Mar-91	U-3	84000.	1400.	10000.	2900.	17000.
03-Jun-91	U-3	130000	5800	19000	4600	24000
19-Sep-91	U-3	61000	3300	9700	2800	15000
23-Aug-90	U-4	<50.	<0.5	1.0	<0.5	1.8
05-Dec-90	U-4*	<50	<0.3	<0.3	<0.3	<0.3
18-Jan-91	U-4	<50.	<0.5	<0.5	<0.5	<0.5
04-Mar-91	U-4	<50.	<0.5	<0.5	<0.5	<0.5
03-Jun-91	U-4	<30	<0.30	<0.30	<0.30	<0.30
19-Sep-91	U-4	<30	<0.30	<0.30	<0.30	<0.30

TABLE 3

HISTORICAL GROUND-WATER QUALITY DATABASE

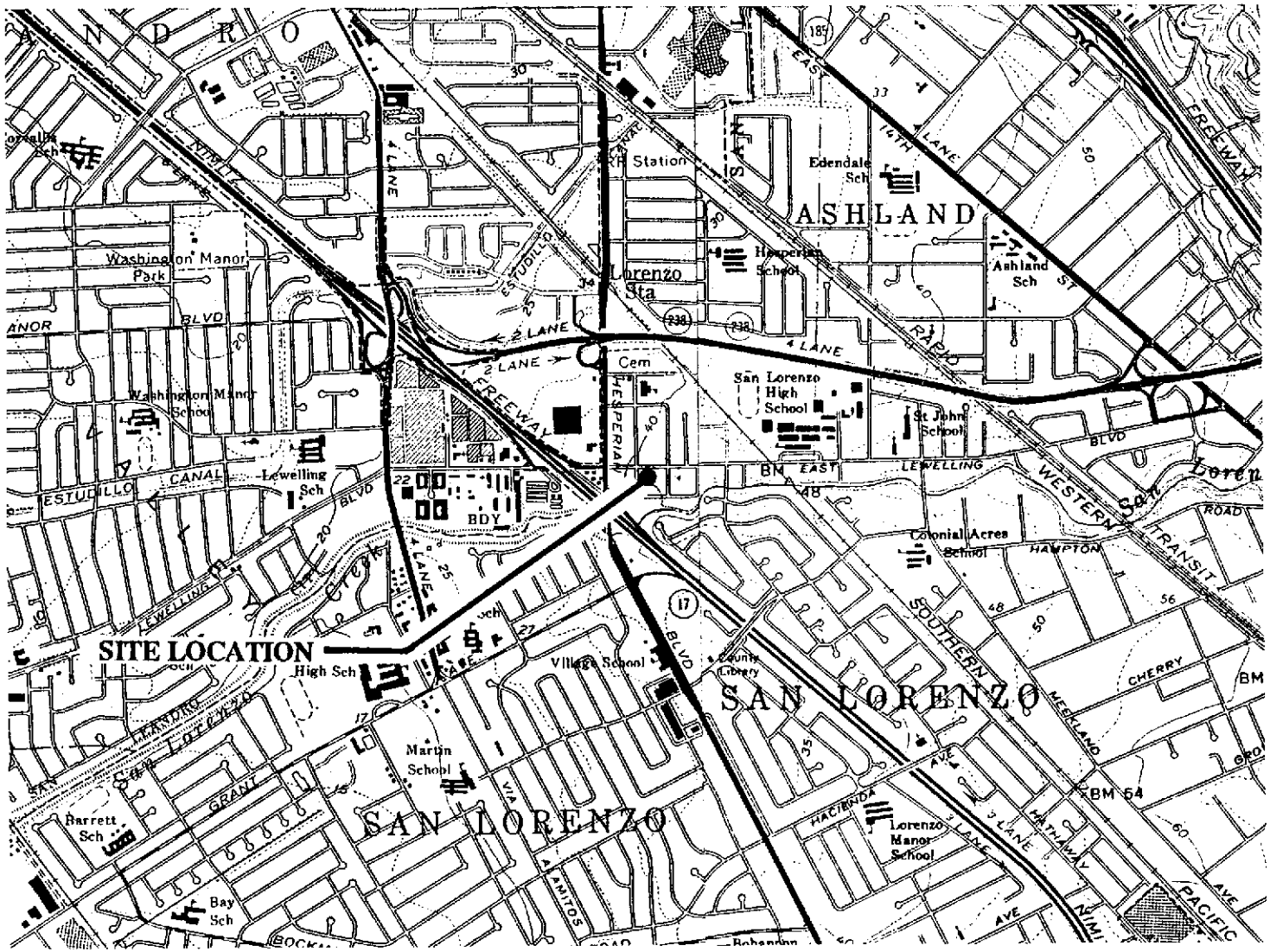
TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline

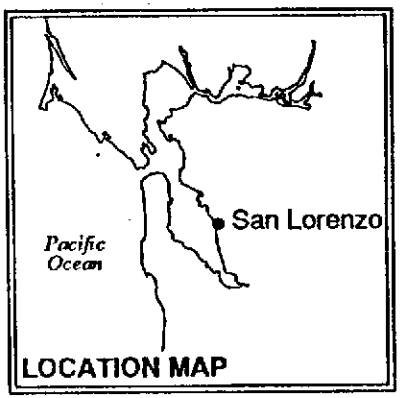
PPB = Parts Per Billion

NOTE: 1. All data shown as <X are reported as ND (none detected).

2. *Analytical data for Wells U-3 and U-4 have been changed to reflect the correct values.

3. Ethylbenzene and Xylenes were combined prior to March 1990.





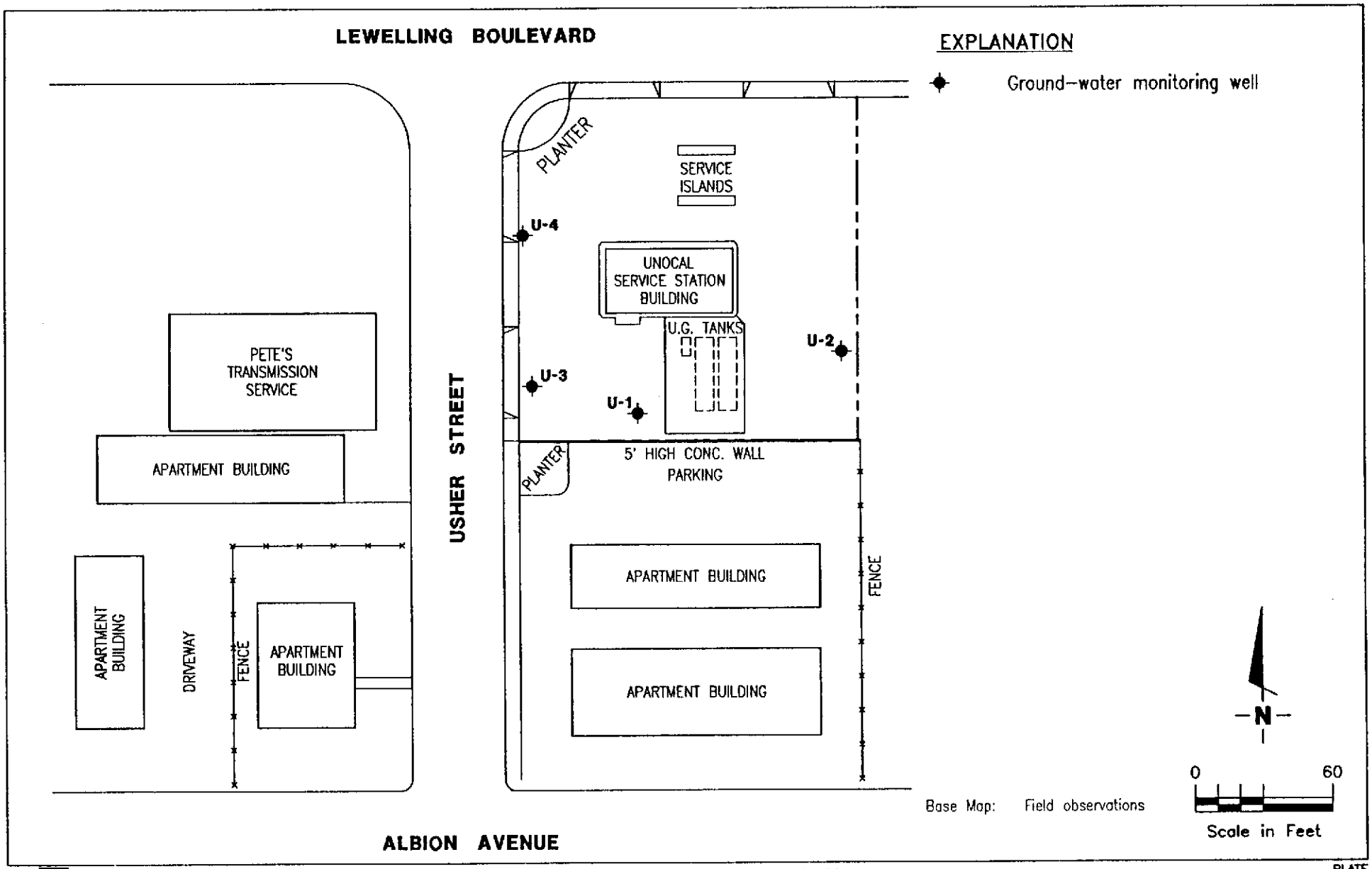
Base Map: USGS Topographic Map

GeoStrategies Inc.

VICINITY MAP
UNOCAL Service Station #5760
376 Lewelling Boulevard
San Lorenzo, California

PLATE 1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7809		2/91	

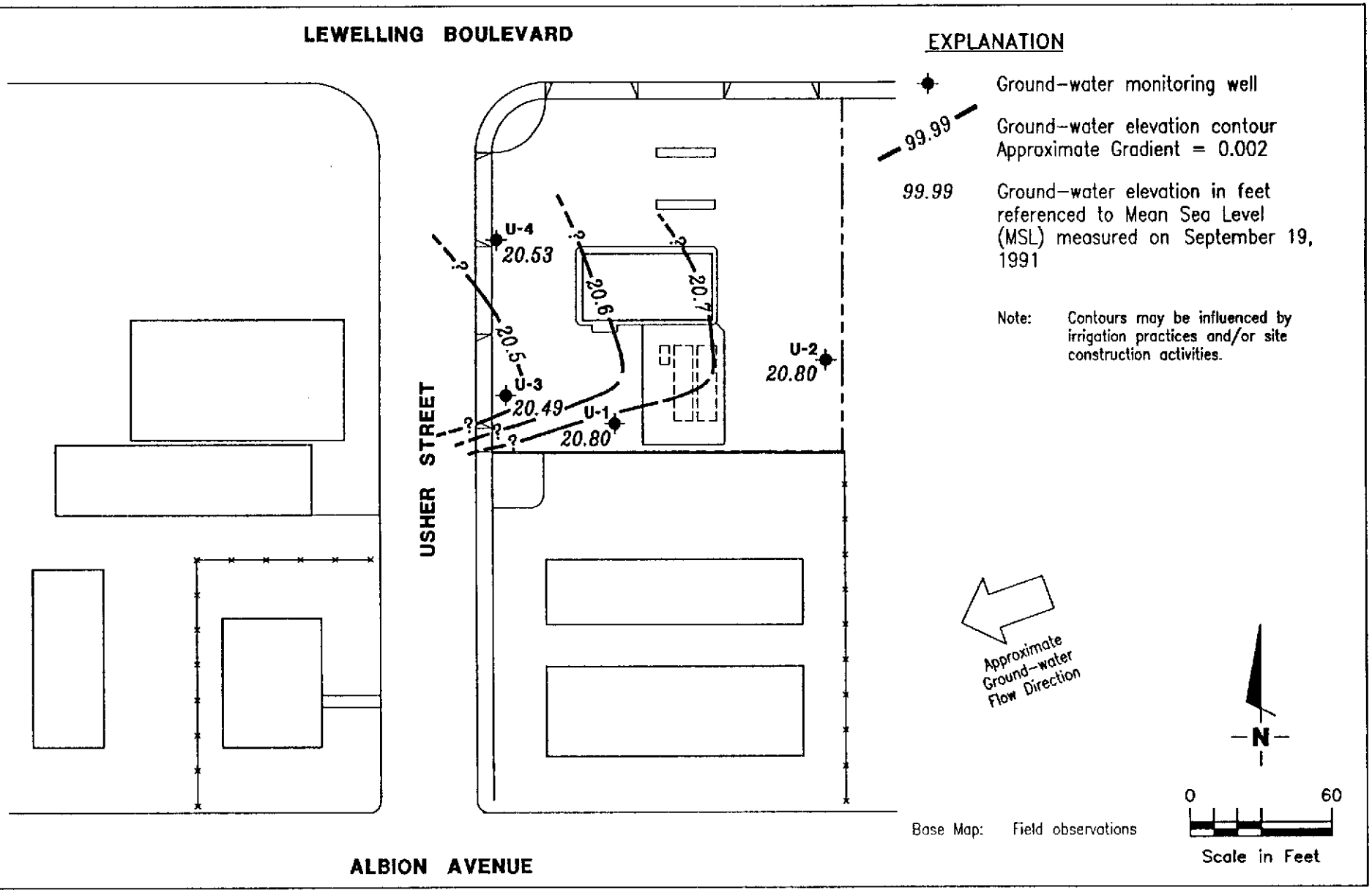


GeoStrategies Inc.

EXTENDED SITE PLAN
UNOCAL Service Station #5760
376 Lewelling Boulevard
San Lorenzo, California

PLATE 2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
780901-7		10/91	

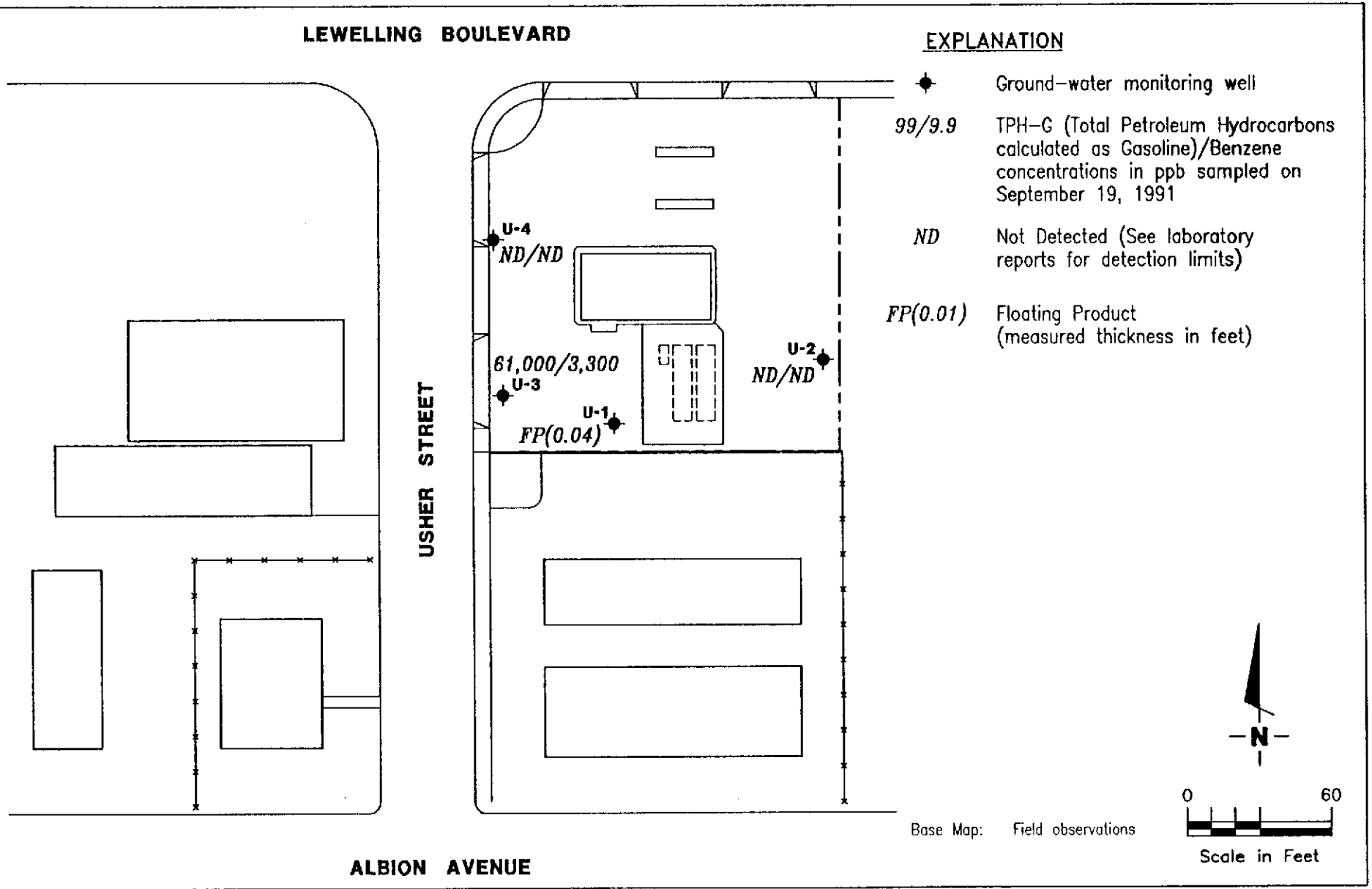


GeoStrategies Inc.

POTENTIOMETRIC MAP
UNOCAL Service Station #5760
376 Lewelling Boulevard
San Lorenzo, California

PLATE
3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
780901-7		10/91	



GeoStrategies Inc.

TPH-G/BENZENE CONCENTRATION MAP
UNOCAL Service Station #5760
376 Lewelling Boulevard
San Lorenzo, California

PLATE
4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
780901-7	JPV	10/91	

APPENDIX A
LABORATORY ANALYTICAL REPORT
CHAIN-OF-CUSTODY FORM

SEQUOIA ANALYTICAL

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

Gettler Ryan	Client Project ID:	3809, Unocal, San Lorenzo	Sampled:	Sep 19, 1991
2150 W. Winton Avenue	Matrix Descript:	Water	Received:	Sep 23, 1991
Hayward, CA 94545	Analysis Method:	EPA 5030/8015/8020	Analyzed:	Oct 2, 1991
Attention: Tom Paulson	First Sample #:	109-4145	Reported:	Oct 10, 1991

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
109-4145	U-2	N.D.	N.D.	N.D.	N.D.	N.D.
109-4146	U-3	61,000	3,300	9,700	2,800	15,000
109-4147	U-4	N.D.	N.D.	N.D.	N.D.	N.D.
109-4148	Trip Blank	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

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

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

Please Note:
Amended report dated: 10/17/91

1094145.GET <1>

SEQUOIA ANALYTICAL

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

Gettler Ryan
2150 W. Winton Avenue
Hayward, CA 94545
Attention: Tom Paulson

Client Project ID: 3809, Unocal, San Lorenzo

QC Sample Group: 1094145, 48

Reported: Oct 10, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	R. Eastman	R. Eastman	R. Eastman	R. Eastman
Reporting Units:	µg/L	µg/L	µg/L	µg/L
Date Analyzed:	Oct 2, 1991	Oct 2, 1991	Oct 2, 1991	Oct 2, 1991
QC Sample #:	BLK100291	BLK100291	BLK100291	BLK100291
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	10	10	10	30
Conc. Matrix Spike:	11	11	11	32
Matrix Spike % Recovery:	110	110	110	107
Conc. Matrix Spike Dup.:	11	11	11	32
Matrix Spike Duplicate % Recovery:	110	110	110	107
Relative % Difference:	0.0	0.0	0.0	0.0

SEQUOIA ANALYTICAL

Vickie Tague
Project Manager

% Recovery: $\frac{\text{Conc. of M.S. - Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$

Relative % Difference: $\frac{\text{Conc. of M.S. - Conc. of M.S.D.}}{\text{(Conc. of M.S. + Conc. of M.S.D.) / 2}} \times 100$

Gettler - Ryan Inc. — ENVIRONMENTAL DIVISION — 2758 Chain of Custody

COMPANY Unocal — JOB NO. _____

JOB LOCATION 3726 Lewelling

CITY San Lorenzo — PHONE NO. 783-7500

AUTHORIZED Tom Pawson — DATE 9-19-91 — P.O. NO. 3809.01

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
U-2	3	H_2O	9-19-91 / 1310	TPH(gas) BTXE 8020	
U-3	↓	↓	/ 1333	↓	
U-4	↓	↓	/ 1322	↓	
Trip Blank	1	↓	—	↓	

RELINQUISHED BY: 9/19/91 1400 — RECEIVED BY: REFRIG #1 9/19/91 1400

RELINQUISHED BY: Refrig #1 9-23-91 08:00 — RECEIVED BY: 9-23-91 08:0

RELINQUISHED BY: 9-23-91 1400 — RECEIVED BY LAB: 9/23 9:05

DESIGNATED LABORATORY: ~~[illegible]~~ Seq — DHS #: ~~[illegible]~~

REMARKS: NORMAL TAT

DATE COMPLETED 9-19-91 — FOREMAN _____

ORIGINAL