



GeoStrategies Inc.

SITE UPDATE

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

780901-6

August 16, 1991

RECEIVED

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GeoStrategies Inc.

2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545

GETTLER-RYAN INC.

GENERAL CONTRACTORS
(415) 352-4800

August 16, 1991

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

Attn: Mr. Keith Bullock

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 second quarter ground-water sampling performed by Gettler-Ryan Inc. (G-R) on June 3, 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 completed 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.

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Gettler-Ryan Inc.
August 16, 1991
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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 0.003 with ground-water flow generally to the west.

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 0.06 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 June 3, 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.

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Gettler-Ryan Inc.
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TPH-Gasoline and Benzene were detected in Well U-3 at concentrations of 130,000 and 5,800 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



David H. Peterson
C.E.G. 1186



CMG/DHP/mlg

- 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

780901-6


QC Review: 

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 (μ MHOS/CM)
U-1	03-Jun-91	3	----	40.51	18.76	0.06	21.80	----	----	----	----
U-2	03-Jun-91	3	30.1	41.62	19.60	----	22.02	5	7.01	65.6	869
U-3	03-Jun-91	3	25.4	39.64	17.98	----	21.66	3	6.88	68.4	1204
U-4	03-Jun-91	3	28.1	40.53	18.82	----	21.71	3	6.94	68.7	1077

- Notes: 1. Static water elevations referenced to Mean Sea Level (MSL).
 2. Physical parameter measurements represent stabilized values.
 3. pH values reported in pH units.
 4. 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	03-Jun-91	05-Jun-91	<30	<0.30	<0.30	<0.30	<0.30
U-3	03-Jun-91	05-Jun-91	130,000	5,800	19,000	4,600	24,000
U-4	03-Jun-91	05-Jun-91	<30	<0.30	<0.30	<0.30	<0.30
TB	----	05-Jun-91	<30	<0.30	<0.30	<0.30	<0.30

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
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
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

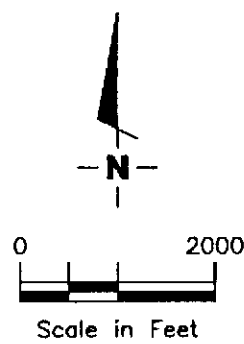
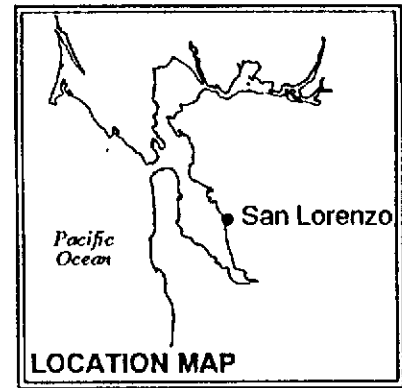
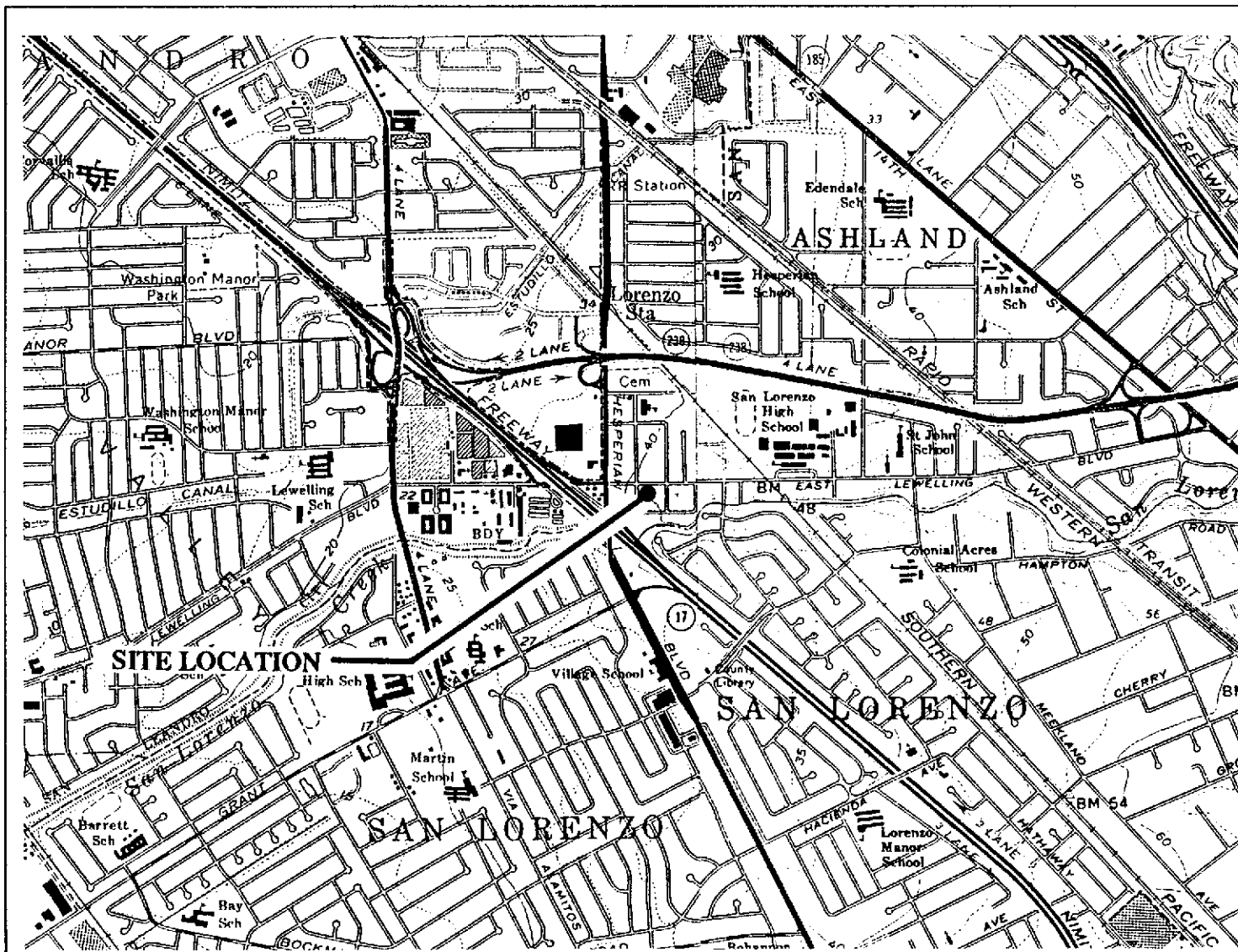
TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline

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
7809

REVIEWED BY

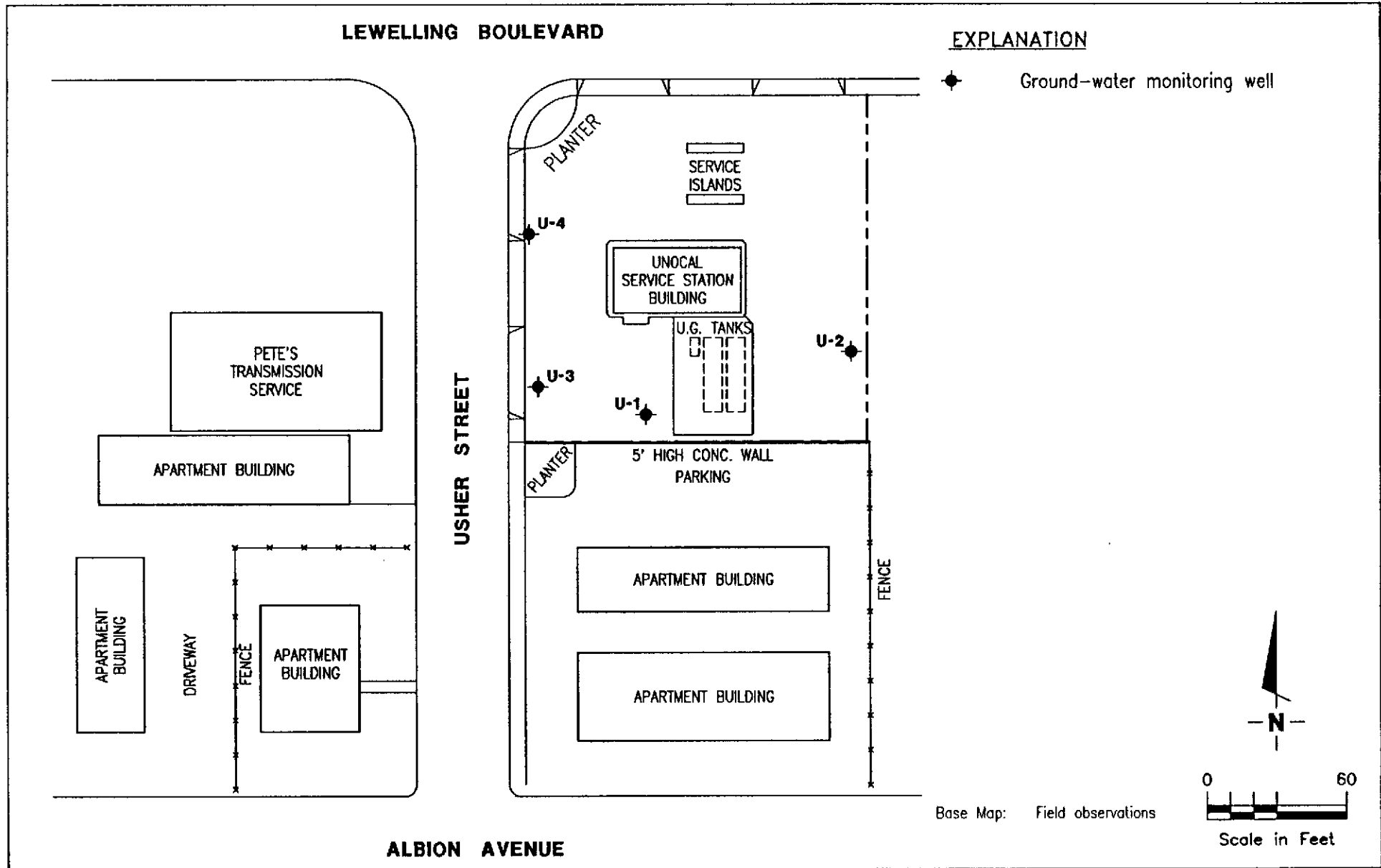
DATE
2/91

REVISED DATE

LEWELLING BOULEVARD

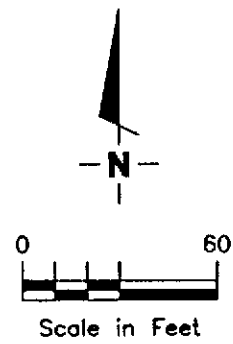
EXPLANATION

◆ Ground-water monitoring well



ALBION AVENUE

Base Map: Field observations



GeoStrategies Inc.

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

PLATE
2

JOB NUMBER
780901-6


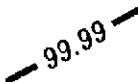
REVIEWED BY
DHP

DATE
7/91

REVISED DATE

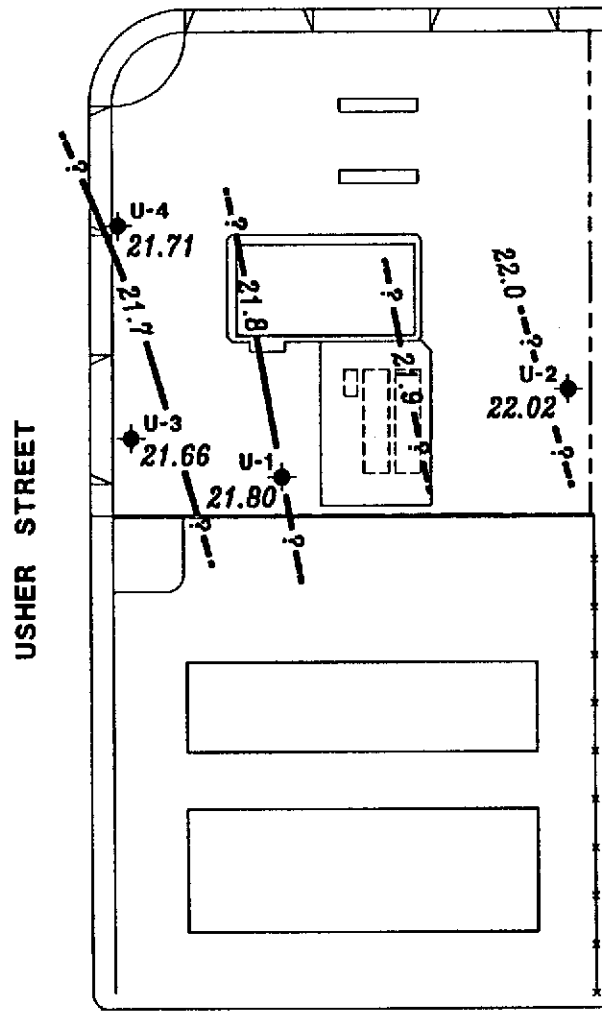
LEWELLING BOULEVARD

EXPLANATION

-  Ground-water monitoring well
-  Ground-water elevation contour
Approximate Gradient = 0.003
- 99.99 Ground-water elevation in feet
referenced to Mean Sea Level
(MSL) measured on June 3,
1991

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

USHER STREET



Approximate Ground-water Flow Direction



Base Map: Field observations

ALBION AVENUE



GeoStrategies Inc.

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

PLATE
3

JOB NUMBER
780901-6

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DHP

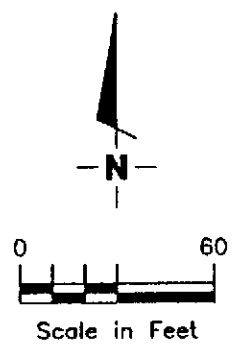
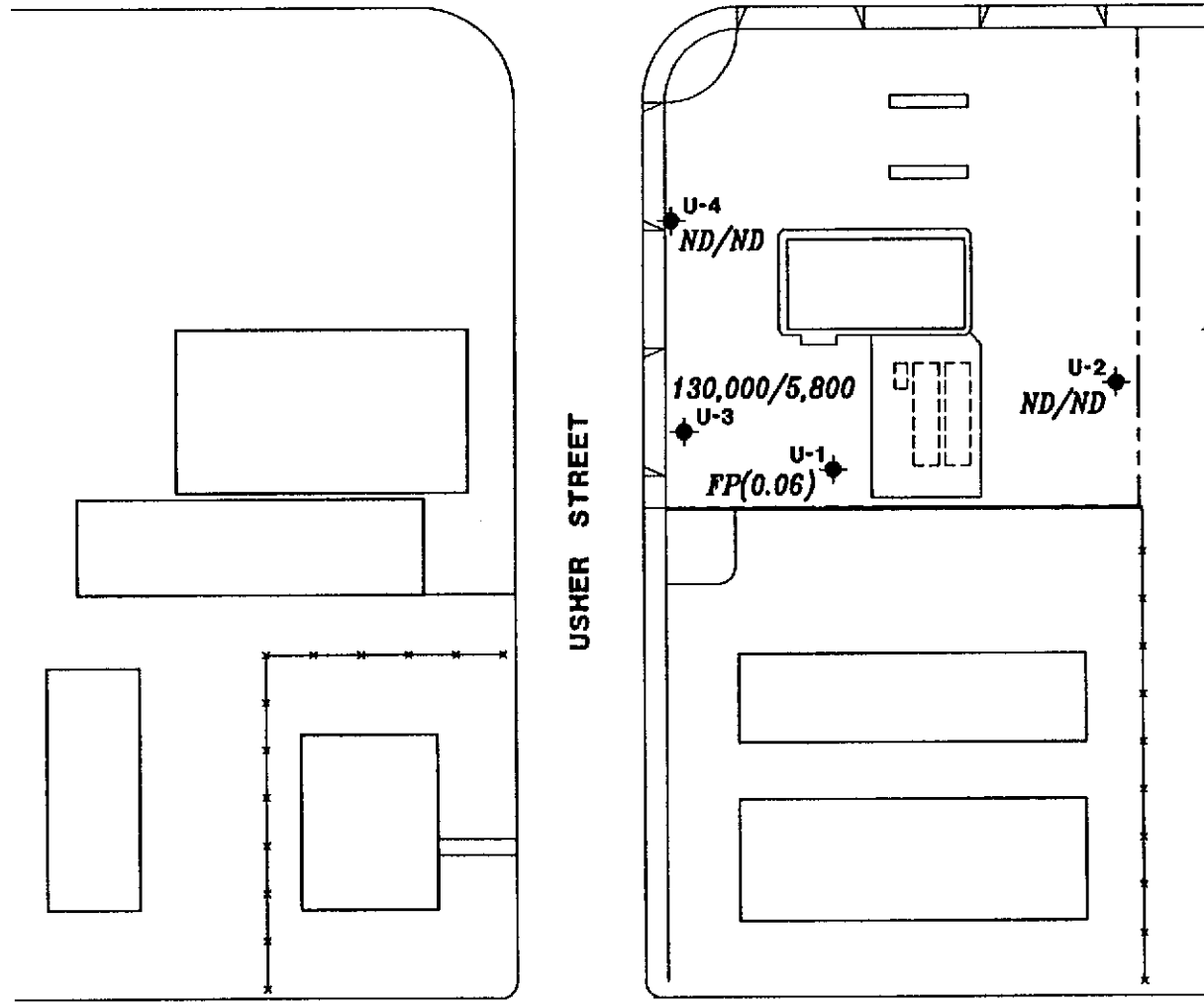
DATE
7/91

REVISED DATE

LEWELLING BOULEVARD

EXPLANATION

- ◆ Ground-water monitoring well
- 99/9.9 TPH-G (Total Petroleum Hydrocarbons calculated as Gasoline)/Benzene concentrations in ppb sampled on June 3, 1991
- ND Not Detected (See laboratory reports for detection limits)
- FP(0.01) Floating Product (measured thickness in feet)



Base Map: Field observations

ALBION AVENUE



GeoStrategies Inc.

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

PLATE
4

JOB NUMBER
780901-6

REVIEWED BY
DHP

DATE
7/91

REVISED DATE

GeoStrategies Inc.

**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

RECEIVED

JUN 19 1991

GETTLER-RYAN INC.
GENERAL CONTRACTORS

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

Client Project ID: #3809.01, Unocal, San Lorenzo
Matrix Descript: Water
Analysis Method: EPA 5030/8015/8020
First Sample #: 106-0373

Sampled: Jun 3, 1991
Received: Jun 4, 1991
Analyzed: Jun 5, 1991
Reported: Jun 18, 1991

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons	Benzene	Toluene	Ethyl Benzene	Xylenes
		$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)
106-0373	U-2	N.D.	N.D.	N.D.	N.D.	N.D.
106-0374	U-3	130,000	5,800	19,000	4,600	24,000
106-0375	U-4	N.D.	N.D.	N.D.	N.D.	N.D.
106-0376	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

V. Tague
Vickie Tague
Project Manager



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: #3809.01, Unocal, San Lorenzo

Q C Sample Group: 1060373, 76

Reported: Jun 18, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
---------	---------	---------	---------------	---------

Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	J. Dinsay	J. Dinsay	J. Dinsay	J. Dinsay
Reporting Units:	ng	ng	ng	ng
Date Analyzed:	Jun 5, 1991	Jun 5, 1991	Jun 5, 1991	Jun 5, 1991
QC Sample #:	GBLK060591	GBLK060591	GBLK060591	GBLK060591

Sample Conc.:	N.D.	N.D.	N.D.	N.D.
---------------	------	------	------	------

Spike Conc. Added:	100	100	100	300
--------------------	-----	-----	-----	-----

Conc. Matrix Spike:	94	94	94	290
---------------------	----	----	----	-----

Matrix Spike % Recovery:	94	94	94	97
--------------------------	----	----	----	----

Conc. Matrix Spike Dup.:	98	98	98	290
--------------------------	----	----	----	-----

Matrix Spike Duplicate % Recovery:	98	98	98	97
------------------------------------	----	----	----	----

Relative % Difference:	4.2	4.2	4.2	0
------------------------	-----	-----	-----	---

SEQUOIA ANALYTICAL

VMTague
Vickie Tague
Project Manager

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

1060373.GET <2>



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: #3809.01, Unocal, San Lorenzo

Q C Sample Group: 106-0374

Reported: Jun 18, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	S. Hoffmann	S. Hoffmann	S. Hoffmann	S. Hoffmann
Reporting Units:	ng	ng	ng	ng
Date Analyzed:	Jun 7, 1991	Jun 7, 1991	Jun 7, 1991	Jun 7, 1991
QC Sample #:	BLK060791	BLK060791	BLK060791	BLK060791
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	100	100	100	300
Conc. Matrix Spike:	100	100	100	300
Matrix Spike % Recovery:	100	100	100	100
Conc. Matrix Spike Dup.:	100	99	99	300
Matrix Spike Duplicate % Recovery:	100	99	99	100
Relative % Difference:	0	1.0	1.0	0

SEQUOIA ANALYTICAL

V. Tague
Vickie Tague
Project Manager

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



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: #3809.01, Unocal, San Lorenzo

Q C Sample Group: 106-0375

Reported: Jun 18, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl Benzene	Xylenes
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Analyst:	S. Hoffmann	S. Hoffmann	S. Hoffmann	S. Hoffmann
Reporting Units:	ng	ng	ng	ng
Date Analyzed:	Jun 6, 1991	Jun 6, 1991	Jun 6, 1991	Jun 6, 1991
QC Sample #:	GBLK060691	GBLK060691	GBLK060691	GBLK060691
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	100	100	100	300
Conc. Matrix Spike:	96	96	99	290
Matrix Spike % Recovery:	96	96	99	97
Conc. Matrix Spike Dup.:	100	100	100	300
Matrix Spike Duplicate % Recovery:	100	100	100	100
Relative % Difference:	4.1	4.1	1.0	3.4

SEQUOIA ANALYTICAL

V. Tague
Vickie Tague
Project Manager

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

