GeoStrategies Inc. 93 AUG 16 PM 12:49

August 9, 1993

Alameda County Health Agency
Division of Hazardous Materials
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94521

Attention: Ms. Pamela Evans

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

Ms. Evans:

As requested by Ms. Tina Berry of UNOCAL Corporation, we are forwarding a copy of the Well Installation Report dated August 9, 1993 for the above referenced location. This report presents the results of field activities and second quarter 1993 groundwater monitoring and sampling.

If you have questions or comments, please call.

GeoStrategies Inc. by,

Cliff M. Garratt
Project Manager

Enclosure

cc: Ms. Tina Berry, UNOCAL Corporation
Mr. Richard Hiett, Regional Water Quality Control Board

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GeoStrategies Inc.

WELL INSTALLATION REPORT

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

780907-15

August 9, 1993

GeoStrategies Inc.

August 9, 1993

UNOCAL Corporation
Post Office Box 5155
San Ramon, California 94583

Attn: Ms. Tina Berry

Re: **WELL INSTALLATION REPORT**
UNOCAL Service Station No. 5760
376 Lewelling Boulevard
San Lorenzo, California

Ms. Berry:

This Well Installation Report has been prepared by GeoStrategies Inc. (GSI) for the above referenced site.

If you have any questions or comments, please call.

Sincerely,

Ellen C. Fostersmith
Geologist

REGISTERED GEOLOGIST
STEPHEN J. CARTER
No. 5577
STATE OF CALIFORNIA

Stephen J. Carter
Project Manager
RG 5577

ECF/SJC:rt

QC Review: CMG

780907-15

2140 WEST WINTON AVENUE • HAYWARD, CALIFORNIA 94545 • (510) 352-4800
601 UNIVERSITY AVENUE • SUITE 150 • SACRAMENTO, CALIFORNIA 95825 • (916) 568-7500

1.0 EXECUTIVE SUMMARY

The results of the field activities and chemical analyses for the UNOCAL Service Station No. 5760 in San Lorenzo, California, are summarized below:

- On May 25, 1993 one exploratory soil boring was drilled, sampled at five foot intervals, and lithologically logged to a depth of 31.0 feet below ground surface (bgs). This boring was completed as groundwater monitoring well U-9.

- Selected soil samples were chemically 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. TPH-Gasoline and BTEX were not detected in these samples.

- Groundwater samples from Wells U-1 through U-9 were collected by Gettler-Ryan Inc. (G-R) on June 4, 1993. Groundwater samples were analyzed for TPH-Gasoline and BTEX.

- TPH-Gasoline and BTEX were not detected in groundwater samples collected from Wells U-2, U-4, U-5, U-7 or U-8. BTEX was not detected in U-9. TPH-Gasoline was detected in U-9. TPH-Gasoline and BTEX were detected in wells U-1, U-3 and U-6.

2.0 INTRODUCTION

This report has been prepared by GSI for UNOCAL Service Station No. 5760, located at the above referenced site (Plate 1). One exploratory soil boring was drilled on May 25, 1993, and completed as groundwater monitoring well U-9. The well location is shown on Plate 2. Groundwater samples for the second quarter of 1993 were collected on June 4, 1993 by G-R. The results of the field activities and chemical analyses are discussed in this report. Field work was performed to comply with current State of California Water Resources Control Board (SWRCB) guidelines. GSI Field Methods and Procedures were presented in the GSI Work Plan dated September 1, 1992.

2.1 Site History

The underground storage tanks were replaced at this site during November and December 1987. Well U-1 was installed by Woodward-Clyde Consultants in February 1988 in response to contamination observed during the underground tank replacement (Woodward-Clyde, 1988). Due to high concentrations of benzene (3,600 parts per billion (ppb)) detected in the well, GSI installed three groundwater monitoring wells (U-2 through U-4) in August, 1990 (GeoStrategies Inc., 1990). In March 1992, GSI installed four additional groundwater monitoring wells (U-5 through U-8) to further delineate the groundwater hydrocarbon plume (GeoStrategies Inc., 1992).

3.0 HYDROGEOLOGIC CONDITIONS AND SITE GEOLOGY

The site is located approximately 500 feet north of San Lorenzo Creek. Soils beneath the subject site are Holocene-age alluvial deposits consisting of unconsolidated moderately sorted permeable fine sand, silt, and clayey silt with a few thin beds of coarse sand (Helley and Lajoie, 1979).

Available data indicate that the subsurface lithology consists of interfingering units of clay, silt and sands to a depth of 25 feet. The aquifer zone consists of a fairly continuous sand layer of between 5 and 10 feet in thickness. Below this sand zone is a clay/silt rich zone approximately 5 to 10 feet in thickness. This clay zone may act locally as an aquitard.

Groundwater was first encountered at approximately 15 feet below the surface. The water-bearing zone appears to be unconfined.

4.0 SITE ACTIVITIES

4.1 Field Procedures

One exploratory soil boring (U-9) was drilled using a truck-mounted hollow-stem auger rig. Soil samples were collected at intervals of five to seven feet with a modified California split-spoon sampler fitted with pre-cleaned stainless steel liners. Soils were described and an exploratory boring log was prepared by a GSI geologist using the Unified Soil Classification System (ASTM D2488-84) and Munsell Soil Color Charts. The Exploratory Boring Log is presented in Appendix A.

Soil samples retained for chemical analyses were sealed on both ends with teflon and plastic end caps. Samples were then labeled and entered onto a Chain-of-Custody form, and transported in a cooler with blue ice to Western Environmental Science and Technology (WEST), a California State-certified environmental laboratory located in Davis, California.

Soil from each sampled interval was used to perform head-space analysis in the field to qualitatively screen for the presence of organic vapors. Head-space analysis involved transferring soil from the stainless steel liners into a clean jar and immediately covering the jar with aluminum foil, secured with a ring-type threaded lid. After approximately 20 minutes, the foil was pierced and the head-space within the jar was tested for organic vapor measured using an Organic Vapor Meter (OVM) photoionization detector. Head-space analyses are summarized on the Exploratory Boring Log.

4.2 Well Installation

The boring caved from 29.0 to 31.0 feet bgs. The bottom was sealed with bentonite chips from 29.0 to 28.0 feet bgs. Well U-9 was installed to a depth of 28.0 feet bgs. The well was constructed using 2-inch-diameter Schedule 40 PVC casing and 0.020-inch machine-slotted well screen. The well screen interval extends from 13.0 to 28.0 feet bgs.

Lonestar #2/12 graded sand was placed in the annular space around the well from the bottom of the screened interval to two feet above the top of the screen. A two-foot thick bentonite seal followed by a neat-cement grout seal was placed above the sand to just below grade. A water-proof locking well cap and lock were placed on the top of the well casing. A water-resistant vault box set in concrete was installed over the top of the well at ground level. Well construction details are presented with the exploratory boring log in Appendix A.

4.3 Soil and Groundwater Analyses

Soil and groundwater samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified), and BTEX according to EPA Method 8020. Soil samples were analyzed by WEST. Groundwater samples were analyzed by Anametrix Inc., a California State-certified analytical laboratory located in San Jose, California.

4.4 Soil Chemical Analytical Results

Soil samples were collected at 4.5 feet below grade (fbg) and 11.5 fbg and submitted for analyses to WEST. TPH-Gasoline and BTEX compounds were not detected in soil samples from well boring U-9. The soil analytical report and Chain-of-Custody Form are presented in Appendix C. These data are summarized in Table 1.

5.0 CURRENT QUARTER SAMPLING RESULTS

5.1 Groundwater Chemical Analytical Results

Groundwater samples were collected on June 4, 1993. TPH-Gasoline and BTEX were not detected in Wells U-2, U-4, U-5, U-7 and U-8. BTEX was not detected in U-9 and the compound detected as TPH-Gasoline consists of a discrete peak not indicative of standard Gasoline. TPH-Gasoline and BTEX were detected in Wells U-1, U-3 and U-6. The laboratory analytical report and Chain-of-Custody Form are included in Appendix D.

These data are summarized and included with the historical chemical analytical data presented in Table 3. A chemical isoconcentration map for benzene is presented on Plate 4. Groundwater sampling field methods are included in a previous GSI report dated May 19, 1992.

5.2 Potentiometric Data and Floating Product Measurements

Depth-to-water measurements were obtained in each monitoring well prior to groundwater sampling on June 4, 1993. Static groundwater levels were measured from the surveyed top of the well box and recorded to the nearest $\pm$0.01 foot. **Water-level elevations were referenced to Mean Sea Level (MSL)** and are presented in Table 2. Water-level data were used to construct a quarterly potentiometric map (Plate 3). Shallow groundwater flow during the second quarter of 1993 was to the southwest with an approximate hydraulic gradient of 0.003.

Each well was inspected for the presence of floating product. Floating product was not observed in the wells this quarter. **Floating product has not been observed since November, 1992.** Field data sheets are included in Appendix B.

6.0 DISCUSSION

The floating product historically seen in Well U-1 appears to have been removed from the site by bailing. The hydrocarbon plume appears to have been adequately delineated by the monitoring network. The hydrocarbon plume appears to be stable in its present configuration and it does not appear to be migrating.

7.0 RECOMMENDATION

Continue quarterly groundwater monitoring and sampling to assess dissolved hydrocarbon concentrations in the shallow groundwater. Analyze samples from well U-9 according to EPA Method 8020 or 602 to evaluate probable source of the discrete hydrocarbon peak in the gasoline range.

LIST OF ATTACHMENTS

REFERENCES

GeoStrategies Inc., 1990, *Well Installation Report*; Report No. 7809-3, dated November 16, 1990.

GeoStrategies Inc., 1992, *Well Installation Report*; Report No. 7809-10, dated June 15, 1992.

Helley, E.J. and others, 1979, *Flatland Deposits of the San Francisco Bay Region, California - Their Geology and Engineering Properties, and Their Importance to Comprehensive Planning*; U.S. Geological Survey Professional Paper 943.

Woodward-Clyde Consultants, 1988, *Well Installation Report*; Report No. 8820011A-0015, dated March 25, 1988.

TABLE 1

SOIL ANALYSES DATA

WELL I.D.	SAMPLE DATE	ANALYZED DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)
U-9 (4.5)	25-May-93	28-May-93	<.50	<.0050	<.0050	<.0050	<.0050
U-9 (11.5)	25-May-93	28-May-93	<.50	<.0050	<.0050	<.0050	<.0050

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline.
PPM = Parts Per Million.

Notes:
1. All data shown as <x are reported as ND (none detected).
2. The number in ( ) corresponds to the depth below grade.

780907-15

TABLE 2

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	TEMP (F)	CONDUCTIVITY (uMHOS/cm)
U-1	04-Jun-93	3	30.5	40.51	16.72	---	23.79	5	7.20	68.9	1031
U-2	04-Jun-93	3	30.0	41.62	17.59	---	24.03	5	7.50	66.2	665
U-3	04-Jun-93	3	25.0	39.64	15.48	---	24.16	5	7.13	70.2	1999
U-4	04-Jun-93	3	28.0	40.53	16.73	---	23.80	5	7.12	70.2	1390
U-5	04-Jun-93	2	29.5	39.61	16.05	---	23.56	5	7.35	69.8	1192
U-6	04-Jun-93	2	30.0	37.94	14.45	---	23.49	5	7.11	68.5	980
U-7	04-Jun-93	2	34.5	37.49	14.17	---	23.32	5	7.31	66.0	887
U-8	04-Jun-93	2	35.0	38.94	15.26	---	23.68	5	7.29	66.6	877
U-9	04-Jun-93	2	28.7	37.88	14.67	---	23.21	5	7.18	67.8	1133

Notes: 1. Static water elevations referenced to Mean Sea Level (MSL).
2. Physical parameter measurements represent stabilized values.

TABLE 3

HISTORICAL GROUNDWATER 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.
05-Dec-90	U-1	Floating Product 0.10 ft				
04-Mar-91	U-1	Floating Product 0.05 ft				
03-Jun-91	U-1	Floating Product 0.06 ft				
19-Sep-91	U-1	Floating Product 0.04 ft				
04-Dec-91	U-1	Floating Product 0.36 ft				
05-Mar-92	U-1	Floating Product 0.02 ft				
07-Apr-92	U-1	**				
06-Aug-92	U-1	Floating Product 0.01 ft				
20-Nov-92	U-1	Floating Product 0.02 ft				
12-Feb-93	U-1	70000	2200	8400	3100	18000
04-Jun-93	U-1	**35000**	**1300**	**5700**	**900**	**9200**
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
04-Dec-91	U-2	<30	<0.30	<0.30	<0.30	<0.30
05-Mar-92	U-2	<30	<0.30	0.36	<0.30	<0.30
07-Apr-92	U-2	<50	<0.5	<0.5	<0.5	<0.5
06-Aug-92	U-2	<50	<0.5	<0.5	<0.5	<0.5
20-Nov-92	U-2	<50	<0.5	<0.5	<0.5	<0.5
12-Feb-93	U-2	<50	<0.5	<0.5	<0.5	<0.5
04-Jun-93	U-2	<50	<0.5	<0.5	<0.5	<0.5
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
04-Dec-91	U-3	75000	2500	6100	1900	11000

TABLE 3

HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
05-Mar-92	U-3	160000	5300	15000	5400	26000
07-Apr-92	U-3	97000	6100	16000	5400	28000
06-Aug-92	U-3	140,000	5,100	13,000	5,000	23,000
20-Nov-92	U-3	50000	3200	4700	1900	10000
12-Feb-93	U-3	80000	3700	9400	3700	18000
04-Jun-93	U-3	92000	2900	8700	4300	20000
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
04-Dec-91	U-4	<30	<0.30	<0.30	<0.30	<0.30
05-Mar-92	U-4	<30	<0.30	<0.30	<0.30	<0.30
07-Apr-92	U-4	<50	<0.5	<0.5	<0.5	<0.5
06-Aug-92	U-4	<50	<0.5	<0.5	<0.5	<0.5
20-Nov-92	U-4	<50	<0.5	2.5	<0.5	<0.5
12-Feb-93	U-4	<50	<0.5	<0.5	<0.5	<0.5
04-Jun-93	U-4	<50	<0.5	<0.5	<0.5	<0.5
07-Apr-92	U-5	<50	<0.5	<0.5	<0.5	<0.5
06-Aug-92	U-5	<50	<0.5	<0.5	<0.5	<0.5
20-Nov-92	U-5	<50	<0.5	<0.5	<0.5	<0.5
12-Feb-93	U-5	<50	<0.5	<0.5	<0.5	<0.5
04-Jun-93	U-5	<50	<0.5	<0.5	<0.5	<0.5
07-Apr-92	U-6	6600	90	<0.5	820	1200
06-Aug-92	U-6	9200	160	<0.5	360	150
20-Nov-92	U-6	NA				
12-Feb-93	U-6	2600	27	<0.5	120	51
04-Jun-93	U-6	13000	100	38	450	320
07-Apr-92	U-7	<50	<0.5	<0.5	<0.5	<0.5
06-Aug-92	U-7	<50	<0.5	<0.5	<0.5	<0.5
20-Nov-92	U-7	<50	<0.5	<0.5	<0.5	<0.5
12-Feb-93	U-7	<50	<0.5	<0.5	<0.5	<0.5
04-Jun-93	U-7	<50	<0.5	<0.5	<0.5	<0.5

TABLE 3

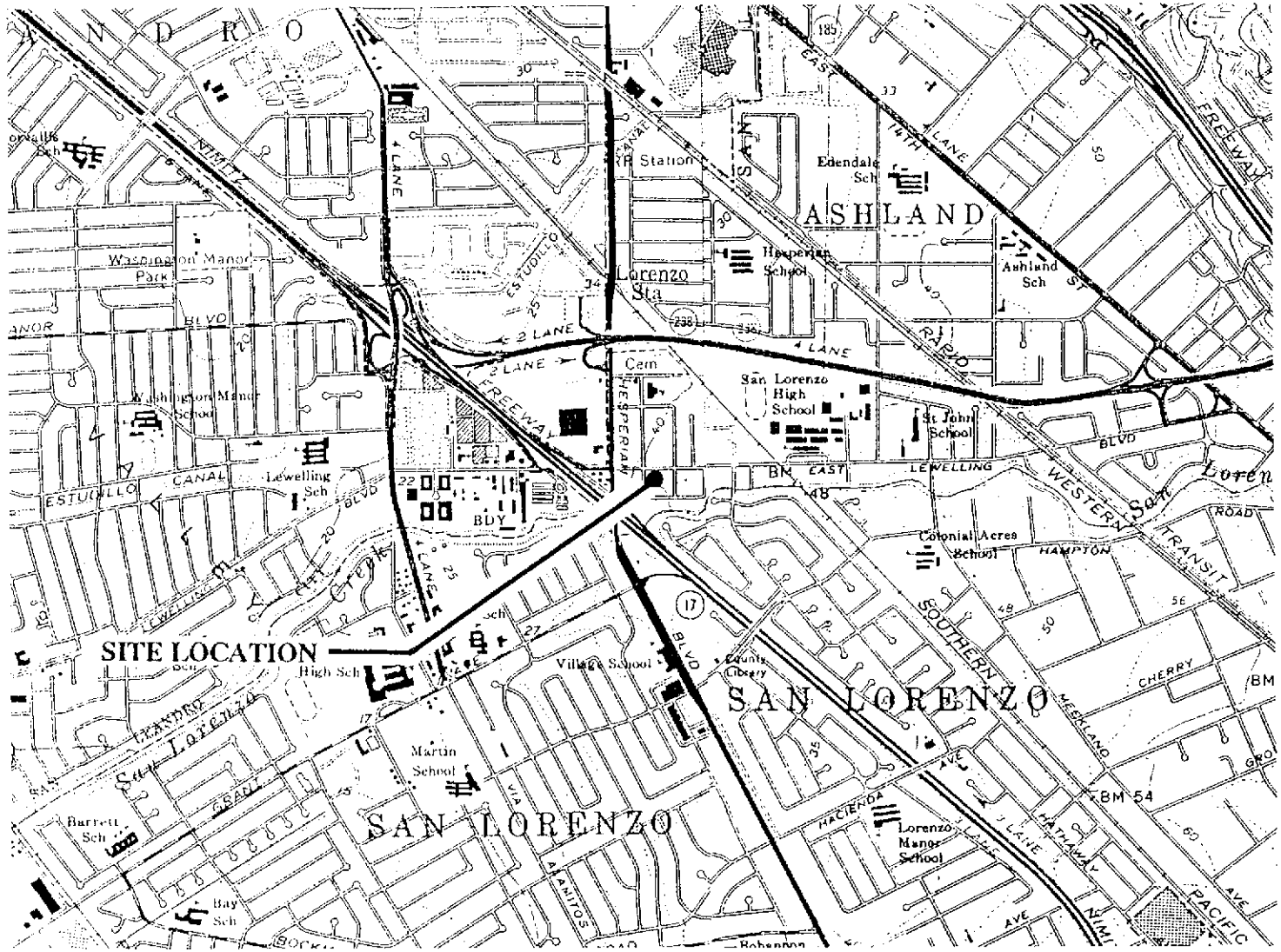
HISTORICAL GROUNDWATER QUALITY DATABASE

SAMPLE DATE	SAMPLE POINT	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)
07-Apr-92	U-8	<50	<0.5	<0.5	<0.5	<0.5
06-Aug-92	U-8	<50	<0.5	<0.5	<0.5	<0.5
12-Feb-93	U-8	<50	<0.5	<0.5	<0.5	<0.5
04-Jun-93	U-8	<50	<0.5	<0.5	<0.5	<0.5
04-Jun-93	U-9	2100+	<2.5	<2.5	<2.5	<2.5

TPH-G = Total Petroleum Hydrocarbons calculated as Gasoline
PPB = Parts Per Billion
N/A = Not Accessible

** = Product Skimmer installed in well
\+ = The concentration reported as gasoline is primarily due to the presence of a discrete hydrocarbon peak not indicative of standard gasoline.

Notes:
1. All data shown as <x are reported as ND (none detected).
2. Ethylbenzene and xylenes were combined prior to March 1990.
3. Laboratory values are reported in units of ug/L, which generally are synonymous with parts per billion (ppb).



Base Map: USGS Topographic Map

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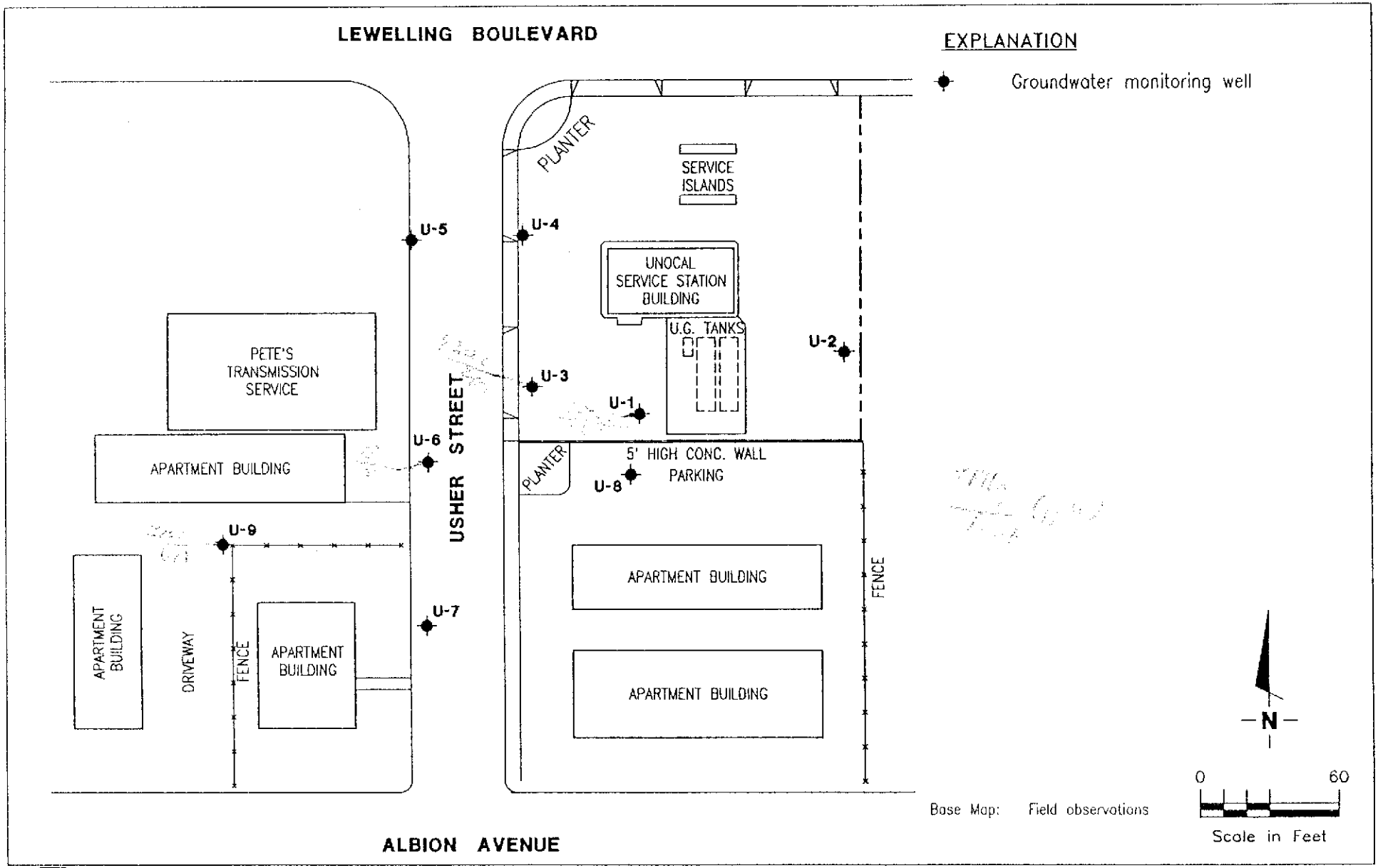
VICINITY MAP
UNOCAL Service Station #5760
376 Lewelling Boulevard
San Lorenzo, California

PLATE
1

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7809		2/91	

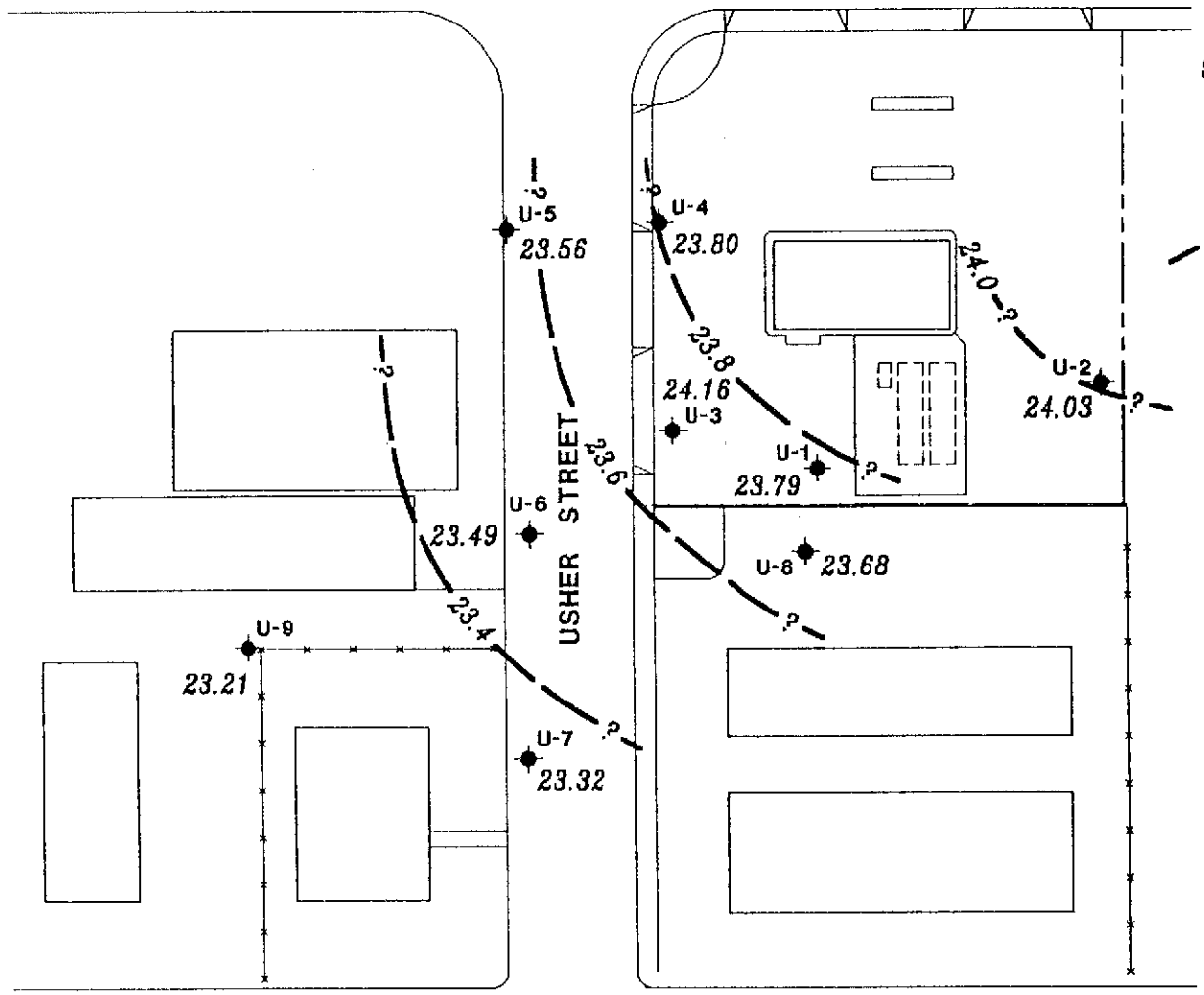


GeoStrategies Inc.

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

PLATE 2

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
7809		7/93	



EXPLANATION

- Groundwater monitoring well
- 99.99 Groundwater elevation in feet referenced to Mean Sea Level (MSL) measured on June 4, 1993
- 99.99 Groundwater elevation contour. Approximate Gradient = 0.003

NOTES:
1. Contours may be influenced by irrigation practices and/or site construction activities.
2. U-3 appeared anomalous and was not used in contouring.

Approximate Groundwater Flow Direction

N

0 60

Scale in Feet

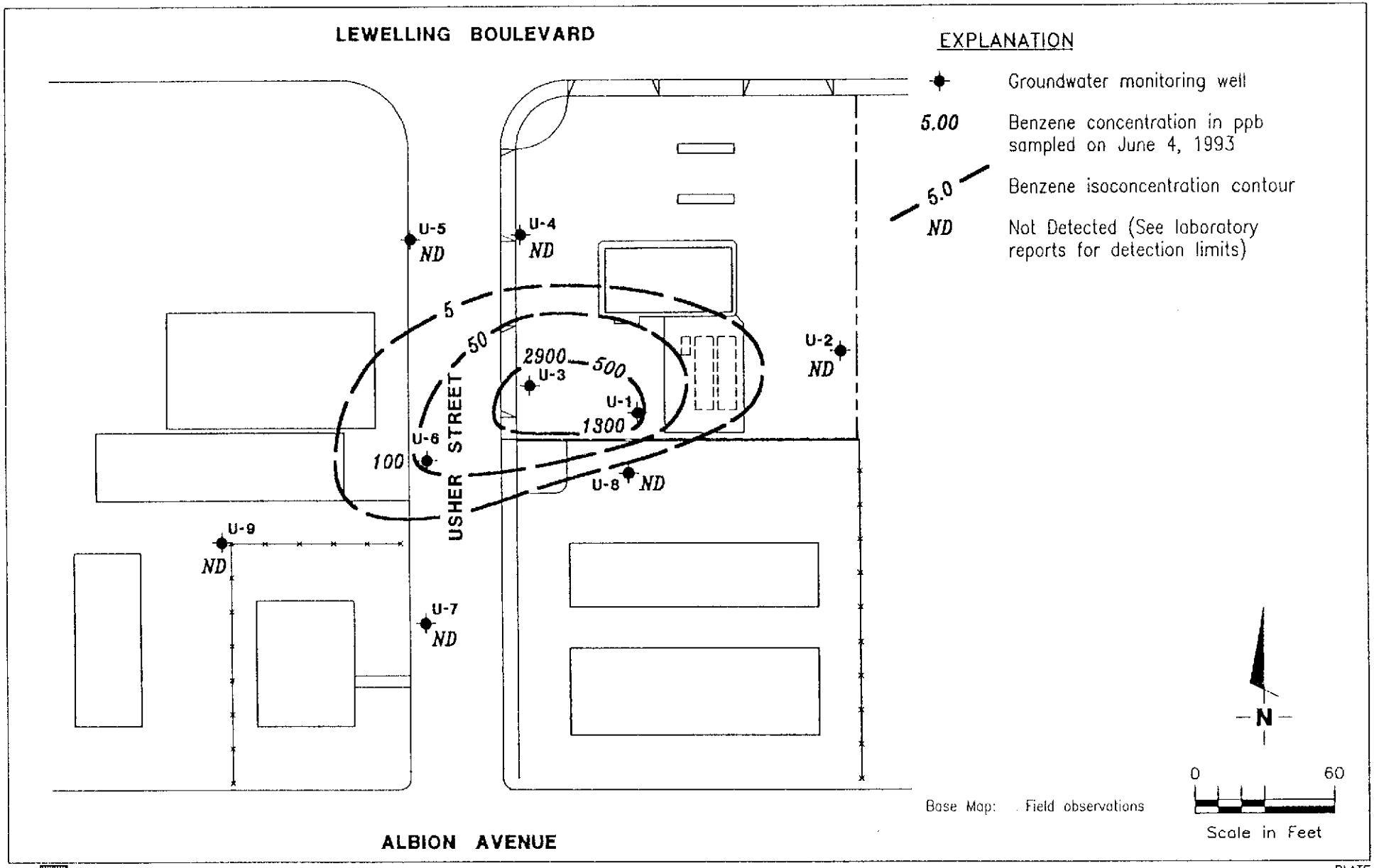
Base Map: Field observations

GeoStrategies Inc.

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

PLATE 3

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
780907-15		7/93	



GeoStrategies Inc.

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

PLATE
4

JOB NUMBER	REVIEWED BY	DATE	REVISED DATE
780907-15		7/93	

APPENDIX A
EXPLORATORY BORING LOGS
AND
WELL CONSTRUCTION DETAILS

MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
			GP		POORLY GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
		GRAVELS WITH OVER 15% FINES	GM		SILTY GRAVELS, SILTY GRAVELS WITH SAND
			GC		CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
			SP		POORLY GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
		SANDS WITH OVER 15% FINES	SM		SILTY SANDS WITH OR WITHOUT GRAVEL
			SC		CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTS WITH SANDS AND GRAVELS
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY CLAYS WITH SANDS AND GRAVELS, LEAN CLAYS
			OL		ORGANIC SILTS OR CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS, FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC SILTS OR CLAYS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS			PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

LL	- Liquid Limit (%)
PI	- Plastic Index (%)
PID	- Volatile Vapors in ppm
MA	- Particle Size Analysis
2.5 YR 6/2	- Soil Color according to Munsell Soil Color Charts (1975 Edition)
5 GY 5/2	- GSA Rock Color Chart

☒	- No Soil Sample Recovered
■	- "Undisturbed" Sample
⊠	- Bulk or Classification Sample
▽	- First Encountered Ground Water Level
▼	- Piezometric Ground Water Level
Penetration	- Sample drive hammer weight - 140 pounds falling 30 inches. Blows required to drive sampler 1 foot are indicated on the logs

GeoStrategies Inc.

Unified Soil Classification - ASTM D 2488-85
and Key to Test Data

Field location of boring: (See Plate 2)	Project No.: 780907 Date: 5/25/93	Boring No: U-9	
	Client: UNOCAL Service Station #5760		
	Location: 376 Lewelling Boulevard		
	City: San Lorenzo, California	Sheet 1 of 2	
	Logged by: ECF Driller: W. Hazmat		
Drilling method: Hollow Stem Auger	Casing installation data:		
Hole diameter: 8 inches	Top of Box Elevation:	Datum:	

Water Level	15.0	14.5	
Time	09:30	17:45	
Date	5/25/93	5/25/93	

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
				1				PAVEMENT SECTION - 8 inches
								SILTY SAND (SM) - dark brown (7.5YR 3/2); loose, moist; 85% fine sand, 15% silt.
				2				
				3				
	>200	Push	U-9	4				Paper debris at 4.0 ft.
			4.5					SAND WITH SILT (SP-SM) - light olive brown (2.5Y 5/4); medium dense, moist; 90% medium sand, 10% silt, trace gravel.
				5				
				6				
				7				
				8				
				9				
				10				SILT WITH SAND (ML) - dark grayish brown (10YR 4/2); stiff, moist; 80% silt, 20% fine sand, trace coarse sand; medium plasticity.
		S&H						
			U-9	11				
0	10		11.5					
				12				
				13				
				14				
				15		▽		Saturated at 15.0 ft.
		S&H	U-9					
0.2	10		16.0	16				
				17				
				18				
				19				
				20				

Remarks:

* Converted to equivalent Standard Penetration blows/ft.

GeoStrategies Inc.

Log of Boring

BORING NO. U-9

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
780907	RG 5574	5/93		

Field location of boring:

(See Plate 2)

Project No.:	780907	Date: 5/25/93	Boring No: U-9
Client:	UNOCAL Service Station #5760		
Location:	376 Lewelling Boulevard		
City:	San Lorenzo, California		Sheet 2 of 2
Logged by:	ECF	Driller: W. Hazmat	

Drilling method: Hollow Stem Auger

Hole diameter: 8 Inches

Casing installation data:

Top of Box Elevation: Datum:

Water Level								
Time								
Date								

PID (ppm)	Blows/ft.* or Pressure (psi)	Type of Sample	Sample Number	Depth (ft.)	Sample	Well Detail	Soil Group Symbol (USCS)	Description
		S&H						
			U-9	21				SAND (SP) - light olive brown (2.5Y 5/4); loose, saturated; 80% coarse sand, 10% fine sand, 5% gravel.
2.1	9		21.5					
				23				
				24				
				25				CLAY (CL) - light yellowish brown (2.5Y 6/4); hard, saturated; 95% clay, 5% coarse sand ; medium plasticity.
		S&H	U-9					
0.5	36		26.0	26				
				27				
				28				
				29				
				30				Consistency decreasing to very stiff at 30.0 ft.; trace gravel.
		S&H	U-9					
0	26		31.0	31				
				32				
				33				Bottom of boring at 31.0 ft. 5/25/93
				34				
				35				
				36				
				37				
				38				
				39				
				40				

Remarks:

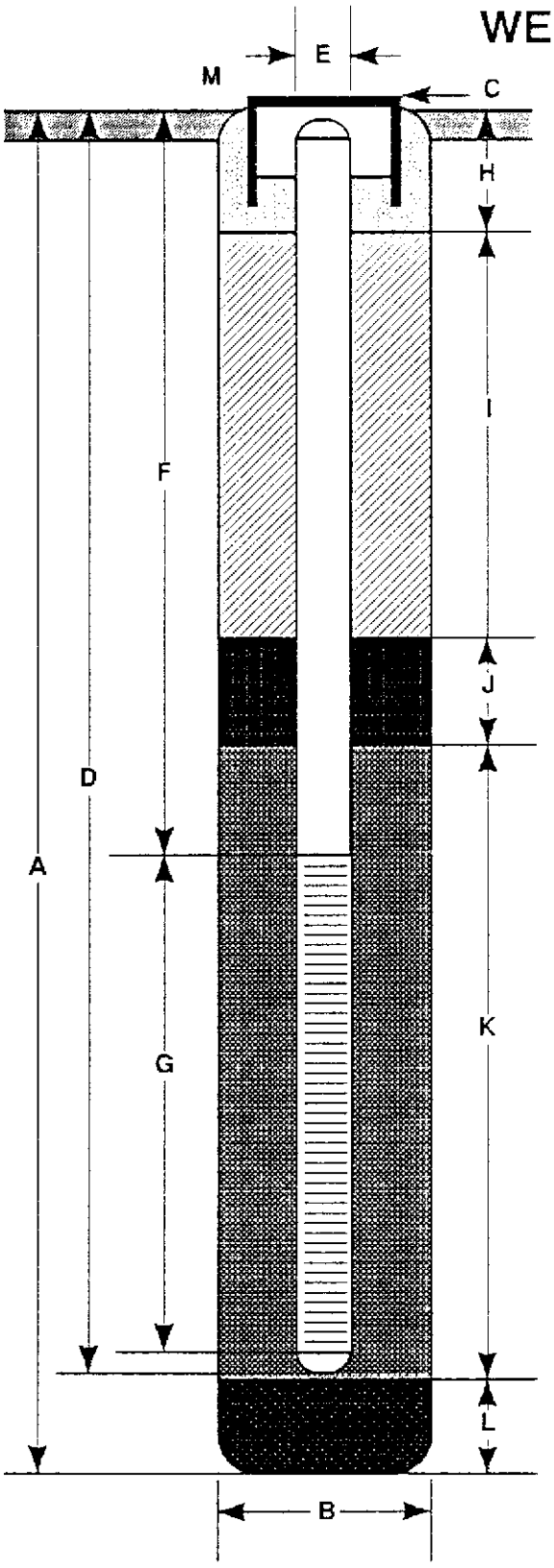
GeoStrategies Inc.

Log of Boring

BORING NO. U-9

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
780907	RG 5577	5/93		

WELL CONSTRUCTION DETAIL



A Total Depth of Boring 31.0 ft.

B Diameter of Boring 8 in.
Drilling Method Hollow Stem Auger

C Top of Box Elevation 37.88 ft.
[X] Referenced to Mean Sea Level
[ ] Referenced to Project Datum

D Casing Length 28 ft.
Material Schedule 40 PVC

E Casing Diameter 2 in.

F Depth to Top Perforations 13.0 ft.

G Perforated Length 15.0 ft.
Perforated Interval from 13.0 to 28.0 ft.
Perforation Type Machine Slotted
Perforation Size 0.020 in.

H Surface Seal from 0 to 1.5 ft.
Seal Material Concrete

I Backfill from 1.5 to 9.0 ft.
Backfill Material Cement

J Seal from 9.0 to 11.0 ft.
Seal Material Bentonite

K Gravel Pack from 11.0 to 28.0 ft.
Pack Material Lonestar 2/12

L Bottom Seal Sluff 31.0-29.0 ft
Seal Material Bentonite 29.0-28.0 ft.

M Water-resistant vault box, locking waterproof well cap and lock.

Note: Depths measured from initial ground surface.

GeoStrategies Inc.

Well Construction Detail

WELL NO.
U-9

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
780907	SJC RG 5577	5/93		

APPENDIX B
FIELD DATA SHEETS

GETTLER-RYAN INC.

General and Environmental Contractors

OBSERVATION WELL
DAILY MONITOR RECORD

COMPANY Unocal #5766 JOB # 9809.80

LOCATION 376 Lewelling DATE 6-4-93

CITY San Lorenzo CA TIME

WELL	DEPTH TO LIQUID (DTH) OR (DTW)	HYDROCARBON THICKNESS (HT) BEFORE	HYDROCARBON THICKNESS (HT) AFTER	AMOUNT PUMPED	COMMENTS
U-1	16.72		~~28.7~~ 30.5	TP 6/7/93	
U-2	17.59		30.0		
U-3	15.48		25.0		
U-4	16.73		28.0		
U-5	16.05		30.0		
U-6	14.45		30.0		
U-7	14.17		~~34.7~~ 34.5	TP 6/7/93	
U-8	15.26		35.0		
U-9	14.07		28.7		

Measured to Ground Surface - 70B

PRODUCT TANK: TOTAL: FLOWMETER:

WATER: OTHER:

COMMENTS:

BETTERLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING
FIELD DATA SHEET

COMPANY Unocal # 5760 JOB # 9809.80

LOCATION 376 Lewelling Blvd DATE 6-4-93

CITY San Lorenzo CA TIME

Well ID. U-2 Well Condition Okay

Well Diameter (3") 2" in. Hydrocarbon Thickness — ft.

Total Depth 30.0 ft.

Depth to Liquid- 17.59 ft.

Volume Factor (VF)	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 12.41 x(VF) (0.38) 0.17 = (Estimated Purge Volume) 4.724 gal.

Purging Equipment Suction

Sampling Equipment Bailer

Starting Time 13:00 Purging Flow Rate 2.5 gpm.

(Estimated Purge Volume) ____ gal. / (Purging Flow Rate) ____ gpm. = (Anticipated Purging Time) ____ min.

Time	pH	Conductivity	Temperature	Volume
13:02	7.78	745	19.0	5
13:04	7.64	690	19.0	10
13:06	7.58	672	19.0	15
13:08	7.44	665	19.0	20
13:10	7.50	665	19.0	25

Did well dewater? N/A If yes, time ____ Volume ____

Sampling Time 13:15 Weather Conditions ____

Analysis Gas BTXE Bottles Used ____

Chain of Custody Number ____

COMMENTS ____

FOREMAN F. Cline ASSISTANT

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING
FIELD DATA SHEET

COMPANY Unocal # 5760 JOB # 9809.80

LOCATION 376 Lewelling Blvd DATE 6-4-93

CITY San Lorenzo CA. TIME

Well ID. U-3 Well Condition okay

Well Diameter (3") 2" in. Hydrocarbon Thickness — ft.

Total Depth 35' ft.

Depth to Liquid- 15.48 ft.

Volume Factor (VF)	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 9.52 x(VF) (0.38) 0.17 = (Estimated Purge Volume) 36.18 gal.

Purging Equipment Suction

Sampling Equipment Bailer

Starting Time 12:42 Purging Flow Rate 2.0 gpm.

(Estimated Purge Volume) ____ gal. / (Purging Flow Rate) ____ gpm. = (Anticipated Purging Time) ____ min.

Time	pH	Conductivity	Temperature	Volume
12:44	7.11	1250	21.8	4
12:46	7.03	1249	21.5	8
12:48	7.11	1211	21.2	12
12:50	7.14	1201	21.2	16
12:52	7.13	1999	21.2	20

Did well dewater? No If yes, time ____ Volume ____

Sampling Time 12:55 Weather Conditions ____

Analysis Gas BTXE Bottles Used ____

Chain of Custody Number ____

COMMENTS ____

PERSONNEL E. Clint

SETTLER-RYAN INC.
General and Environmental Contractors

WELL SAMPLING
FIELD DATA SHEET

COMPANY Unocal # 5760 JOB # 9809.80
LOCATION 376 Lewelling Blvd DATE 6-4-93
CITY San Lorenzo CA TIME

Well ID. W-4
Well Diameter (3") 4" in.
Total Depth 28.0 ft
Depth to Liquid- 16.73 ft

Well Condition
Hydrocarbon Thickness ft

Volume Factor (VF)	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 11.27 x(VF) 0.38 0.17 = (Estimated Purge Volume) 4.3 2/ gal.

Purging Equipment Suction
Sampling Equipment Bailer

Starting Time 12:21 Purging Flow Rate 2.2 gpm.
(Estimated Purge Volume) gal. / (Purging Flow Rate) gpm. = (Anticipated Purging Time) min.

Time	pH	Conductivity	Temperature	Volume
12:23	7.37	1378	21.0	4.4
12:25	7.08	1407	21.2	8.8
12:27	7.13	1399	21.2	13.2
12:29	7.11	1389	21.2	17.6
12:31	7.12	1390	21.0	22.0

Did well dewater? NC If yes, time Volume
Sampling Time 12:35 Weather Conditions
Analysis Gas BTXE Bottles Used
Chain of Custody Number

COMMENTS

FOREMAN E. Cline

GETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING
FIELD DATA SHEET

COMPANY Unocal # 5760 JOB # 9809.80

LOCATION 376 Lewelling Blvd DATE 6-4-93

CITY San Lorenzo CA. TIME

Well ID. U-5

Well Condition okay

Well Diameter 3" (2") in.

Hydrocarbon Thickness — ft.

Total Depth 29.5 ft.

Depth to Liquid- 16.05 ft.

Volume Factor (VF)	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 13.95 x(VF) 0.38 0.17 = (Estimated Purge Volume) 2.4 12 gal.

Purging Equipment Suction

Sampling Equipment Bailer

Starting Time 12:04 Purging Flow Rate 1/2 gpm.

(Estimated Purge Volume) ____ gal. / (Purging Flow Rate) ____ gpm. = (Anticipated Purging Time) ____ min.

Time	pH	Conductivity	Temperature	Volume
12:06	7.67	1200	20.6	2.4
12:08	7.51	1151	21.0	4.8
12:10	7.41	1182	21.1	7.2
12:12	7.31	1192	21.0	9.6
12:14	7.35	1192	21.0	12.0

Did well dewater? No If yes, time ____ Volume ____

Sampling Time 12:18 Weather Conditions ____

Analysis Gas BTXE Bottles Used ____

Chain of Custody Number ____

COMMENTS ____

ECI

GETTLER-RYAN INC.
General and Environmental Contractors

WELL SAMPLING
FIELD DATA SHEET

COMPANY Unocal # 5760 JOB # 9809.80
LOCATION 376 Lewelling Blvd DATE 6-4-93
CITY San Lorenzo CA. TIME

Well ID. U-6
Well Condition okay
Well Diameter 3" (2") in.
Hydrocarbon Thickness ft.
Total Depth 30 ~~29.15~~ ft.
Depth to Liquid- 14.45 ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 15.55 x(VF) 0.38 (0.17) = (Estimated Purge Volume) 2.6 /3 gal.

Purging Equipment Suction
Sampling Equipment Bailer

Starting Time 11:46 Purging Flow Rate 1/2 gpm.
(Estimated Purge Volume) gal. / (Purging Flow Rate) gpm. = (Anticipated Purging Time) min.

Time	pH	Conductivity	Temperature	Volume
11:48	7.16	958	20.5	3
11:50	7.14	981	20.3	6
11:52	7.08	980	20.3	9
11:54	7.11	979	20.4	12
11:56	7.11	980	20.3	15

Did well dewater? No If yes, time Volume
Sampling Time 12:00 Weather Conditions
Analysis Gas BTXE Bottles Used
Chain of Custody Number

COMMENTS

PERSON E. Cline

SETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY Unocal # 5760 JOB # 9809.80

LOCATION 376 Lewelling Blvd DATE 6-4-93

CITY San Lorenzo CA. TIME

Well ID. U-7 Well Condition okay

Well Diameter 3" (2") in. Hydrocarbon Thickness — ft.

Total Depth 34.5 ft.

Volume Factor (VF)	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

Depth to Liquid- 14.17 ft.

(# of casing volumes) 5 x 20.33 x(VF) 0.38 0.17 = (Estimated Purge Volume) 8.46 17.3 gal.

Purging Equipment Suction

Sampling Equipment Bailer

Starting Time 11:28 Purging Flow Rate 18 gpm.

(Estimated Purge Volume) ____ gal. / (Purging Flow Rate) ____ gpm. = (Anticipated Purging Time) ____ min.

Time	pH	Conductivity	Temperature	Volume
11:30	7.15	894	18.6	3.6
11:32	7.45	890	18.9	7.2
11:34	7.31	886	18.8	10.8
11:36	7.33	886	18.8	14.4
11:38	7.31	887	18.9	~~18.0~~ 18.0

Did well dewater? No If yes, time ____ Volume ____

Sampling Time 11:43 Weather Conditions ____

Analysis Gas BTXE Bottles Used ____

Chain of Custody Number ____

COMMENTS ____

FOREMAN E. Cline ASSISTANT ____

SETTLER-RYAN INC.

General and Environmental Contractors

WELL SAMPLING
FIELD DATA SHEET

COMPANY Unocal # 5760 JOB # 9809.80

LOCATION 376 Lewelling Blvd DATE 6-4-93

CITY San Lorenzo CA. TIME

Well ID. U-8 Well Condition okay

Well Diameter 3" (2") in. Hydrocarbon Thickness ft.

Total Depth 35.0 ft.

Volume Factor (VF)	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

Depth to Liquid- 15.26 ft.

(# of casing volumes) 5 x 19.74 x(VF) 0.38 (0.17) = (Estimated Purge Volume) 33 17 gal.

Purging Equipment Suction

Sampling Equipment Bailer

Starting Time 13:18 Purging Flow Rate ~~1.5~~ 2.0 gpm.

(Estimated Purge Volume) gal. / (Purging Flow Rate) gpm. = (Anticipated Purging Time) min.

Time	pH	Conductivity	Temperature	Volume
13:20	7.33	855	19.2	4
13:22	7.32	870	19.2	6
13:24	7.29	870	19.2	8
13:26	7.29	876	19.3	12
13:28	9.29	877	19.2	16

Did well dewater? No If yes, time Volume

Sampling Time 13:32 Weather Conditions

Analysis Gas BTXE Bottles Used

Chain of Custody Number

COMMENTS

FOREMAN Fl Cline

GETTLER-RYAN INC.
General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY Unocal # 5760 JOB # 9809.80

LOCATION 376 Lewelling Blvd DATE 6-4-93

CITY San Lorenzo CA. TIME

Well ID. U-9 Well Condition

Well Diameter 3" (2") in. Hydrocarbon Thickness ft.

Total Depth 28.7 ft.

Depth to Liquid- 14.12 (0.55) ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.80	
	4" = 0.66	10" = 4.10	

(# of casing volumes) 5 x 14.58 x(VF) 0.38 0.17 = (Estimated Purge Volume) 2.5 1.25 gal.

Purging Equipment Suction

Sampling Equipment Bailer

Starting Time 11:03 Purging Flow Rate 1.5 gpm.

(Estimated Purge Volume) gal. / (Purging Flow Rate) gpm. = (Anticipated Purging Time) min.

Time	pH	Conductivity	Temperature	Volume
11:05	7.29	1203	19.7	3
11:07	7.22	1156	19.8	6
11:09	7.19	1131	20.0	9
11:11	7.18	1131	19.9	12
11:13	7.18	1133	19.9	15

Did well dewater? If yes, time Volume

Sampling Time 11:15 Weather Conditions

Analysis Gas BTXE Bottles Used

Chain of Custody Number

COMMENTS

FOREMAN F. Cline ASSISTANT

APPENDIX C
SOIL LABORATORY ANALYTICAL REPORT
AND
CHAIN-OF-CUSTODY FORM

June 2, 1993
Sample Log 6523

Penny Silzer
Geostrategies, Inc.
2150 W Winton Ave.
Hayward, CA 94545

Subject: Analytical Results for 2 Soil Samples
Identified as: 780907
Received: 05/25/93

Dear Ms. Silzer:

Analysis of the sample(s) referenced above has been completed. This report is written to confirm results communicated on June 2, 1993 and describes procedures used to analyze the samples.

The sample(s) were received in:

Stainless steel sleeves with end caps.

Each sample was transported and received under documented chain of custody, assigned a consecutive log number and stored at 4 degrees Celsius until analysis commenced.

Sample(s) were analyzed using the following method(s):

"BTEX" (EPA Method 8020/Purge-and-Trap)
"TPH as Gasoline" (Modified EPA Method 8015/Purge-and-Trap)

Please refer to the following table(s) for summarized analytical results and contact us at 916-757-4650 if you have questions regarding procedures or results. The chain-of-custody document is enclosed.

Approved by:

Joel Kiff
Senior Chemist

809-A

Sample Log 6523

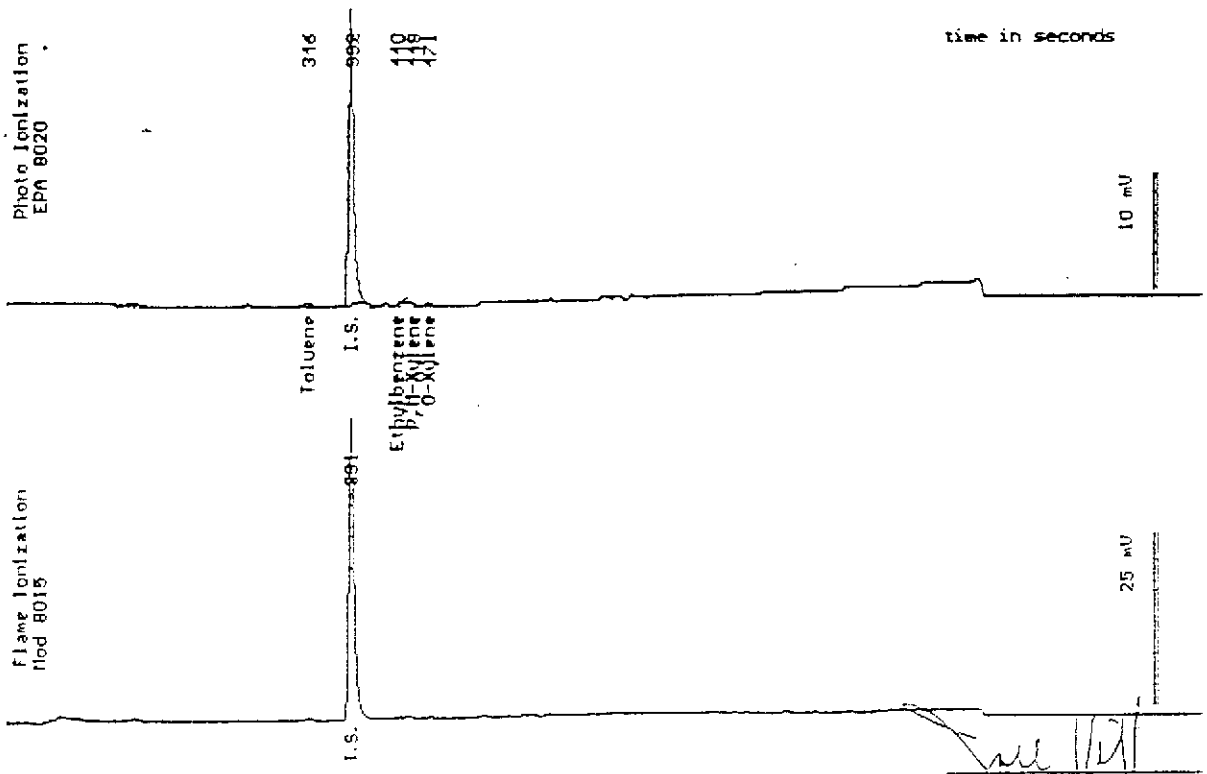
6523-1

Sample: U9-4.5

From : 780907
Sampled : 05/25/93
Dilution : 1:1
Matrix : Soil

QC Batch : 6023a

Parameter	(MDL) ug/kg	Measured Value ug/kg
Benzene	(.0050)	<.0050
Toluene	(.0050)	<.0050
Ethylbenzene	(.0050)	<.0050
Total Xylenes	(.0050)	<.0050
TPH as Gasoline	(.50)	<.50



Date Analyzed: 05-26-93
Column : 0.53mm ID X 30m DB5 (J&W Scientific)

Joel Kiff
Senior Chemist

Sample Log 6523

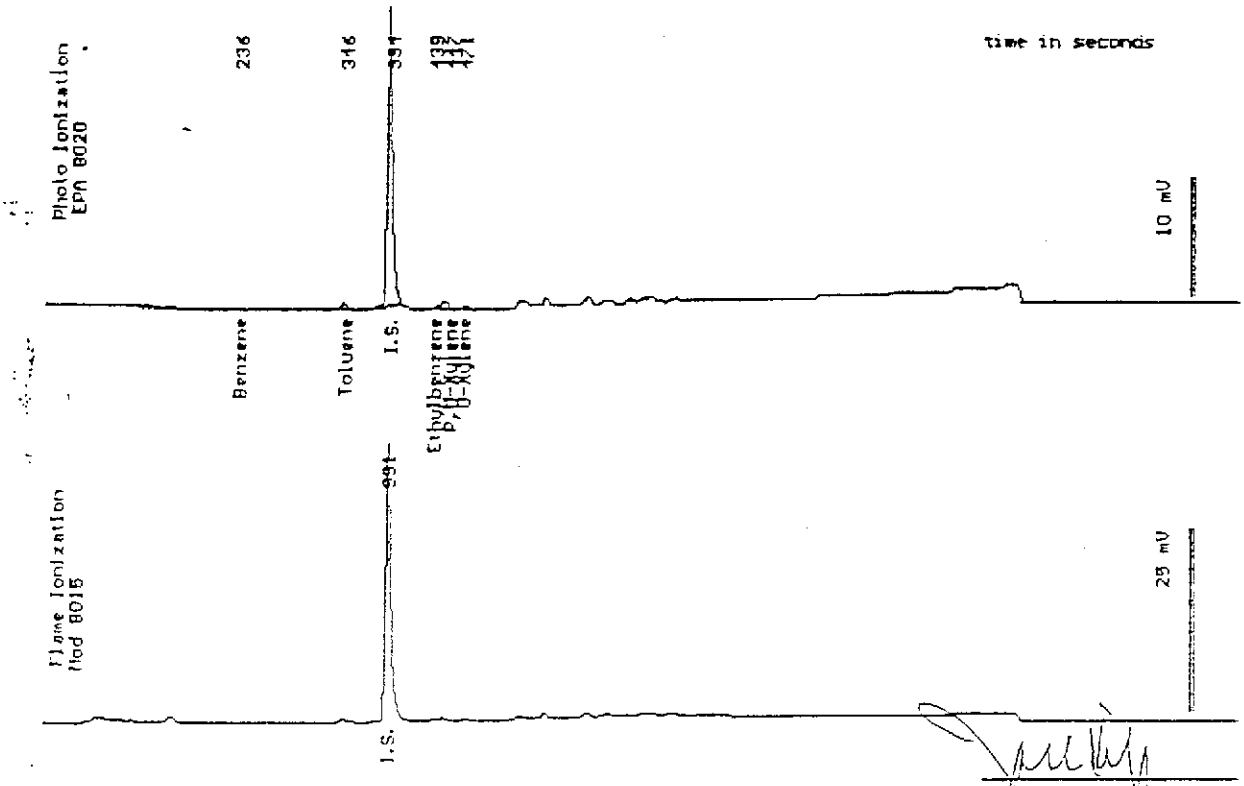
6523-2

Sample: U9-11.5

From : 780907
Sampled : 05/25/93
Dilution : 1:1
Matrix : Soil

QC Batch : 6023a

Parameter	(MDL) ug/kg	Measured Value ug/kg
Benzene	(.0050)	<.0050
Toluene	(.0050)	<.0050
Ethylbenzene	(.0050)	<.0050
Total Xylenes	(.0050)	<.0050
TPH as Gasoline	(.50)	<.50



Date Analyzed: 05-26-93
Column : 0.53mm ID X 30m DB5 (J&W Scientific)

Joel Kiff
Senior Chemist

Gettler - Ryan Inc. — ENVIRONMENTAL DIVISION — 2068 Chain of Custo

COMPANY Unocal Corporation — JOB NO 780907

JOB LOCATION 376 Lewelling Blvd

CITY San Lorenzo — PHONE NO

AUTHORIZED M.S. Penny 5/25 — DATE 5-5-93 — P.O. NO

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
U9-4.5	1	Soil	5/25	TPH-Gas, BTEX	
U9-11.5	1	Soil	5/25	" "	

RELINQUISHED BY: Ellen Fostin 5/25/93 1400

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY:

RELINQUISHED BY:

RECEIVED BY LAB: 5/25/93 1400

DESIGNATED LABORATORY: West

DHS #:

REMARKS: Normal T.A.T (1wk)

RECEIVED by W.E.S.T. date 5-5-93

DATE COMPLETED

FOREMAN

APPENDIX D

GROUNDWATER ANALYTICAL REPORT

AND

CHAIN-OF-CUSTODY FORM

Inchcape Testing Services
Anametrix Laboratories

1961 Concourse Drive #E
San Jose, CA 95131
Tel 408-432-8192
Fax 408-432-8198

MR. TOM PAULSON
GETTLER RYAN/GEOSTRATEGIES
2150 W. WINTON AVENUE
HAYWARD, CA 94545

Workorder # : 9306072
Date Received : 06/04/93
Project ID : 9809.80
Purchase Order: 9809.80

The following samples were received at Anametrix, Inc. for analysis :

ANAMETRIX ID	CLIENT SAMPLE ID
9306072- 1	U-1
9306072- 2	U-2
9306072- 3	U-3
9306072- 4	U-4
9306072- 5	U-5
9306072- 6	U-6
9306072- 7	U-7
9306072- 8	U-8
9306072- 9	U-9
9306072-10	TB

This report consists of 8 pages not including the cover letter, and is organized in sections according to the specific Anametrix laboratory group or section which performed the analysis(es) and generated the data. The Report Summary that precedes each section will help you determine which Anametrix group is responsible for those test results, and will bear the signatures of the department supervisor and the chemist who have reviewed the analytical data. Please refer all questions to the department supervisor who signed the form.

Anametrix is certified by the California Department of Health Services (DHS) to perform environmental testing under Certificate Number 1234. A detailed list of the approved fields of testing can be obtained by calling our office, or the DHS Environmental Laboratory Accreditation Program at (415)540-2800.

If you have any further questions or comments on this report, please give us a call as soon as possible. Thank you for using Anametrix.

Catherine Ham for
Sarah Schoen, Ph.D.
Laboratory Director

06/17/93
Date

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MR. TOM PAULSON
GETTLER RYAN/GEOSTRATEGIES
2150 W. WINTON AVENUE
HAYWARD, CA 94545

WorkOrder # : 9306072
Date Received : 06/04/93
Project ID : 9809.80
Purchase Order: 9809.80
Department : GC
Sub-Department: TPH

SAMPLE INFORMATION:

ANAMETRIX SAMPLE ID	CLIENT SAMPLE ID	MATRIX	DATE SAMPLED	METHOD
9306072- 1	U-1	WATER	06/04/93	TPHgBTEX
9306072- 2	U-2	WATER	06/04/93	TPHgBTEX
9306072- 3	U-3	WATER	06/04/93	TPHgBTEX
9306072- 4	U-4	WATER	06/04/93	TPHgBTEX
9306072- 5	U-5	WATER	06/04/93	TPHgBTEX
9306072- 6	U-6	WATER	06/04/93	TPHgBTEX
9306072- 7	U-7	WATER	06/04/93	TPHgBTEX
9306072- 8	U-8	WATER	06/04/93	TPHgBTEX
9306072- 9	U-9	WATER	06/04/93	TPHgBTEX
9306072-10	TB	WATER	06/04/93	TPHgBTEX

REPORT SUMMARY
ANAMETRIX, INC. (408)432-8192

MR. TOM PAULSON
GETTLER RYAN/GEOSTRATEGIES
2150 W. WINTON AVENUE
HAYWARD, CA 94545

WorkOrder # : 9306072
Date Received : 06/04/93
Project ID : 9809.80
Purchase Order: 9809.80
Department : GC
Sub-Department: TPH

QA/QC SUMMARY :

- The concentration reported as gasoline for sample U-9 is primarily due to the presence of a discrete hydrocarbon peak not indicative of gasoline.

Cheryl Balmer 6/17/93
Department Supervisor Date

P R Patel 06117193
Chemist Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS
(GASOLINE WITH BTEX)
ANAMETRIX, INC. - (408) 432-8192

Anametrix W.O.: 9306072 Project Number : 9809.80
Matrix : WATER Date Released : 06/17/93
Date Sampled : 06/04/93

	Reporting Limit	Sample I.D.# U-1	Sample I.D.# U-2	Sample I.D.# U-3	Sample I.D.# U-4	Sample I.D.# U-5
COMPOUNDS	(ug/L)	-01	-02	-03	-04	-05
Benzene	0.5	1300	ND	2900	ND	ND
Toluene	0.5	5700	ND	8700	ND	ND
Ethylbenzene	0.5	900	ND	4300	ND	ND
Total Xylenes	0.5	9200	ND	20000	ND	ND
TPH as Gasoline	50	35000	ND	92000	ND	ND
% Surrogate Recovery		71%	86%	72%	87%	85%
Instrument I.D.		HP4	HP4	HP4	HP4	HP4
Date Analyzed		06/12/93	06/12/93	06/12/93	06/12/93	06/12/93
RLMF		250	1	500	1	1

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using modified EPA Method 8015 following sample purge and trap by EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020 following sample purge and trap by EPA Method 5030.
RLMF - Reporting Limit Multiplication Factor.

Anametrix control limits for surrogate p-Bromofluorobenzene recovery are 61-139%

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

P R Patel 06/17/93
Analyst Date

Cheryl Bolsom 6/17/93
Supervisor Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS
(GASOLINE WITH BTEX)
ANAMETRIX, INC. - (408) 432-8192

Anametrix W.O.: 9306072 Project Number : 9809.80
Matrix : WATER Date Released : 06/17/93
Date Sampled : 06/04/93

	Reporting Limit	Sample I.D.# U-6	Sample I.D.# U-7	Sample I.D.# U-8	Sample I.D.# U-9	Sample I.D.# TB
COMPOUNDS	(ug/L)	-06	-07	-08	-09	-10
Benzene	0.5	100	ND	ND	ND	ND
Toluene	0.5	38	ND	ND	ND	ND
Ethylbenzene	0.5	450	ND	ND	ND	ND
Total Xylenes	0.5	320	ND	ND	ND	ND
TPH as Gasoline	50	13000	ND	ND	2100	ND
% Surrogate Recovery		69%	88%	90%	93%	84%
Instrument I.D.		HP4	HP4	HP4	HP4	HP4
Date Analyzed		06/12/93	06/12/93	06/12/93	06/14/93	06/12/93
RLMF		10	1	1	5	1

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using modified EPA Method 8015 following sample purge and trap by EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020 following sample purge and trap by EPA Method 5030.
RLMF - Reporting Limit Multiplication Factor.

Anametrix control limits for surrogate p-Bromofluorobenzene recovery are 61-139%

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

Analyst 06/17/93 Date

Supervisor 6/17/93 Date

ANALYSIS DATA SHEET - TOTAL PETROLEUM HYDROCARBONS
(GASOLINE WITH BTEX)
ANAMETRIX, INC. - (408) 432-8192

Anametrix W.O.: 9306072 Project Number : 9809.80
Matrix : WATER Date Released : 06/17/93
Date Sampled : N/A

COMPOUNDS	Reporting Limit (ug/L)	Sample I.D.# BU1201E2 BLANK	Sample I.D.# BU1401E2 BLANK
Benzene	0.5	ND	ND
Toluene	0.5	ND	ND
Ethylbenzene	0.5	ND	ND
Total Xylenes	0.5	ND	ND
TPH as Gasoline	50	ND	ND
% Surrogate Recovery		89%	88%
Instrument I.D.		HP4	HP4
Date Analyzed		06/12/93	06/14/93
RLMF		1	1

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using modified EPA Method 8015 following sample purge and trap by EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA Method 8020 following sample purge and trap by EPA Method 5030.
RLMF - Reporting Limit Multiplication Factor.

Anametrix control limits for surrogate p-Bromofluorobenzene recovery are 61-139%

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ARPate 06/17/93
Analyst Date

Chauncey Salmon 6/17/93
Supervisor Date

TOTAL VOLATILE HYDROCARBON MATRIX SPIKE REPORT
EPA METHOD 5030 WITH GC/FID
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 9809.80 U-7	Anametrix I.D.	: 06072-07
Matrix	: WATER	Analyst	: WP
Date Sampled	: 06/04/93	Supervisor	:
Date Analyzed	: 06/12/93	Date Released	: 06/17/93
		Instrument ID	: HP4

COMPOUND	SPIKE AMT (ug/L)	SAMPLE AMT (ug/L)	REC MS (ug/L)	% REC MS	REC MD (ug/L)	% REC MD	RPD	% REC LIMITS
GASOLINE	500	0	490	98%	460	92%	-6%	48-149
P-BFB				64%		62%		61-139

* Limits established by Anametrix, Inc.

TOTAL VOLATILE HYDROCARBON LABORATORY CONTROL SAMPLE REPORT
EPA METHOD 5030 WITH GC/FID
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: LAB CONTROL SAMPLE	Anametrix I.D.	: LCSW0612
Matrix	: WATER	Analyst	: AP
Date Sampled	: N/A	Supervisor	: CB
Date Analyzed	: 06/12/93	Date Released	: 06/17/93
		Instrument I.D.	: HP4

COMPOUND	SPIKE AMT. (ug/L)	REC LCS (ug/L)	%REC LCS	% REC LIMITS
GASOLINE	500	450	90%	67-127
SURROGATE			61%	61-139

* Quality control established by Anametrix, Inc.

BTEX LABORATORY CONTROL SAMPLE REPORT
EPA METHOD 5030 WITH GC/PID
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: LAB CONTROL SAMPLE	Anametrix I.D.	: LCSW0614
Matrix	: WATER	Analyst	: AP
Date Sampled	: N/A	Supervisor	: CB
Date Analyzed	: 06/14/93	Date Released	: 06/17/93
		Instrument ID	: HP4

COMPOUND	SPIKE AMT. (ug/L)	LCS (ug/L)	REC LCS	%REC LIMITS
Benzene	20.0	21.0	105%	52-133
Toluene	20.0	22.0	110%	57-136
Ethylbenzene	20.0	22.5	113%	56-139
TOTAL Xylenes	20.0	22.8	114%	56-141
P-BFB			96%	61-139

* Limits established by Anametrix, Inc.

Gettler - Ryan Inc. — 9306072 (18) — 5210 Chain of Custo

ENVIRONMENTAL DIVISION

COMPANY Unocal 5760 JOB NO

JOB LOCATION 376 Lewelling Blvd

CITY San Lorenzo CA PHONE NO.

AUTHORIZED Tom Paulson / Cliff Garrett DATE 6-4-93 P.O. NO. 9809.80

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
U-1	3	Liquid	6-4-93 / 13:55	THC (Gas) BTXE	(1)
U-2			/ 13:15		(2)
U-3			/ 12:55		(3)
U-4			/ 12:35		(4)
U-5			/ 12:18		(5)
U-6			/ 12:00		(6)
U-7			/ 11:43		(7)
U-8			/ 13:32		(8)
U-9			/ 11:25		(9)
TB	2		/		(10)

RELINQUISHED BY: [signature] 6-4-93 16:25 RECEIVED BY:

RELINQUISHED BY: RECEIVED BY:

RELINQUISHED BY: RECEIVED BY LAB: 6/4/93 16:

DESIGNATED LABORATORY: Anametrix DHS #:

REMARKS: Normal TAT

DATE COMPLETED 6-4-93 FOREMAN F. Cline