ENVIRONMENTAL CONSULTING & MANAGEMENT
ROUX ASSOCIATES

1855 GATEWAY BOULEVARD
SUITE 770
CONCORD, CALIFORNIA 510 602-2333 FAX# 510 687-1258

STID 1126

Transmittal/Memorandum

To: Ms. Jennifer Eberle
Alameda County Health Agency
80 Swan Way, Room 350
Oakland, CA 94621

From: Paul Supple PS

Date: June 18, 1992

Subject: Soil Sampling Report
UNOCAL Service Station No. 1871
96 MacArthur Boulevard, Oakland, California 94610

Job No.: 27001W

Remarks: Enclosed is one copy of the subject report for your file.

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cc: Mr. Robert Boust, UNOCAL

SOIL SAMPLING BELOW REMOVED FUEL DISPENSERS

UNOCAL Service Station No. 1871
96 MacArthur Boulevard
Oakland, California 94610

June 18, 1992

STID 1130

Prepared for:

UNOCAL
2000 Crow Canyon Place, Suite 400
San Ramon, California

Prepared by:

ROUX ASSOCIATES
1855 Gateway Boulevard, Suite 770
Concord, California 94520
(510) 602-2333

Doc #UL27001W.1.2

TITLE: Soil Sampling Below Removed Fuel Dispensers
UNOCAL Service Station No. 1871
96 MacArthur Boulevard
Oakland, California

DATE: June 18, 1992

PROJECT NO: 27001W

SUBMITTED BY: Roux Associates
1855 Gateway Boulevard, Suite 770
Concord, California 94520

This work was done under the direction of the undersigned California Registered Geologist.

PREPARED BY:

Paul Supple
Senior Hydrogeologist

Dean A. Richesin
Certified Engineering Geologist No. 1055

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1.0 INTRODUCTION

This report describes soil sampling procedures and presents the soil sampling analytical data for UNOCAL Service Station No. 1871 located at 96 MacArthur Boulevard, Oakland, California (Site). Two former pump islands at the Site were demolished and two new pump islands were constructed in their place. UNOCAL authorized Roux Associates (Roux) under Purchase Order/Contract No. 3100001911 to collect and analyze soil samples and prepare this report. Soil samples were collected from beneath the removed fuel dispensers and from the excavated soil stockpiles. Sampling activities were conducted on May 13 and May 18, 1992.

The work performed by Roux was conducted by Roux field personnel under the direction of Mr. Dean A. Richesin, California Certified Engineering Geologist Number 1055.

2.0 SITE DESCRIPTION

UNOCAL Service Station No. 1871 is an operating auto repair and self-service gasoline station located at the northwest corner of the intersection of Harrison Street and MacArthur Boulevard in Oakland, California (Figure 1). The Site is an asphalt and concrete covered lot, at an elevation of about 80 feet above mean sea level (USGS, 1980). Topography in the Site area slopes (approximately 10 percent) toward the southwest.

Two pump islands, four fuel dispensers and associated underground piping were demolished and removed. Two new pump islands were reconstructed in about the same locations as the former pump islands. Currently, Site features include a service station building, two newly constructed pump islands, one 280-gallon waste oil UST located west of the building, and two 12,000-gallon gasoline USTs located in a common tank cavity in the center of the Site.

3.0 GEOLOGY AND HYDROGEOLOGY

The Site is located at the eastern margin of the San Francisco Bay Region known as the East Bay Plain (Figure 1). The East Bay Plain is characterized by broad alluvial fans and alluvial plains which slope westward into the San Francisco Bay. The Site is within the Oakland Alluvial Plain, a local ground water sub-area (Hickenbottom, 1988). A San Francisco Bay tidal estuary, Lake Merritt, is located about 1 mile south of the Site. The underlying geology has been mapped as older alluvium which consists of layers of poorly consolidated to unconsolidated clay, silt, sand and gravel (Hickenbottom, 1988). The Site is located approximately 2 miles west of the active Hayward Fault (Helley, et al, 1979).

Soil encountered in shallow excavations completed at the Site during pump island removal and reconstruction activities consisted of reddish brown plastic clay and artificial fill. The artificial fill is made up primarily of loose, medium to coarse-grained sand, with abundant large fragments of asphalt, brick, wood and other debris. Artificial fill was encountered from the ground surface to a depth of about 8 feet below ground surface (bgs) at the pump island nearer Harrison Street, and from ground surface to a depth of about 1.5 feet bgs at the pump island nearer MacArthur Boulevard. Clay was encountered below the artificial fill at the pump island near MacArthur Boulevard.

Ground water was not encountered in any of the shallow excavations. The deepest of the excavations was completed to a maximum depth of 8 feet bgs. The estimated direction of ground water flow at the Site is to the southwest, based on the local topography, drainage and regional flow considerations.

4.0 PUMP ISLAND REMOVAL AND SOIL SAMPLING

Dan Brenton Construction (Brenton) of San Jose, California, began work to remove the old pump islands on May 11, 1992. The fuel dispensers were removed and the concrete pump islands were demolished. The fill overlying the underground piping was removed and stockpiled on-site.

Removal of underground piping and sampling of the soil beneath the removed fuel dispensers took place on May 13, 1992. The uncovered piping was inspected by Ms. Jennifer Eberle of the Alameda County Department of Environmental Health (ACDEH) and Roux. All piping appeared to be in good condition. **There was no visible evidence of holes or cracks in the piping.** Brenton then removed the underground piping. Roux collected four soil samples from beneath the removed fuel dispensers at locations selected by Ms. Jennifer Eberle of the ACDEH (Figure 3). Samples were collected at depths of 2 to 5 feet bgs.

Soil samples were collected in a stainless steel drive sampler lined with a 2-inch diameter, 4-inch long brass sampling tube. The sampler was attached to the end of steel rods which were attached to a slide hammer. A backhoe was used to remove soil to the desired sampling depth, and the sampler was then driven into the bottom of the excavation by hammering the free end of the steel rods with the slide hammer. The sampler was then recovered and opened. The brass tube was removed, each end was covered with aluminum foil and a plastic cap, and then sealed with duct tape. The samples were labeled with the project name, time, date, sample designation, and sampler's initials and placed in a plastic bag. The samples were then stored on ice in a cooler chest until delivered to the laboratory. Chain-of-Custody documentation was maintained for all samples.

Laboratory analyses of soil sample D3 collected from below the removed fuel dispenser at the west end of the pump island near Harrison Street indicated concentrations of petroleum hydrocarbons above 10 mg/kg. Therefore, on May 18,

at 55 ppm

1992, Roux collected one additional soil sample below sample location D3. Sample D3-A was collected at a depth of 8 feet bgs. The sample was collected using a stainless steel drive sampler and prepared for transport to the laboratory in the same manner utilized when sampling below the removed fuel dispensers on May 13, 1992.

The five soil samples collected from beneath the removed fuel dispensers were delivered for chemical analyses to Sequoia Analytical (Sequoia) of Concord, California, a State certified laboratory. The samples were analyzed for the following:

- Total petroleum fuel hydrocarbons as low to medium boiling point hydrocarbons (TPH-G) by U.S. Environmental Protection Agency (USEPA) Method 8015.
- Benzene, toluene, ethylbenzene, and xylenes (BTEX) by USEPA Method 8020, and
- Total lead by USEPA Method 7421.

Table 1 summarizes the laboratory analytical data for the product line trench samples. Laboratory analytical reports are presented in Appendix A and Chain-of-Custody documentation forms are contained in Appendix B.

5.0 EXCAVATED SOIL STOCKPILING, SAMPLING AND DISPOSAL

5.1 Soil Stockpiling and Sampling

The fill material and native soil excavated during trenching at the Site were stockpiled on the north side of the lot (Figure 3). Composite samples were collected from the stockpile to characterize the soil for disposal.

On May 18, 1992, Roux collected four soil samples from the stockpiled soil. To prepare the soil for sampling, 6 to 12 inches of soil were scraped away from the surface of the stockpile. Samples were collected from the prepared surface. Stockpile samples were collected in brass tubes and prepared for transport to the laboratory in the same manner utilized when sampling below the fuel dispensers.

The stockpile samples were delivered to Sequoia for chemical analyses. Chain-of-Custody documentation was maintained for all samples. Sequoia combined the set of four stockpile samples into one composite sample for analysis. The composite sample was then analyzed for TPH-G by USEPA Method 8015, BTEX by USEPA Method 8020, and organic lead by the Department of Health Services (DHS) Method described in the California LUFT Manual, 12/87.

Laboratory analysis of the composite soil sample indicated TPH-G at a concentration of 32 mg/kg and BTEX concentrations ranging from 0.0056 to 0.25 mg/kg. Laboratory analytical reports are presented in Appendix A and Chain-of-Custody documentation forms are contained in Appendix B.

5.2 Disposal of Stockpiled Soil

Roux sent the laboratory analytical data for the soil stockpile to Dillard Trucking of Byron, California (Dillard). Dillard provided the laboratory analytical data for the

soil stockpile to the Redwood Landfill in Novato, California. Following approval from Redwood Landfill, the soil stockpile (approximately 18 cubic yards) was removed from the Site on June 5, 1992 by Dillard and transported to the Redwood Landfill facility for disposal. Soil disposal documentation is provided in Appendix C.

6.0 SUMMARY OF RESULTS

This section presents the results of pump island removal and reconstruction activities, soil disposal and soil sampling analytical data at the Site.

6.1 Pump Island Removal and Reconstruction

Two pump islands, four fuel dispensers and associated underground piping were demolished and removed. Two new pump islands were reconstructed in about the same locations as the former pump islands.

6.2 Disposal of Soil

Soil generated during pump island reconstruction activities was stockpiled on-site and sampled. Laboratory analysis of the soil stockpile sample indicated TPH-G at a concentration of 32 mg/kg and BTEX concentrations ranging from 0.0056 to 0.25 mg/kg. The soil stockpile was transported to the Redwood Landfill facility in Novato, California, for disposal.

6.3 Petroleum Hydrocarbons and Lead in Soil Below the Removed Fuel Dispensers

Laboratory analyses of soil samples collected from below the removed fuel dispensers at the pump island nearer to MacArthur Boulevard indicated non-detectable concentrations of TPH-G and BTEX. Total lead was detected at concentrations ranging from 2.4 to 2.6 mg/kg.

Laboratory analyses of soil samples collected from below the removed fuel dispensers at the pump island nearer to Harrison Street indicated TPH-G concentrations ranging from 2.9 to 1,700 mg/kg, and BTEX concentrations ranging from not detected to 11 mg/kg (Table 1). Soil sample D3-A, collected at 8 feet bgs, contained the highest concentrations of TPH-G and BTEX identified. Total lead was detected at concentrations ranging from 4.8 to 23 mg/kg.

7.0 PLANNED SITE INVESTIGATION

Following completion of the pump island reconstruction project, UNOCAL plans to investigate the extent of hydrocarbons at the Site. The investigation, at a minimum, will consist of the installation of three monitoring wells, and soil and ground water analysis. Based on the data collected during the Site investigation, an appropriate remedial program will be designed and implemented at the Site. A Work Plan describing the initial phase of the Site investigation will be submitted to the ACDEH by July 1, 1992.

8.0 REFERENCES

Helley, E.S., LaJoie, K.R., Spangle, W.E., and Blair M.L. 1979. Flatland Deposits of the San Francisco Bay Region, California. U.S. Geological Survey Professional Paper 943.

Hickenbottom, K. and Muir, K. 1988. Geohydrology and Ground Water Quality Overview, East Bay Plain Area, Alameda County, California 205(J) Report. Alameda County Flood Control and Water Conservation District, California.

U.S.G.S. 1980. Oakland West Quadrangle, California 1959; photo revised, 1980.

TABLE 1: Summary of Soil Analyses: Below Removed Fuel Dispensers
UNOCAL Service Station No. 1871, Oakland, California

Sample Designation	Date	Depth (feet bgs)	TPH-G (1)	BTEX Distinction (1) Benzene	Toluene	Ethylbenzene	Xylenes	Lead (1)
D1	5/13/92	2	ND	ND	ND	ND	ND	2.4
D2	5/13/92	2	ND	ND	ND	ND	ND	2.6
D3	5/13/92	4	58	0.20	0.087	0.52	0.97	23
D4	5/13/92	5	2.9	ND	ND	ND	0.0070	4.8
D3-A	5/18/92	8	1,700	3.1	1.0	11	5.4	18
Comp.	5-18		37	.015				ND

FOOTNOTES

(1) = Concentrations reported in mg/kg (ppm)

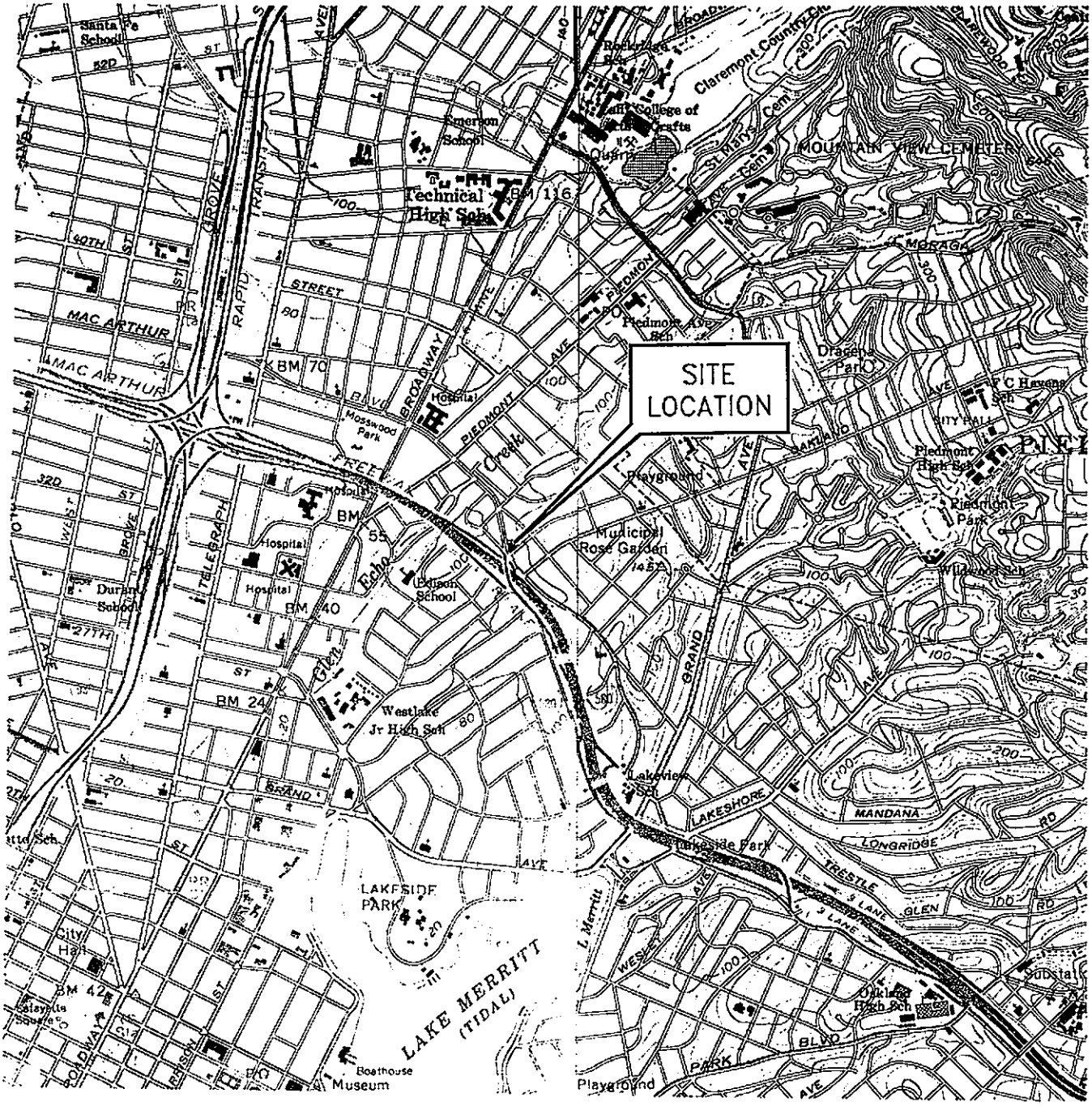
TPH-G = Total Petroleum Fuel Hydrocarbons As Low/Medium Boiling Point Hydrocarbons (USEPA Method 8015)

BTEX Distinction (USEPA Method 8020)

Lead = Total Lead (USEPA Method 7421)

ND = None Detected

bgs = Below ground surface



SOURCE:

USGS 7.5 MINUTE QUADRANGLES OF OAKLAND EAST, CALIFORNIA 1980, AND OAKLAND WEST, CALIFORNIA 1980.

ROUX ASSOCIATES, INC.
ENVIRONMENTAL CONSULTING & MANAGEMENT

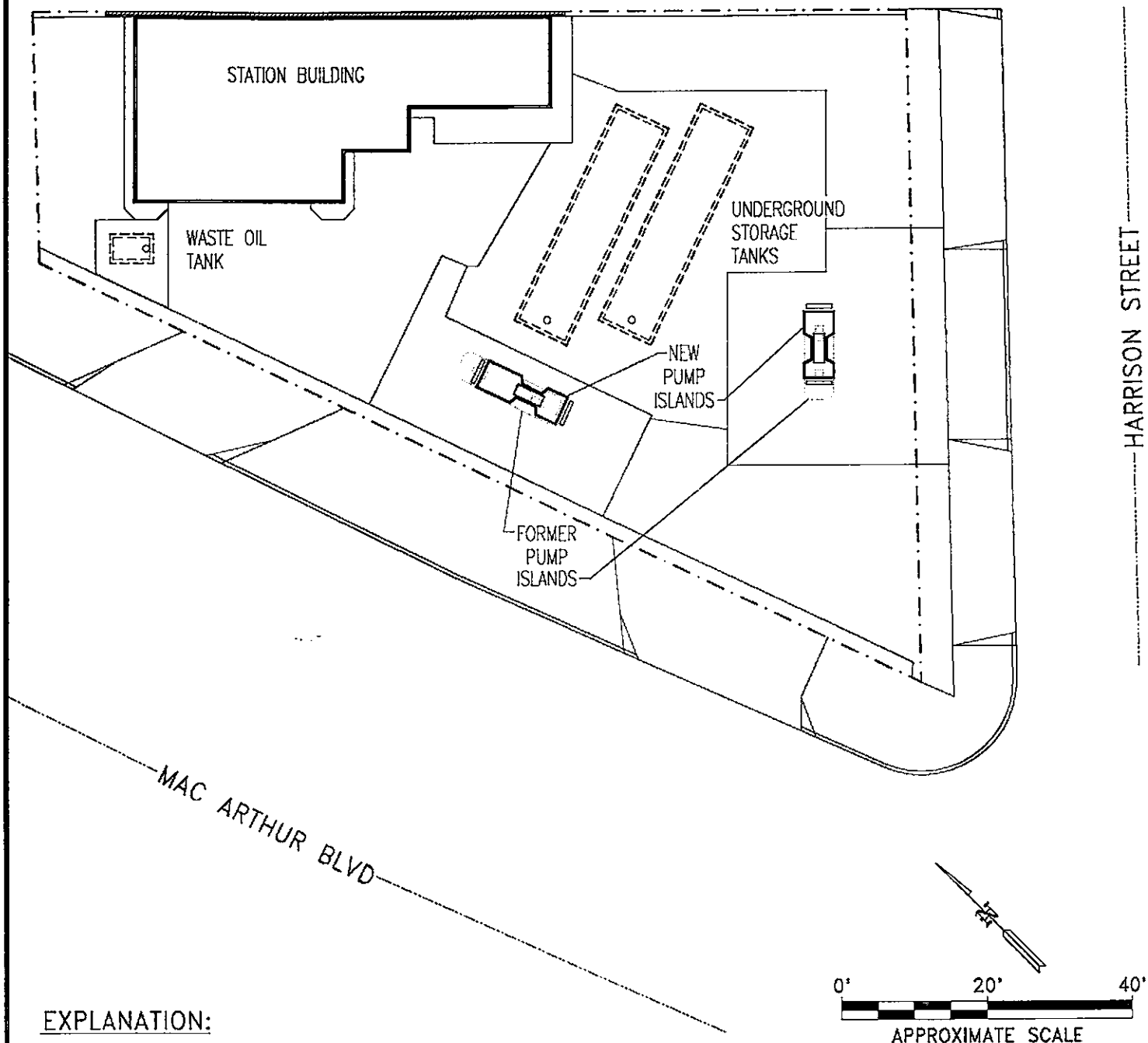
COMPILED BY:	P.S.
PREPARED BY:	R.P.
PROJECT MNGR.	P.S.
DATE:	05/92
SCALE:	AS SHOWN
PROJECT NO.	27001W
FILE NAME:	TOPO1871

PREPARED FOR: UNOCAL

TITLE: SITE LOCATION

UNOCAL FACILITY NO. 1871

FIGURE 1



EXPLANATION:

- UNDERGROUND STORAGE TANK
- PROPERTY BOUNDARY LINE
- FORMER PUMP ISLAND
- NEW PUMP ISLAND

SOURCE:

MAP MODIFIED FROM BLUEPRINT PROVIDED BY, UNOCAL 76, 04/92.

ROUX ASSOCIATES, INC.
ENVIRONMENTAL CONSULTING & MANAGEMENT

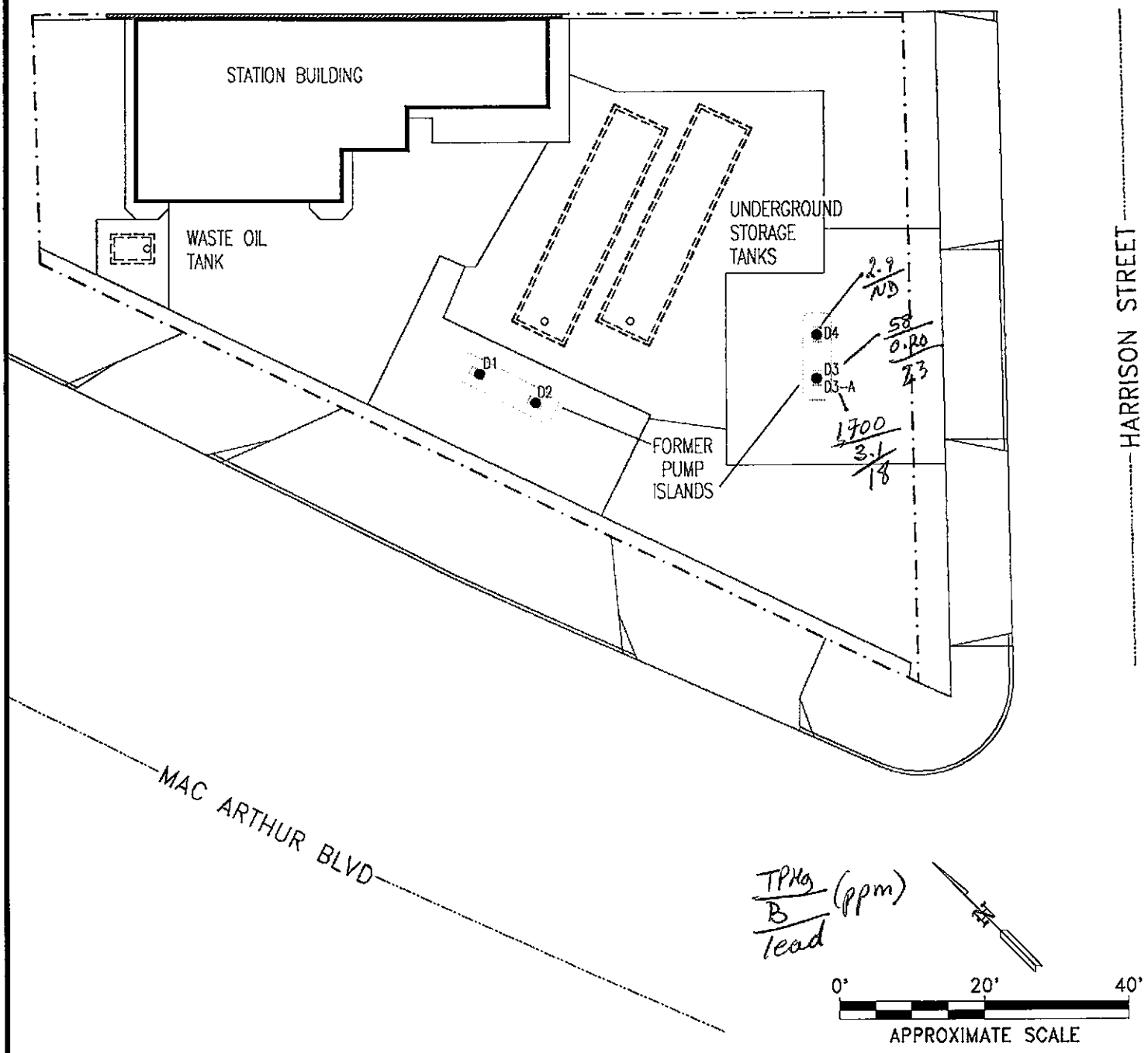
COMPILED BY:	P.S.
PREPARED BY:	R.P.
PROJECT MNGR.	P.S.
DATE:	05/92
SCALE:	AS SHOWN
PROJECT NO.	27001W
FILE NAME:	UN1871XX

PREPARED FOR: UNOCAL

TITLE: SITE PLAN

UNOCAL FACILITY NO. 1871

FIGURE 2



EXPLANATION:

- UNDERGROUND STORAGE TANK
- PROPERTY BOUNDARY LINE
- ●D1 SOIL SAMPLE LOCATION AND DESIGNATION.

SOURCE:

MAP MODIFIED FROM BLUEPRINT PROVIDED BY, UNOCAL 76, 04/92.

ROUX ASSOCIATES, INC.
ENVIRONMENTAL CONSULTING & MANAGEMENT

COMPILED BY:	P.S.
PREPARED BY:	R.P.
PROJECT MNGR.	P.S.
DATE:	05/92
SCALE:	AS SHOWN
PROJECT NO.	27001W
FILE NAME:	UN1871XX

PREPARED FOR: UNOCAL

TITLE: SOIL SAMPLE LOCATIONS

UNOCAL FACILITY NO. 1871

FIGURE 3

APPENDIX A

Laboratory Analytical Reports

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Roux Associates	Client Project ID:	Unocal 1871/#27001W	Sampled:	May 13, 1992
1855 Gateway Blvd. Suite 770	Matrix Descript:	Soil	Received:	May 13, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Analyzed:	5/13-14/1992
Attention: Paul Supple	First Sample #:	205-0566	Reported:	May 14, 1992

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
205-0566	D1	N.D.	N.D.	N.D.	N.D.	N.D.
205-0567	D2	N.D.	N.D.	N.D.	N.D.	N.D.
205-0568	D3	58	0.20	0.087	0.52	0.97
Detection Limits:		**1.0**	**0.0050**	**0.0050**	**0.0050**	**0.0050**

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

Kenneth K.F. Lee
Laboratory Director

2050566.ROU <1>

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Roux Associates	Client Project ID:	Unocal 1871/#27001W	Sampled:	May 13, 1992
1855 Gateway Blvd. Suite 770	Matrix Descript:	Soil	Received:	May 13, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Analyzed:	5/13-14/1992
Attention: Paul Supple	First Sample #:	205-0569	Reported:	May 14, 1992

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

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
205-0569	D4	2.9	N.D.	N.D.	N.D.	0.0070
Detection Limits:		**10**	**0.050**	**0.050**	**0.050**	**0.050**

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. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL

Kenneth K.F. Lee
Laboratory Director

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Roux Associates	Client Project ID:	Unocal 1871/#27001W	Sampled:	May 13, 1992
1855 Gateway Blvd. Suite 770	Sample Descript:	Soil	Received:	May 13, 1992
Concord, CA 94520	Analysis for:	Total Lead	Extracted:	May 14, 1992
Attention: Paul Supple	First Sample #:	205-0566	Analyzed:	May 14, 1992
			Reported:	May 14, 1992

LABORATORY ANALYSIS FOR: Total Lead

Sample Number	Sample Description	Detection Limit mg/kg	Sample Result mg/kg
205-0566	D1	0.25	2.4
205-0567	D2	0.25	2.6
205-0568	D3	0.25	23
205-0569	D4	0.25	4.8

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Kenneth K.F. Lee
Laboratory Director

2050566.ROU <3>

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Roux Associates
1855 Gateway Blvd. Suite 770
Concord, CA 94520
Attention: Paul Supple

Client Project ID: Unocal 1871/#27001W

QC Sample Group: 2050566-9

Reported: May 14, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes	Toal Lead
Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 7421
Analyst:	K.N.	K.N.	K.N.	K.N.	K.A.
Reporting Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Date Analyzed:	May 13, 1992	May 13, 1992	May 13, 1992	May 13, 1992	May 14, 1992
QC Sample #:	Matrix Blank	Matrix Blank	Matrix Blank	Matrix Blank	205-0566
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	2.4
Spike Conc. Added:	0.40	0.40	0.40	1.2	50
Conc. Matrix Spike:	0.34	0.44	0.45	1.3	42
Matrix Spike % Recovery:	85	110	113	108	79
Conc. Matrix Spike Dup.:	0.34	0.43	0.43	1.2	40
Matrix Spike Duplicate % Recovery:	85	108	108	100	75
Relative % Difference:	0.0	2.3	4.5	8.0	4.9

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Kenneth K.F. Lee
Laboratory Director

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

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

SEQUOIA ANALYTICAL

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Roux Associates	Client Project ID:	Unocal 1871/27001W	Sampled:	May 18, 1992
1855 Gateway Blvd. Suite 770	Sample Descript.:	Soil, D3-A	Received:	May 18, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Analyzed:	May 18, 1992
Attention: Paul Supple	Lab Number:	205-0800	Reported:	May 19, 1992

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

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Low to Medium Boiling Point Hydrocarbons	50	1,700
Benzene	0.25	3.1
Toluene	0.25	1.0
Ethyl Benzene	0.25	11
Xylenes	0.25	5.4

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. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL

Kenneth K.F. Lee
Laboratory Director

Please Note: The above sample appears to contain gasoline.

2050800.ROU <1>

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Roux Associates	Client Project ID:	Unocal 1871/27001W	Sampled:	May 18, 1992
1855 Gateway Blvd. Suite 770	Sample Descript:	Soil, D3-A	Received:	May 18, 1992
Concord, CA 94520			Extracted:	May 19, 1992
Attention: Paul Supple	Lab Number:	205-0800	Analyzed:	May 19, 1992
			Reported:	May 19, 1992

LABORATORY ANALYSIS

Analyte	Detection Limit mg/kg	Sample Results mg/kg
Total Lead	5.0	18

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Kenneth K.F. Lee
Laboratory Director

2050800.ROU <2>

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Roux Associates
1855 Gateway Blvd. Suite 770
Concord, CA 94520
Attention: Paul Supple

Client Project ID: Unocal 1871/27001W

QC Sample Group: 205-0800

Reported: May 19, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes	Lead
Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 7420
Analyst:	A.T.	A.T.	A.T.	A.T.	K.A.
Reporting Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Date Analyzed:	May 18, 1992	May 18, 1992	May 18, 1992	May 18, 1992	May 19, 1992
QC Sample #:	Matrix Blank	Matrix Blank	Matrix Blank	Matrix Blank	205-0800
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	18
Spike Conc. Added:	0.40	0.40	0.40	1.2	50
Conc. Matrix Spike:	0.50	0.51	0.51	1.5	70
Matrix Spike % Recovery:	125	128	128	125	104
Conc. Matrix Spike Dup.:	0.51	0.50	0.48	1.4	70
Matrix Spike Duplicate % Recovery:	128	125	120	117	104
Relative % Difference:	2.0	2.0	6.1	6.9	0.0

SEQUOIA ANALYTICAL

Kenneth K.F. Lee
Laboratory Director

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

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
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SP Composite

Roux Associates	Client Project ID:	Unocal #1871/ 27001W	Sampled:	May 18, 1992
1855 Gateway Blvd. Suite 770	Sample Descript.:	Soil, CS-1 (A-D)	Received:	May 20, 1992
Concord, CA 94520	Analysis Method:	EPA 5030/8015/8020	Analyzed:	May 27, 1992
Attention: Todd Ramsden	Lab Number:	205-0898	Reported:	May 28, 1992

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

Analyte	Detection Limit mg/kg (ppm)	Sample Results mg/kg (ppm)
Low to Medium Boiling Point Hydrocarbons	1.0	32
Benzene	0.0050	0.015
Toluene	0.0050	0.0056
Ethyl Benzene	0.0050	0.12
Xylenes	0.0050	0.25

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

Kenneth K.F. Lee
Laboratory Director

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Roux Associates	Client Project ID:	Unocal #1871/ 27001W	Sampled:	May 18, 1992
1855 Gateway Blvd. Suite 770	Sample Descript:	Soil	Received:	May 20, 1992
Concord, CA 94520	Analysis Method:	California LUFT Manual, 12/87	Extracted:	May 27, 1992
Attention: Todd Ramsden	First Sample #:	205-0898	Analyzed:	May 27, 1992
			Reported:	May 28, 1992

ORGANIC LEAD

Sample Number	Sample Description	Sample Results mg/kg (ppm)
205-0898	CS-1 (A-D)	N.D.

Detection Limits:	0.050

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Kenneth K.F. Lee
Laboratory Director

SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520
(510) 686-9600 • FAX (510) 686-9689

Roux Associates
1855 Gateway Blvd. Suite 770
Concord, CA 94520
Attention: Todd Ramsden

Client Project ID: Unocal #1871/ 27001W

QC Sample Group: 205-0898

Reported: May 28, 1992

QUALITY CONTROL DATA REPORT

ANALYTE	Benzene	Toluene	Ethyl-Benzene	Xylenes	Organic Lead
Method:	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	EPA 8015/8020	LUFT
Analyst:	K.N.	K.N.	K.N.	K.N.	K.Anderson
Reporting Units:	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
Date Analyzed:	May 27, 1992	May 27, 1992	May 27, 1992	May 27, 1992	May 27, 1992
QC Sample #:	Matrix Blank	Matrix Blank	Matrix Blank	Matrix Blank	205-0898
Sample Conc.:	N.D.	N.D.	N.D.	N.D.	N.D.
Spike Conc. Added:	0.40	0.40	0.40	1.2	10
Conc. Matrix Spike:	0.46	0.46	0.47	1.5	9.7
Matrix Spike % Recovery:	115	115	118	125	97
Conc. Matrix Spike Dup.:	0.46	0.46	0.48	1.5	9.8
Matrix Spike Duplicate % Recovery:	115	115	120	125	98
Relative % Difference:	0.0	0.0	2.1	0.0	1.0

SEQUOIA ANALYTICAL

Kenneth K.F. Lee
Laboratory Director

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

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

2050898.ROU <3>

APPENDIX B

Chain-of-Custody Documentation

ROUX

CHAIN OF CUSTODY

№ 00308 W

ROUX ASSOCIATES INC
Consulting Ground-Water Geologists & Engineers
1340 ARNOLD DRIVE, SUITE 231
MARTINEZ, CALIFORNIA 94553
(415) 370-2275 FAX. (415) 370-2235

ANALYSES

PROJECT NAME: UNOCAL 1811

PROJECT NUMBER: 27001W

PROJECT LOCATION: OAKLAND

SAMPLER(S): T. RAMSDEN

SAMPLE DESIGNATION/LOCATION	DATE COLLECTED	TIME COLLECTED	SAMPLE MATRIX	TPH-G/BTEX & TPH-D 8015/8020	TOTAL LEAD				TOTAL BOTTLES	NOTES
D1	5/13/92	1250	SOIL	X	X				1	2050566
D2	5/13/92	1240	SOIL	X	X				1	567
D3	5/13/92	1325	SOIL	X	X				1	568
D4	5/13/92	1310	SOIL	X	X				1	569

RELINQUISHED BY: (SAMPLER'S SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N	RECEIVED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N
Todd D Ramsden	Roux	5/13/92	1430	(Y) OR N	Kevin Van Stavoren	SAL	5/13/92	2:30 pm	(Y) OR N
RELINQUISHED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N	RECEIVED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N
RELINQUISHED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N	RECEIVED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N

DELIVERY METHOD: HAND

ANALYTICAL LABORATORY: SEQUOIA

COMMENTS: 24-Hour Turnaround

PROJECT MGR: PAUL SUPPLEE

CHAIN OF CUSTODY

№ 00309W

ROUX ASSOCIATES INC
Consulting Ground-Water Geologists & Engineers

1340 ARNOLD DRIVE, SUITE 231
MARTINEZ, CALIFORNIA 94553
(415) 370-2275 FAX. (415) 370-2235

ANALYSES

PAGE 1 OF 1

PROJECT NAME: UNOCAL 1871

PROJECT NUMBER: 27001W

PROJECT LOCATION: OAKLAND

SAMPLER(S): T. RAMSDEN

SAMPLE DESIGNATION/LOCATION	DATE COLLECTED	TIME COLLECTED	SAMPLE MATRIX	TPH-G/BTEX	TOTAL Pb				TOTAL BOTTLES	NOTES
D3 - A	5/18/92	1630	SOIL	X	X				1	2050800

RELINQUISHED BY: (SAMPLER'S SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N	RECEIVED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N
Todd W Ramsden	Roux	5/18/92	1730	Y	Kevin Van Steenbrugge	SRL	5/18/92	1730	Y
RELINQUISHED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N	RECEIVED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N
RELINQUISHED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N	RECEIVED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N

DELIVERY METHOD: HAND

ANALYTICAL LABORATORY: SEQUOIA

COMMENTS: PROJECT MANAGER: PAUL SUPPLEE

TURNAROUND TIME: 24 HOUR

ROUX

CHAIN OF CUSTODY

№ 00313W

ROUX ASSOCIATES INC
Consulting Ground-Water Geologists & Engineers
1340 ARNOLD DRIVE, SUITE 231
MARTINEZ, CALIFORNIA 94553
(415) 370-2275 FAX. (415) 370-2235

ANALYSES

PROJECT NAME: UNOCAL 1871

PROJECT NUMBER: 27001W

PROJECT LOCATION: OAKLAND

SAMPLER(S): T. RAMIREZ

SAMPLE DESIGNATION/LOCATION	DATE COLLECTED	TIME COLLECTED	SAMPLE MATRIX	TPH-G / BTEX	Organic Lead			TOTAL BOTTLES	NOTES
CS-1 (A-D)	5/18/92	1500	SOIL	X	X	2050898	AD	4	COMPOSITE

(HOLD) FOR AUTHORIZATION
* removed for analyses
→ 5/20/92 : 11:20 am per Todd for Gas/btex & Organic Lead on a 5 day T.A.T.
VJS

RELINQUISHED BY: (SAMPLER'S SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N	RECEIVED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N
Todd W Ramirez	Roux	5/18/92	1730	Y	Kevin VanStanbrook	SAL	5/18/92	1930	Y
RELINQUISHED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N	RECEIVED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N
RELINQUISHED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N	RECEIVED BY: (SIGNATURE)	FOR	DATE	TIME	SEAL INTACT Y OR N

DELIVERY METHOD: HAND

ANALYTICAL LABORATORY: SEQUOIA

COMMENTS: PROJECT MANAGER : PAUL SUPPLE

TURNAROUND TIME: 5 DAY

APPENDIX C

Soil Disposal Documentation

Dillard Trucking, Inc.

HAZARDOUS WASTE TRANSPORTATION
P.O. BOX 218 BYRON, CALIFORNIA 94514
(510) 634-6850 FAX (510) 634-0569

June 10, 1992

Roux and Associates
Concord, CA

FAX #510-687-1258

Attn: Paul

RE: Unocal #1871 - 96 MacArthur Blvd., Oakland

Dear Paul:

Please be advised that the bulk soil from the above referenced service station site has been removed.

The soil was transported to Redwood Landfill on 6-5-92. Attached find a copy of the landfill dump receipt.

If you have any questions please do not hesitate to contact me.

Sincerely,

DILLARD TRUCKING, INC.

Donna

Donna L. Pedersen
Office Manager

DLP/st

cc:file

REDWOOD LANDFILL INC.
8950 REDWOOD HIGHWAY
P.O. BOX 793
NOVATO, CALIFORNIA 94948
TEL: (415) 892-2851
FAX: (415) 898-1354

- PERSONS USING THESE PREMISES DO SO AT THEIR OWN RISK.
- CHILDREN AND PETS ARE NOT ALLOWED OUT OF VEHICLES.
- NO RUMMAGING IN DUMP AREA.
- NO SMOKING ON DUMP SITE.
- PLEASE NOTIFY OFFICE OF ANY COMPLAINT.

X R. Turner
DRIVER'S SIGNATURE

DP, LZ,,
RECEIVED BY

ACCOUNT NUMBER: 2345 CUSTOMER: DILLARD TRUCKING
JOB NUMBER: OAKLAND DESC: STATION 1871
VEHICLE: DILLARD TIME: 10:14:11 DATE: 6/ 5/92

COMMODITY: O.C./P.C. DIRT/PLAST YARDS: 18.00 LOAD # : 158

PER YARD 14.00 FEE 252.00

TOTAL 252.00
INVOICE: 43764

B1/S1-1 *** CHARGE CUSTOMER COPY