Mobil Oil Corporation

3800 WEST ALAMEDA AVENUE, SUITE 700
BURBANK, CALIFORNIA 91505-4331

October 18, 1988

Mr. Craig A. Mayfield
Alameda County
Flood Control Department
6997 Parkside Drive
Pleasanton, California 94566

MOBIL OIL CORPORATION
S/S #10-L1X
15884 HESPERIAN BOULEVARD
SAN LORENZO, CALIFORNIA

Dear Mr. Mayfield:

Attached is the Preliminary Subsurface Investigation for the subject location.

Mobil feels a three month monitoring program will assist in identifying the nature of the contamination. At the conclusion of that period, we can re-evaluate the status for additional monitoring or actions as warranted by sampling programs.

If you have any questions or require additional information, please contact Chris Mitchell at (818) 953-2519.

Sincerely,

R. J. Edwards
Region Environmental Manager

CTM:ars
attachment
18370

cc: Mr. Peter Johnson
Regional Water Quality Control Board
1111 Jackson Street, Room 6040
Oakland, California 94607

Mr. Rafat Shahid
Alameda County Environmental Health Dept.
470 27th Street, Room 324
Oakland, California 94612

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P. O. BOX 913
BENICIA, CA 94510
(415) 676 - 9100 (707) 746 - 6915

KEI-P87-128A-1
September 6, 1988

Mobil Oil Corporation
P. O. Box 127
Richmond, CA 94807

Attn: Mr. Steve Pao

RE: Preliminary Subsurface Investigation at
Mobil Service Station #10-LIX
15884 Hesperian Blvd.
San Lorenzo, California

Dear Mr. Pao:

This report presents the results of our work for the replacement of one groundwater monitoring well in accordance with our proposal dated May 13, 1988 for the referenced site. The work performed consisted of the following:

1. Drilling and installation of one monitoring well.
2. Soil sampling.
3. Groundwater purging/sampling.
4. Laboratory analyses.
5. Data analysis, interpretation and report preparation.

BACKGROUND

The subject site is presently under construction. The previous business was a Mobil Service Station. The site vicinity and site details are shown on the attached sketches.

Three underground fuel tanks and one waste oil tank were removed from the site in March, 1986, and four (4) fiberglass tanks were installed. Soil samples were collected by Blaine Tech Services. Analytical results of the soil samples from the fuel tank pit showed total petroleum hydrocarbon (TPH) levels ranging from 37 to 1100 ppm. KEI installed four groundwater monitoring wells at the site in July, 1986 to determine the degree of the shallow groundwater contamination. On December 21, 1987, four (4) fiberglass U.G. fuel storage tanks were removed from the site. Eight (8) soil samples were collected by KEI. Analytical results of the soil samples showed TPH levels ranging from 1.6 to 1100 ppm. From January 10 to March 4, 1988, approximately 620 cubic

yards of soil was excavated in an attempt to remove as much contaminated soil as possible. However, during the removal of the U. G. fuel storage tanks, well MW-2 was destroyed. The replacement of MW-2 is described in this report.

FIELD INVESTIGATION

On August 8, 1988, one (1) two-inch diameter groundwater monitoring well (designated as MW-2 on the attached Location Plan) was installed at the site. The well was drilled, constructed and completed in accordance with the guidelines of the California Regional Water Quality Control Board and the county well standards.

The subsurface materials penetrated and details of the construction of the wells are described in the attached Exploratory Boring Logs.

The well was drilled and completed to a total depth of 30 feet below grade. Groundwater was encountered at approximately 14 feet beneath the surface during drilling. Soil samples were taken at five and ten feet below grade by driving a California-modified split-spoon sampler ahead of the drilling augers. The brass liners holding the samples were sealed with aluminum foil, plastic caps and tape, and were stored in a cooled ice chest for delivery to a certified laboratory. The well was installed with a waterproof cap and padlock. Existing wells MW-1, MW-3 and MW-4 could not be located.

The well was developed on August 11, 1988 and sampled on August 25, 1988. Prior to development, the well was checked for depth to water table using an electronic sounder, presence of odor, and floating product. No floating product, odor or sheen was noted in the well. Monitoring data are summarized in Table 1. After recording the monitoring data, the well was pumped with a surface pump until the evacuated water was clear and free of suspended sediment. Prior to sampling, monitoring data were collected and the well was purged a minimum of four casing volumes using a clean Teflon bailer. One water sample was collected and decanted into a clean glass VOA vial, sealed with Teflon lined screw cap, and was labeled and stored on ice until delivery to a certified laboratory.

LABORATORY ANALYSES

The soil and water samples were analyzed at Sequoia Analytical Laboratory of Redwood City. All samples were accompanied by properly executed chain of custody documentation. The samples

were analyzed for total petroleum hydrocarbon (TPH) as gasoline, benzene, toluene, xylene and ethylbenzene (BTXE) concentrations using EPA methods 5030, 8020 and 8015. The results of the soil analyses are summarized in Table 2 and water analyses in Table 3. Copies of the laboratory analyses and chain of custody forms are attached to this report.

GEOLOGY AND HYDROGEOLOGY

The groundwater stabilized in the boring at a depth of 14.7 feet below the surface. The subsurface formations at the site consist of silty clay to a depth of about 5 feet, followed by clayey gravel to 26 feet, and clay from 26 feet to the total depth explored.

DISCUSSION AND RECOMMENDATION

The results of this investigation are as follows:

1. The soil sample results show non-detectable levels of TPH and BTXE in all samples.

2. The water sample analyses show a benzene levels of 63 ppb in MW-2. As noted, the pre-existing wells could not be found and therefore were not sampled.

Based on the level of benzene in MW-2, KEI recommends that a monitoring and sampling program be implemented at the site. The proposed program should consist of monthly monitoring and sampling on a quarterly basis. The proposed program should be conducted for a period of three (3) months. The monitoring and sampling program should be reevaluated after three (3) months for the possibility of further defining the extent of groundwater contamination. Our proposal for this work is attached for your consideration.

Copies of this report should be sent to the Alameda County Department of Environmental Health, to the Alameda County Flood Control District, and to the Regional Water Quality Control Board.

LIMITATIONS

Soil deposits and rock formations may vary in thickness, lithology, saturation, strength and other properties across any site. In addition, environmental changes, either naturally-occurring or artificially-induced, may cause changes in groundwater levels and flow paths, thereby changing the extent and concentration of any contaminants. Our studies assume that

the field and laboratory data are reasonably representative of the site as a whole, and assume that subsurface conditions are reasonably conducive to interpolation and extrapolation.

The results of this study are based on the data obtained from the field and laboratory investigations. We have analyzed this data using what we believe to be currently applicable engineering techniques and principles in the Northern California region. We make no warranty, either expressed or implied, except that our services have been performed in accordance with generally accepted professional principles and practices existing for such work.

Should you have any questions regarding this report, please do not hesitate to call me at (707) 746-6915.

Sincerely,

Kaprealian Engineering, Inc.

Jae Yang, P. E.

License No. 25337
Exp. Date 12/3/89

Mardo Kaprealian
President

Attachments: Tables 1 & 2
Location Plan
Boring Logs
Laboratory Results
Chain of Custody Forms
Proposal

TABLE 1

Summary of Monitoring Data

Well #	Depth To Water	Product Thickness	Odor	Sheen	Gallons Pumped
MW-2	14.7'	0	None	None	55

TABLE - 2

Results of Soil Analyses - Parts Per Million

Sample Number	Depth (feet)	TPH	Benzene	Toluene	Xylene	Ethylbenzene
MW-2	5	ND	ND	ND	ND	ND
MW-2	10	ND	ND	ND	ND	ND

TPH = Total Petroleum Hydrocarbon
ND = Not Detected

TABLE 3

RESULTS OF GROUNDWATER ANALYSES
Concentrations are in Parts Per Billion)

Date	Parameter	MW-1	MW-2	MW-3	MW-4
8-25-88	TPH	--	2,300	--	--
	Benzene	--	63	--	--
	Toluene	--	3.3	--	--
	Xylene	--	240	--	--
9-02-87	TPH	ND	710,000	ND	ND
	Benzene	ND	980	ND	ND
	Toluene	ND	3,000	ND	ND
	Xylene	ND	33,000	ND	ND
4-25-87	TPH	ND	660	ND	ND
	Benzene	ND	2.2	ND	ND
	Toluene	ND	ND	ND	ND
	Xylene	ND	9.2	ND	ND
12/23/86	TPH	77	4,100	ND	ND
	Benzene	32	970	ND	ND
	Toluene	4.7	96	ND	ND
	Xylene	2.0	750	ND	ND
8-18-86	TPH	ND	58,000	ND	ND
	Benzene	ND	4,300	ND	ND
	Toluene	ND	390	ND	ND
	Xylene	ND	1,800	ND	ND

TPH = Total Petroleum Hydrocarbon
ND = Not Detected

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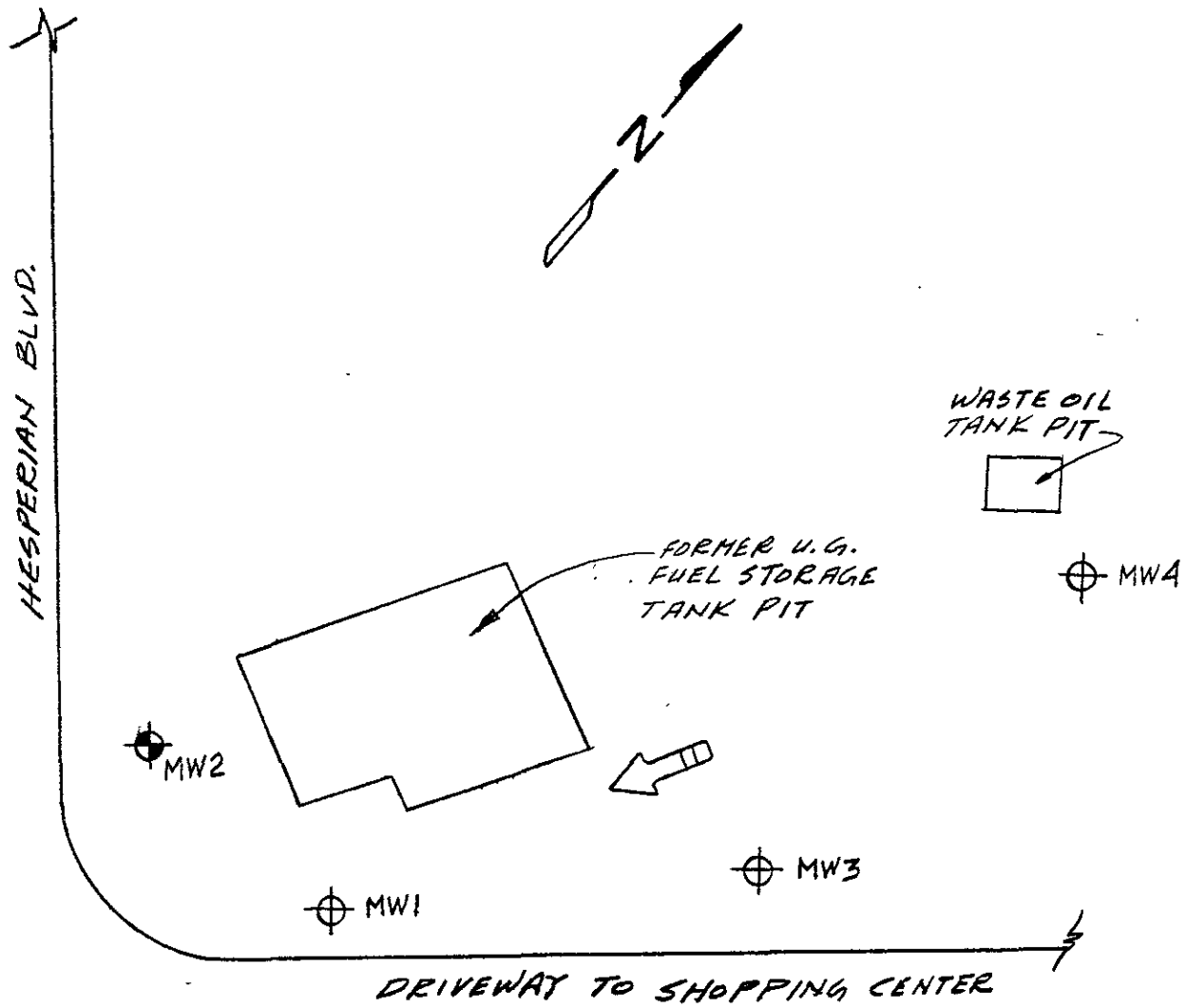


LOCATION PLAN
N.T.S.

- MONITORING WELL
- MONITORING WELL (UNABLE TO LOCATE)
- GENERAL DIRECTION OF GROUNDWATER FLOW

MOBL S/S #10-LIX
15884 HESPERIAN BLVD.
SAN LORENZO, CALIF.

Exploratory Boring Log

Project No. KEI-P87-128A	Boring & Casing Diameter 8 in. 2 in. csg.	Logged By JS
Project Name Mobil #10-LIX	Casing Elevation	Date Drilled 8-8-88
Boring No. MW-2	Hollow-stem Flight Auger	Depth to Groundwater 14 ft.

Penetration blows/ft	G. W. level	Depth (ft) Samples	Lithography USCS	Description
		0	ML	SILTY CLAY: dark brown, moderately plastic, very well sorted, stiff
		5	GC	CLAYEY GRAVEL: grey, moderately plastic clay, rounded gravel up to 1 cm., well graded
				less clay with depth
	▼	10		
		15		
		20		

Exploratory Boring Log

Project No. KEI-P87-128A	Boring & Casing Diameter	Logged By
Project Name Mobil #10-LIX	Casing Elevation	Date Drilled 8-8-88
Boring No. MW-2	Hollow-stem Flight Auger	Depth to Groundwater

Penetration blows/ft	G. W. level	Depth (ft) Samples	Lithography USCS	Description
		20		
				CLAYEY GRAVEL: as above
		25		
			CH	CLAY: grey, stiff, highly plastic, dry
		30		
				TOTAL DEPTH 30 FEET
		35		
		40		

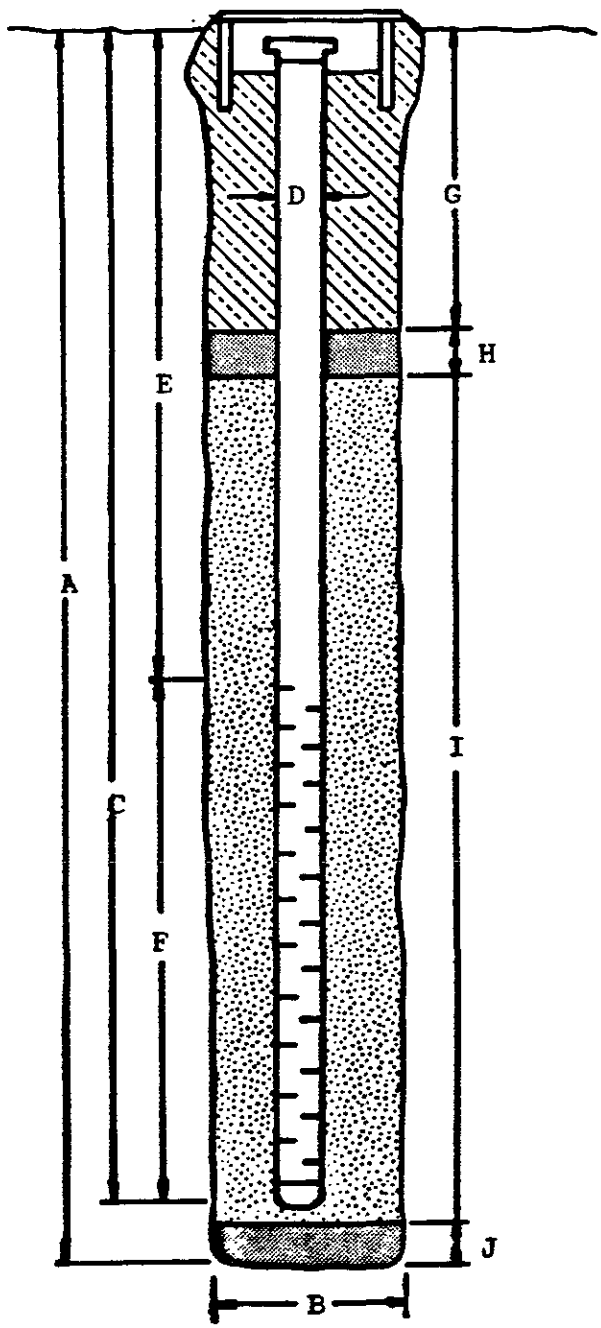
WELL DETAILS

PROJECT NAME: Mobil #10-LIX 15884 Hesperian Blvd . BORING/WELL NO. MW-2
San Lorenzo, CA

PROJECT NUMBER: KEI-P87-128A CASING ELEVATION:

WELL PERMIT NO.: 88356 Alameda Co. Flood Contro SURFACE ELEVATION:

G-5 Vault Box



A. Total Depth: 29 ft.

B. Boring Diameter: 8 in.

Drilling method: Hollow stem

C. Casing Length: 29 ft.

Material: Schedule 40 PVC

D. Casing Diameter: 2 in.

E. Depth to Perforations: 7 ft.

F. Perforated Length: 22 ft.

Perforated Interval: 29 to 7 ft.

Perforation Type: slot

Perforation Size: 0.02 in.

G. Surface Seal: 4 to 0 ft.

Seal Material: concrete

H. Seal: 5 to 4 ft.

Seal Material: bentonite

I. Gravel Pack: 29 to 5 ft.

Pack Material: Monterey sand

Size: No. 3

J. Bottom Seal: none

Seal Material:

Key To Boring Logs

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS — MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS — MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS — LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS — LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

DEFINITION OF TERMS

U.S. STANDARD SERIES SIEVE				CLEAR SQUARE SIEVE OPENINGS			
200	40	10	4	3/4"	3"	12"	
SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

GRAIN SIZES

SANDS AND GRAVELS	BLOWS/FOOT†
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

RELATIVE DENSITY

SILTS AND CLAYS	STRENGTH‡	BLOWS/FOOT†
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

CONSISTENCY

†Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D (1-3/8 inch I.D) split spoon (ASTM D-1586).

‡Unconfined compressive strength in tons/sq. ft. as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

UNIFIED SOIL CLASSIFICATION SYSTEM
(ASTM D-2487)

Soil Color derived from the MUNSELL Soil Color Charts

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222 • FAX (415) 364-9233

Kaprealian Engineering, Inc.
P.O. Box 913
Benicia, CA 94510
Attn: Mardo Kaprealian, P.E.
President

Date Sampled: 08/08/88
Date Received: 08/10/88
Date Analyzed: 08/22/88
Date Reported: 08/25/88

Project: Mobil, San Lorenzo, Hesperian

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTEX DISTINCTION

Sample Number	Sample Description Soil	Low to Medium Boiling Point Hydrocarbons ppm	Benzene ppm	Toluene ppm	Ethyl Benzene ppm	Xylenes ppm
8080983	MW-2 (5')	N.D.	N.D.	N.D.	N.D.	N.D.
8080984	MW-2 (10')	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		1.0	0.05	0.1	0.1	0.1

Method of Analysis: EPA 5030 or 3810/8015/8020

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

KAPREALIAN ENGINEERING, INC.
Consulting Engineers
P. O. BOX 913
BENICIA, CA 94510
(415) 676-9100 (707) 746-6915

CHAIN OF CUSTODY

SAMPLER: Jean Semandy (signature) KEI
DATE/TIME OF COLLECTION: 8/8/88
TURN AROUND TIME: Routine

SAMPLE DESCRIPTION AND PROJECT NUMBER: Mobil San Lorenzo
15884 Hesperian

SAMPLE #	ANALYSES	GRAB OR COMP.	NUMBER OF CONTAINERS	SOIL/ WATER
MW-2(5')	TPH BTXE	grab	1	Soil
MW2(10')	TPH BTXE	grab	1	Soil

RELINQUISHED BY*	TIME/DATE	RECEIVED BY*	TIME/DATE
1. Jean Semandy KEI	8/9/88	(H)	11:30 AM 8/10/88
2. (H)	1200 PM 8/10/88	Ron Nelson	8/10/88 1:10 PM
3.			
4.			

* STATE AFFILIATION NEXT TO SIGNATURE

REMARKS:

SEQUOIA Analytical Laboratory
2549 Middlefield Road
Redwood City, CA 94063 • (415) 364-9222 • FAX (415) 364-9233

Kaprealian Engineering, Inc.
P.O. Box 913
Benicia, CA 94510
Attn: Mardo Kaprealian, P.E.
President

Date Sampled: 08/25/88
Date Received: 08/26/88
Date Analyzed: 08/30/88
Date Reported: 09/01/88

Project: Mobil, San Lorenzo, Hesperian

TOTAL PETROLEUM FUEL HYDROCARBONS WITH BTEX DISTINCTION

Sample Number	Sample Description
8082390	Water, MW2

	Detection Limit ppb	Sample Results ppb
Low to Medium Boiling Point Hydrocarbons	50	2300
Benzene	0.5	63
Toluene	0.5	3.3
Ethyl Benzene	0.5	N.D.
Xylenes	0.5	240

Method of Analysis: EPA 5030/8015/8020

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

SEQUOIA ANALYTICAL LABORATORY

Arthur G. Burton
Laboratory Director

RAPPEALIAN ENGINEERING, INC.

CHAIN OF CUSTODY

SAMPLER: Ray (KEI) (signature)

DATE/TIME OF COLLECTION: 8/25/88

TURNAROUND TIME: 1 WEEK

SAMPLE DESCRIPTION AND PROJECT NUMBER: MOBIL SAN LORENZO HESPERIAN

SAMPLE #	ANALYSIS	GRAB OR COMP.	NUMBER OF CONTAINERS	SOIL/ WATER
MW2	TPH. BTXE	Grab	2	W

RELINQUISHED BY*	TIME/DATE	RECEIVED BY*	TIME/DATE
1. Ray (KEI)	19:00 8/25/88		8/25 19:[illegible]
2.			
3.			
4.			

* STATE AFFILIATION NEXT TO SIGNATURE

REMARKS: