PACIFIC
ENVIRONMENTAL
GROUP, INC.

ST10 1747

Date: September 11, 1997
Project: 311-038.1B

To: Mr. Kevin Tinsley
Almadea County
Enviromental Health Services
1131 Harbor Bay Pkwy., # 250
Alameda, CA 94502-6577

We have enclosed:

Copies	Description
X	Copy of Soil and Groundwater Investigation Unocal Service Station 5430

For your:
___ Use
___ Approval
X Review
X Information

Comments: Dear Mr. Tinsley:
Per Ms. Tina Berry's request, we are sending a copy of this report for your information.

Joe Muzzio

2025 Gateway Place, Suite 440, San Jose, California 95110 (408) 441-7500 FAX (408) 441-7539

PACIFIC
ENVIRONMENTAL
GROUP INC.

ENVIRONMENTAL
PROTECTION
97 SEP 19 PM 1:22

Date: September 11, 1997
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To: Mr. Kevin Tinsley
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PACIFIC
ENVIRONMENTAL
GROUP, INC.

September 11, 1997
Project 311-038.1B

(510) 337-9330

Ms. Tina Berry
Tosco Marketing Company
2000 Crow Canyon Place, Suite 400
San Ramon, California 94583

Re: Soil and Groundwater Investigation
UNOCAL Service Station 5430
1935 Washington Avenue
San Leandro, California

Dear Ms. Berry:

Pacific Environmental Group, Inc. (PACIFIC) has prepared this letter on behalf of Tosco Marketing Company (Tosco), to document the results of a soil and groundwater investigation performed at the site referenced above (Figure 1). The purpose of the investigation was to further define the extent of petroleum hydrocarbon-impacted soil and groundwater southwest and downgradient of the site. To this end, PACIFIC advanced three direct-push borings on July 22, 1997. Soil samples, and groundwater if it was encountered, were collected at the time of boring advancement.

The investigation was performed consistent with the procedures included in PACIFIC's, *Work Plan for Additional Site Investigation* dated January 15, 1997. The work plan was prepared in response to the Alameda County Health Care Services Agency's (ACHSCA's) letter, dated November 22, 1995, in which they requested that an additional investigation be performed to further define the lateral and vertical extent of hydrocarbon-impacted soil and groundwater beneath the service station property. ACHSCA staff approved the work plan in a letter to Tosco dated January 22, 1996.

This letter presents the following: site background information, a summary of field activities performed during this investigation, findings, conclusions, and recommendations.

BACKGROUND

The site has been an active UNOCAL service station since 1965. The service station facilities include two 10,000-gallon fiberglass gasoline underground storage tanks (USTs), one 280-gallon used oil UST, two product dispenser islands, and the station

building containing one service bay (Figure 1). According to UNOCAL files, repairs were made to the underground product piping in 1976. The current fuel USTs were installed in 1981 and are located in the original UST excavation.

A *Phase I Environmental Site Assessment* dated May 28, 1993, indicated five sites within 1/4 mile of the UNOCAL station which appear on the leaking UST list of the Regional Water Quality Control Board - San Francisco Bay Region. The report provides photographs indicating that an auto sales business formerly occupied the property directly southwest of the UNOCAL station. This property, which presently contains a car wash, may have used on-site USTs in the past.

Subsurface investigations at the site were initiated in August 1993, and have included the advancement of five exploratory soil borings, designated U-A through U-E, and the installation of seven groundwater monitoring wells, designated U-1 through U-7.

Detectable levels of gasoline and diesel constituents have been measured in soil samples collected at a depth of approximately 30 feet below ground surface (bgs) from the exploratory borings located in the vicinity of the product dispenser islands.

Quarterly groundwater monitoring and sampling has been performed since 1993. Groundwater has been measured at depths ranging from approximately 25 to 33 feet bgs since monitoring was initiated. The direction of groundwater flow has varied from south-southwesterly, typically under a shallow hydraulic gradient. The maximum range of groundwater flow directions during the period of December 1993 through March 1997 is shown on Figure 1.

Detectable levels of total purgeable petroleum hydrocarbons calculated as gasoline (TPPH-g) and benzene, toluene, ethylbenzene, and xylenes (BTEX compounds) have been measured in groundwater samples collected from the vicinity of the product dispenser islands and the fuel USTs. Petroleum hydrocarbon constituents have not been detected in samples collected from wells located at the northern, western, and eastern boundaries of the site. Therefore, the lateral extent of hydrocarbon impact to groundwater appears to have been delineated in all directions, except to the south and southwest in the vicinity of Wells U-1 and U-6.

SCOPE OF WORK

On July 22, 1997, three direct-push soil borings, designated B-1 through B-3, were advanced on the car wash property located south of the UNOCAL service station. The maximum depth explored was 46.5 feet bgs. A fourth boring, originally proposed at a location west of the UNOCAL property, approximately 60 feet west of Well U-1 was not installed because Tosco could not obtain a signed license agreement from the private property owner.

The three borings were advanced to collect soil and groundwater samples to define the lateral extent of petroleum hydrocarbon impact toward the south and southwest of the site. Selected soil and groundwater samples were analyzed for TPPH-g, BTEX compounds, and methyl tert-butyl ether (MtBE).

In accordance with Tosco assessment procedures, geotechnical analyses were performed on soil samples collected from Boring B-1. These analyses were performed to provide Tosco soil characteristic parameters for potential use in future risk assessment evaluation. Soil samples collected from 5, 15, 20, and 25 feet bgs were analyzed for: moisture content, porosity, bulk density, particle size, permeability, pH, and total organic carbon content.

Prior to initiating the drilling, groundwater was measured in Well U-6 at 29.6 feet bgs. Groundwater was encountered in Boring B-1, located approximately 45 feet southwest and hydraulically downgradient of Well U-6, at a depth of approximately 29 feet bgs. Groundwater samples were collected from this boring and submitted for chemical analyses.

Groundwater samples could not be collected from Borings B-2 or B-3. Borings B-2 and B-3 were advanced to total depths of 46.5 and 32 feet, respectively. Saturated fine-grained soils (silty clay) were observed in both these borings at approximately 30 feet bgs, however groundwater did not enter the borings to enable sample collection. A PVC well screen was placed into Boring B-3 to a total depth 32 feet, and the boring was allowed to stand open for approximately 2 hours to enable groundwater to enter the boring, however no groundwater entered during this time period. Lack of groundwater within these borings is attributable to one or both of the following: the relatively low permeability of the fine-grained soils exposed in the borings, and/or the drilling method which may have created a sidewall smear that inhibited groundwater flow into the borings.

Field procedures for advancing the exploratory borings and collecting soil and groundwater samples, and laboratory procedures for chemical analyses are presented as Attachment A. Detailed descriptions of the subsurface materials encountered in the borings are recorded on the boring logs presented as Attachment B. Certified analytical reports and chain-of-custody documentation are presented as Attachment C.

FINDINGS

Subsurface Conditions

Detailed descriptions of the subsurface materials encountered in the borings are recorded on the boring logs presented as Attachment B. Silty clay and silty sand horizons were encountered in the three borings from the ground surface to about 46.5 feet bgs, the maximum depth explored. Groundwater was first encountered within a horizon of

poorly-graded sand with silt, at a depth of 29.6 feet bgs, The water-bearing horizon was overlain by a sandy silt, suggesting that groundwater beneath the site is in an unconfined state.

Organic Vapor Analysis

Soil samples were collected at 5-foot depth intervals from each boring. Samples were field screened for organic vapors according to the procedure described in Attachment A. The measured concentrations of organic vapors were recorded on the boring logs in Attachment B. Headspace screening indicated non-detectable levels of organic vapors in the soil samples.

Soil Analytical Results

Detectable concentrations of TPPH-g, BTEX compounds, and MtBE were not identified in samples collected from the three borings. Laboratory analytical data are presented in Table 1 and Attachment C.

Groundwater Analytical Results

Detectable concentrations of TPPH-g, BTEX compounds, and MtBE were not identified in the groundwater sample collected from Boring B-1. Tabulated data are presented in Table 2 and Attachment C.

Soil Testing Results

Soil samples collected from Boring B-1 at 5, 10, 15, 20, and 25 feet bgs were analyzed for physical characteristics, including: moisture content, porosity, bulk density, particle size, permeability, pH, and total organic carbon content (Attachment C). Based on the test results, all samples were classified as sandy silts, with the exception of the sample collected at 15 feet bgs, which was classified as a poorly graded sand. Laboratory data are presented in Table 3.

CONCLUSIONS

Elevated levels of dissolved petroleum hydrocarbons have been historically detected in Wells U-3 and U-6 located on the UNOCAL station property. This indicates that a petroleum hydrocarbon plume occurs beneath the southern portion of the product islands as defined by Well U-3, and extends in a southerly direction toward Well U-6. The hydrocarbon plume is delineated to the east by upgradient Well U-7 and the north by crossgradient Well U-2.

Because petroleum hydrocarbons were not detected in the "grab" groundwater sample from Boring B-1, located approximately 45 feet southwest and hydraulically downgradient of Well U-6, it is concluded that the southern extent of the petroleum hydrocarbon

plume has been defined. It appears that the apparent low permeability of the fine-grained soils underlying the site has inhibited hydrocarbon migration to the south.

Well U-1 has contained no detectable concentrations of petroleum hydrocarbons during the last two consecutive monitoring events in September 1996 and March 1997. Based on these analytical data, it appears that the petroleum hydrocarbon plume west of the product islands is currently delineated by Well U-1.

DISTRIBUTION

PACIFIC recommends that a copy of this letter be sent to Mr. Kevin Tinsley, Hazardous Materials Specialist, of the ACHSCA.

Should you have questions or comments regarding the results of this investigation, please feel free to contact our office.

Sincerely,

Pacific Environmental Group, Inc.

Joseph Muzzio
Project Geologist
CEG 1672

Attachments:
- Table 1 - Soil Analytical Data - Total Petroleum Hydrocarbons (TPPH as Gasoline and BTEX Compounds)
- Table 2 - Groundwater Analytical Data - Total Petroleum Hydrocarbons (TPPH as Gasoline, BTEX compounds, MtBE)
- Table 3 - Physical Properties of Soil
- Figure 1 - Site Map
- Attachment A - Field and Laboratory Procedures
- Attachment B - Exploratory Boring Logs
- Attachment C - Certified Analytical Reports and Chain-of-Custody Documentation

Table 1
Soil Analytical Data
Total Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, and MtBE)

Unocal Service Station 5430
1935 Washington Avenue
San Leandro, California

Sample ID	Sample Depth (feet)	Date Sampled	TPPH as Gasoline (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	MtBE (mg/kg)
B-1	10-10.5	07/22/97	ND	ND	ND	ND	ND	ND
	30-30.5		ND	ND	ND	ND	ND	ND
B-2	10-12.0	07/22/97	ND	ND	ND	ND	ND	ND
	30-32.0		ND	ND	ND	ND	ND	ND
B-3	10-12.0	07/22/97	ND	ND	ND	ND	ND	ND
	30-32.0		ND	ND	ND	ND	ND	ND

TPPH = Total purgeable petroleum hydrocarbons
MtBE = Methyl tert-butyl ether
mg/kg = Milligrams per kilogram
ND = Not detected

Table 2
Groundwater Analytical Data
Total Petroleum Hydrocarbons
(TPPH as Gasoline, BTEX Compounds, and MtBE)

Unocal Service Station 5430
1935 Washington Avenue
San Leandro, California

Well Number	Date Sampled	Depth to Water (feet)	TPPH as Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Ethyl-benzene (ppb)	Xylenes (ppb)	MtBE (ppb)
B-1	07/29/97	56.73	ND	ND	ND	ND	ND	ND

TPPH = Total purgeable petroleum hydrocarbons
MtBE = Methyl tert-butyl ether
ppb = Parts per billion
ND = Not detected

correct ?

Table 3
Physical Properties of Soil

Unocal Service Station 5430
1935 Washington Avenue
San Leandro, California

Sample ID	Sample Depth (feet)	Date Sampled	Moisture (% wt)	pH	Bulk Density (g/cc)	Effective Porosity (% Vb)	Effective Permeability (millidarcy)	USCS Soil Classification	Total Organic Content (mg/kg)
B-1	5	07/22/97	11.7	6.11	1.50	43.3	3.06	ML	1,400
	15		5.8	7.06	1.45	43.6	704	SP	1,150
	20		17.4	6.82	1.78	32.2	0.813	ML	450
	26		17.6	6.84	1.80	31.6	0.432	ML	160

g/cc = Grams per cubic centimeters
Vb = Bulk volume, cc
mg/kg = Milligrams per kilogram

N

WASHINGTON AVENUE

CASTRO STREET

HARLAN STREET

U-7

APPROACH | SIDEWALK | APPROACH

PLANTER

U-C

U-3

PRODUCT ISLAND (TYP)

UNDERGROUND FUEL STORAGE TANK (TYP)

U-E

U-2

U-B

U-A

U-6

U-5

APPROACH

STATION BUILDING

U-4

U-1

B-2

B-3

B-1

CAR WASH BUILDING

DRIVEWAY

WASTE OIL TANK

CYPRESS MANOR CONDOMINIUMS

CARPORT

CARPORT

RESIDENTIAL

SCALE

0 30 60 FEET

LEGEND

U-4 ◉ GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION

B-1, U-A ● SOIL BORING LOCATION AND DESIGNATION

MAXIMUM RANGE OF GROUNDWATER FLOW DIRECTION AS DETERMINED BY QUARTERLY MONITORING EVENTS BETWEEN 12-16-96 AND 3-8-97

D:\drawings\311\038\Sitemp30.vsd 8/19/97

PACIFIC ENVIRONMENTAL GROUP, INC.

TITLE:

SITE MAP

PREPARED FOR:

UNOCAL SERVICE STATION 5430
1936 Washington Avenue
San Leandro, California

DATE: 8-14-97 | PROJECT: 311-038.1B | FIGURE: 1

ATTACHMENT A

FIELD AND LABORATORY PROCEDURES

ATTACHMENT A
FIELD AND LABORATORY PROCEDURES

Soil Borings

Exploratory soil Borings B-1 through B-3 were advanced with pneumatically driven probes. Representative, undisturbed soil samples were collected from the borings for geologic logging, field hydrocarbon vapor screening and laboratory analysis. The undisturbed soil samples were collected in clear polyethylene liners, 18-inches in length, inserted into the probe rod and driven into the subsurface. Retrieved soil samples were logged by a Pacific Environmental Group, Inc. (PACIFIC) geologist using the Unified Soil Classification System (ASTM D2488). The borings were drilled to a maximum depth of 46.5 feet below ground surface (bgs). Lithologic logs for the borings are presented as Attachment B. The borings were abandoned by filling them to the ground surface with a cement slurry.

Soil samples collected at each interval were field screened using a HNU PI-101 photo-ionization detector (PID) to detect volatile organic compounds (VOCs). The PID is calibrated to 100 parts per million isobutylene gas at the start of each day it is in operation. For each sample, approximately 200 grams of soil was placed in a resealable plastic bag. After the temperature of the soil was allowed to equilibrate with the temperature of the surroundings, the probe tip of the PID was inserted into the bag. The highest measured concentration of VOCs within the headspace of the bag was recorded on the boring log in Attachment B.

Laboratory Sample Preparation

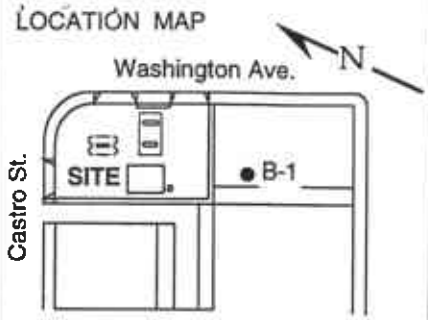
Selected soil samples from Borings B-1 through B-3, and the groundwater sample from Boring B-1, were prepared for shipment to a Sequoia Analytical of Redwood City, a Tosco approved, state-certified analytical laboratory accompanied by the appropriate chain-of-custody documentation.

Soil At each sampling interval, the bottom third of the sample liner was retained and prepared for shipment for chemical analysis. The ends of the liners were sealed with Teflon® tape and plastic end caps. Following identification of the sample it was paced directly into a chilled container for delivery to the laboratory.

Groundwater. Groundwater samples were pumped directly from the boring through polyethylene tubing and collected in 40 milliliter vials containing a preservative of diluted hydrochloric acid. Samples were identified and directly transferred to a chilled container for delivery to the laboratory.

Copies of the certified analytical reports and chain-of-custody documentation are presented as Attachment C.

LOCATION MAP



PACIFIC ENVIRONMENTAL GROUP, INC.

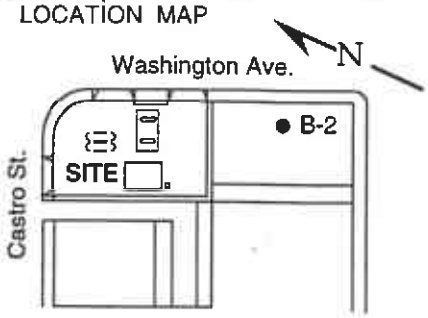
BORING NO. [redacted]
PAGE 1 OF 1

PROJECT NO. 311-038.1B
LOGGED BY: A.J.M.
DRILLER: EN PROBE
DRILLING METHOD: GEOPROBE
SAMPLING METHOD: GEOPROBE
CASING TYPE: NA
SLOT SIZE: NA
GRAVEL PACK: NA

CLIENT: UNOCAL
DATE DRILLED: 7-22-97
LOCATION: 1935 Washington St.
HOLE DIAMETER: 2"
HOLE DEPTH: 35.5'
WELL DIAMETER: NA
WELL DEPTH: NA
CASING STICKUP: NA

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY / SAMPLE INTERVAL / GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
Backfilled With Grout	Dp			2		CL	ASPHALT; CONCRETE; BASE COARSE SILTY CLAY: sandy; medium brown; no to low plasticity; 80-90% fines; 10-20% sand; no product odor.
	Mst	0		6		ML	SILT: medium brown; no plasticity; 95-100% silt; no product odor.
	Mst	0		10			
	Mst	0		16		SC	SILTY CLAYEY [redacted] medium brown; no plasticity; 10-30% silt and clay; 70-90% sand; no product odor.
				18		CL	SANDY CLAY: medium brown; moderate plasticity; 80-90% clay; 10-20% sand; no product odor.
				20		ML	CLAYEY SILT: medium brown; low plasticity; 95-100% fines; no product odor.
	Mst	0		26		CL	SILTY SANDY CLAY: medium brown; low to medium plasticity; 90-95% fines; 5-10% sand; no product odor.
	Sat	0		30		SM	SILTY SAND: medium brown; no plasticity; 5-10% silt; 90-95% fine grained sand; no product odor.
				36			BOTTOM OF BORING AT 35.5'

LOCATION MAP



PACIFIC ENVIRONMENTAL GROUP, INC.

BORING NO. B-2
PAGE 1 OF 2

PROJECT NO. 311-038.1B
LOGGED BY: A.J.M.
DRILLER: EN PROBE
DRILLING METHOD: GEOPROBE
SAMPLING METHOD: GEOPROBE
CASING TYPE: NA
SLOT SIZE: NA
GRAVEL PACK: NA

CLIENT: UNOCAL
DATE DRILLED: 7-22-97
LOCATION: 1935 Washington St.
HOLE DIAMETER: 2"
HOLE DEPTH: 46.5'
WELL DIAMETER: NA
WELL DEPTH: NA
CASING STICKUP: NA

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	SOIL TYPE	LITHOLOGY / REMARKS
Backfilled With Grout	Dp			2	CL	ASPHALT; CONCRETE; BASE COARSE SILTY CLAY: sandy; medium brown; low plasticity; 80-90% silt and clay; 10-20% sand; no product odor.
	Mst	0		6	SC	SILTY CLAYEY [illegible]: medium brown; low to moderate plasticity; 20-30% silt and clay; 70-80% sand; no product odor.
	Mst	0		10	SP	SAND: medium to yellowish brown; no plasticity; 90-100% very fine to fine grained sand; no product odor.
	Mst	0		16		@15': medium brown; no plasticity; 90-100% coarse to fine grained sand; no product odor.
	Mst	0		20		@20': medium brown; no plasticity; 90-100% fine to medium grained sand; no product odor.
	Mst	0		24	CL	SILTY CLAY: dark brown; low to moderate plasticity; 95-100% silt and clay; dense.
	Sat	0		30		@30': yellow to medium brown; low to moderate plasticity; 95-100% silt and clay.
	Mst	0		36		@35': yellow to medium brown; low to moderate plasticity; 95-100% silt and clay; trace sand.
	Mst	0		40		

LOCATION MAP

See Page One

PACIFIC ENVIRONMENTAL GROUP, INC.

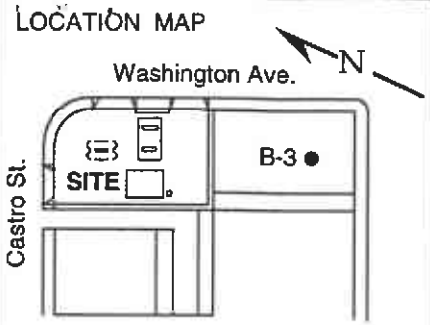
BORING NO. B-2
PAGE 2 OF 2

PROJECT NO. 311-038.1B
LOGGED BY:
DRILLER:
DRILLING METHOD:
SAMPLING METHOD:
CASING TYPE:
SLOT SIZE:
GRAVEL PACK:

CLIENT: UNOCAL
DATE DRILLED:
LOCATION:
HOLE DIAMETER:
HOLE DEPTH:
WELL DIAMETER:
WELL DEPTH:
CASING STICKUP:

WELL COMPLETION		MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY / SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
		Dp	NT		46			SP	SAND: poorly graded; no plasticity.
					48				BOTTOM OF BORING AT 46.5'
					50				
					52				
					54				
					56				
					58				
					60				
					62				
					64				
					66				
					68				
					70				
					72				
					74				
					76				
					78				
					80				
					82				
					84				
					86				
					88				

LOCATION MAP



PACIFIC ENVIRONMENTAL GROUP, INC.

BORING NO. [redacted]
PAGE 1 OF 1

PROJECT NO. 311-038.1B
LOGGED BY: A.J.M.
DRILLER: EN PROBE
DRILLING METHOD: GEOPROBE
SAMPLING METHOD: GEOPROBE
CASING TYPE: NA
SLOT SIZE: NA
GRAVEL PACK: NA

CLIENT: UNOCAL
DATE DRILLED: 7-22-97
LOCATION: 1935 Washington St.
HOLE DIAMETER: 2"
HOLE DEPTH: 32'
WELL DIAMETER: NA
WELL DEPTH: NA
CASING STICKUP: NA

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
Backfilled With Grout	Dp			2				CL	ASPHALT; CONCRETE; BASE COARSE SILTY CLAY: sand; medium brown; low to moderate plasticity; 80-90% silt and clay; 10-20% sand; no product odor.
	Dp-Mst	0		4					
				6				ML	SILT: light to medium brown; low plasticity; no product odor.
				8					
	Mst	0		10				SM	SILT[redacted] light to medium brown brown; low plasticity; 85-95% fine grained sand; 5-15% silt; no product odor.
				12					
	Dp-Mst	0		14				ML	SANDY SILT: clayey; light to medium; low plastiicty; trace mica; no product odor.
				16					
				18					
	Mst	0		20					@20': light to medium brown; low plasticity; no product odor.
				22					
				24				CL	SILTY CLAY: medium to dark brown; low to moderate plasticity; no product odor.
	Mst	0		26					
				28					
	Wt-Sat	0		30				S[redacted]	medium brown; low plasticity; no product odor.
				32					BOTTOM OF BORING AT 32'
				34					
				36					
				38					
				40					
				42					
				44					

ATTACHMENT C

CERTIFIED ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110

Attention: AJ Moore

Client Proj. ID: 311-038.1D/5430,San Leandro
Sample Descript: B-1
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9707D57-01

Sampled: 07/22/97
Received: 07/24/97

Analyzed: 07/29/97
Reported: 08/05/97

QC Batch Number: GC072997BTEX06A
Instrument ID: GCHP6

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Methyl t-Butyl Ether	2.5	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	94

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110

Attention: AJ Moore

Client Proj. ID: 311-038.1D/5430,San Leandro
Sample Descript: B-1 10-10.5'
Matrix: SOLID
Analysis Method: 8015Mod/8020
Lab Number: 9707D57-02

Sampled: 07/22/97
Received: 07/24/97
Extracted: 07/29/97
Analyzed: 07/30/97
Reported: 08/05/97

QC Batch Number: GC072997BTEXEXA
Instrument ID: GCHP18

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas	1.0	N.D.
Methyl t-Butyl Ether	0.025	N.D.
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Xylenes (Total)	0.0050	N.D.
Chromatogram Pattern:		N.D.

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	112
4-Bromofluorobenzene	60	140	97

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group 2025 Gateway Place, Suite 440 San Jose, CA 95110 Attention: AJ Moore	Client Proj. ID: 311-038.1D/5430,San Leandro Sample Descript: B-1 30-30.5' Matrix: SOLID Analysis Method: 8015Mod/8020 Lab Number: 9707D57-03	Sampled: 07/22/97 Received: 07/24/97 Extracted: 07/29/97 Analyzed: 07/30/97 Reported: 08/05/97

QC Batch Number: GC072997BTEXEXA
Instrument ID: GCHP18

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas	1.0	N.D.
Methyl t-Butyl Ether	0.025	N.D.
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Xylenes (Total)	0.0050	N.D.
Chromatogram Pattern:		N.D.

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	112
4-Bromofluorobenzene	60	140	99

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110

Attention: AJ Moore

Client Proj. ID: 311-038.1D/5430,San Leandro
Sample Descript: B-2 10-12'
Matrix: SOLID
Analysis Method: 8015Mod/8020
Lab Number: 9707D57-04

Sampled: 07/22/97
Received: 07/24/97
Extracted: 07/29/97
Analyzed: 07/31/97
Reported: 08/05/97

QC Batch Number: GC072997BTEXEXA
Instrument ID: GCHP1

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas	1.0	N.D.
Methyl t-Butyl Ether	0.025	N.D.
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Xylenes (Total)	0.0050	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	87
4-Bromofluorobenzene	60	140	94

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group 2025 Gateway Place, Suite 440 San Jose, CA 95110 Attention: AJ Moore	Client Proj. ID: 311-038.1D/5430,San Leandro Sample Descript: B-2 30-32' Matrix: SOLID Analysis Method: 8015Mod/8020 Lab Number: 9707D57-05	Sampled: 07/22/97 Received: 07/24/97 Extracted: 07/29/97 Analyzed: 07/31/97 Reported: 08/05/97

QC Batch Number: GC072997BTEXEXA
Instrument ID: GCHP18

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas	1.0	N.D.
Methyl t-Butyl Ether	0.025	N.D.
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Xylenes (Total)	0.0050	N.D.
Chromatogram Pattern:		N.D.

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	108
4-Bromofluorobenzene	60	140	108

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Proj. ID: 311-038.1D/5430,San Leandro	Sampled: 07/22/97
2025 Gateway Place, Suite 440	Sample Descript: B-3 10-12'	Received: 07/24/97
San Jose, CA 95110	Matrix: SOLID	Extracted: 07/29/97
	Analysis Method: 8015Mod/8020	Analyzed: 08/01/97
Attention: AJ Moore	Lab Number: 9707D57-06	Reported: 08/05/97

QC Batch Number: GC072997BTEXEXA
Instrument ID: GCHP07

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas	1.0	N.D.
Methyl t-Butyl Ether	0.025	N.D.
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Xylenes (Total)	0.0050	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	88
4-Bromofluorobenzene	60	140	74

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (650) 364-9600, FAX (650) 364-9233
404 N. Wiget Lane, Walnut Creek, CA 94598, (510) 988-9600, FAX (510) 988-9673
819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110

Attention: AJ Moore

Client Proj. ID: 311-038.1D/5430,San Leandro
Sample Descript: B-3 30-32'
Matrix: SOLID
Analysis Method: 8015Mod/8020
Lab Number: 9707D57-07

Sampled: 07/22/97
Received: 07/24/97
Extracted: 07/29/97
Analyzed: 07/31/97
Reported: 08/05/97

QC Batch Number: GC072997BTEXEXA
Instrument ID: GCHP18

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX and MTBE

Analyte	Detection Limit mg/Kg	Sample Results mg/Kg
TPPH as Gas	1.0	N.D.
Methyl t-Butyl Ether	0.025	N.D.
Benzene	0.0050	N.D.
Toluene	0.0050	N.D.
Ethyl Benzene	0.0050	N.D.
Xylenes (Total)	0.0050	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	108
4-Bromofluorobenzene	60	140	99

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

SEQUOIA ANALYTICAL - ELAP #1210

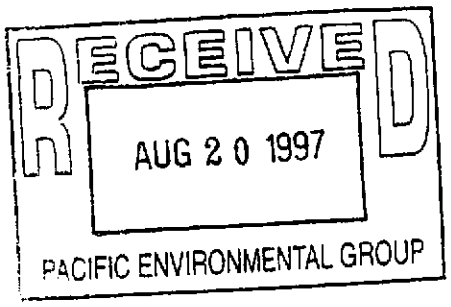
Tod Granicher
Project Manager

PTS Laboratories, Inc.

Geotechnical Services

8100 Secura Way • Santa Fe Springs • CA 90670
Phone (562) 907-3607 • Fax (562) 907-3610

August 14, 1997



Joe Muzzio
Pacific Environmental Group
2025 Gateway Place
San Jose, CA 95110

Re: Unocal Station 5430/311-038.1D
PTS File: 27236

Dear Mr. Muzzio:

Enclosed are final data for samples submitted from your Unocal Station Project # 5430/311-038.1D. All analyses were performed by applicable ASTM, EPA or API methodology. Samples will be retained for 30 days before disposal unless prior arrangements are made.

We appreciate the opportunity to be of service and trust these data will prove beneficial in the development of this project. Please feel free to call myself or Larry Kunkel, District Manager, should you have any questions or require additional information.

Sincerely,

PTS Laboratories, Inc.

R. L. Young

Rick Young
Project Manager

RY:vk
encl

PTS Laboratories, Inc.

Pacific Environmental Group
PTS FILE NO: 27236

PHYSICAL PROPERTIES DATA

(METHODOLOGY: ASTM D2216, API RP40, EPA 9100, WALKLEY-BLACK)

PROJECT NAME: Unocal Station 5430
PROJECT NO: 311-038.1D

SAMPLE ID.	DEPTH, ft.	SAMPLE ORIENT. (1)	MOISTURE CONTENT (% wt)	DENSITY		EFFECTIVE POROSITY, % Vb	TOTAL ORGANIC CARBON mg/kg	SOIL pH	25.0 PSI CONFINING STRESS	
				BULK (g/cc)	GRAIN (g/cc)				NATIVE STATE EFFECTIVE PERMEABILITY TO WATER (millidarcy)	NATIVE STATE EFFECTIVE WATER CONDUCTIVITY (cm/s)
B-1	5.5-6	V	11.7	1.50	2.64	43.3	1400	6.11	3.06	3.18E-06
B-1	15-16.5	V	5.8	1.45	2.57	43.6	1150	7.06	704	7.32E-04
B-1	20.5-21	V	17.4	1.78	2.62	32.2	450	6.82	0.813	8.45E-07
B-1	26-26.5	V	17.6	1.80	2.63	31.6	160	6.84	0.432	4.49E-07

(1) Sample Orientation: H = Horizontal; V = Vertical

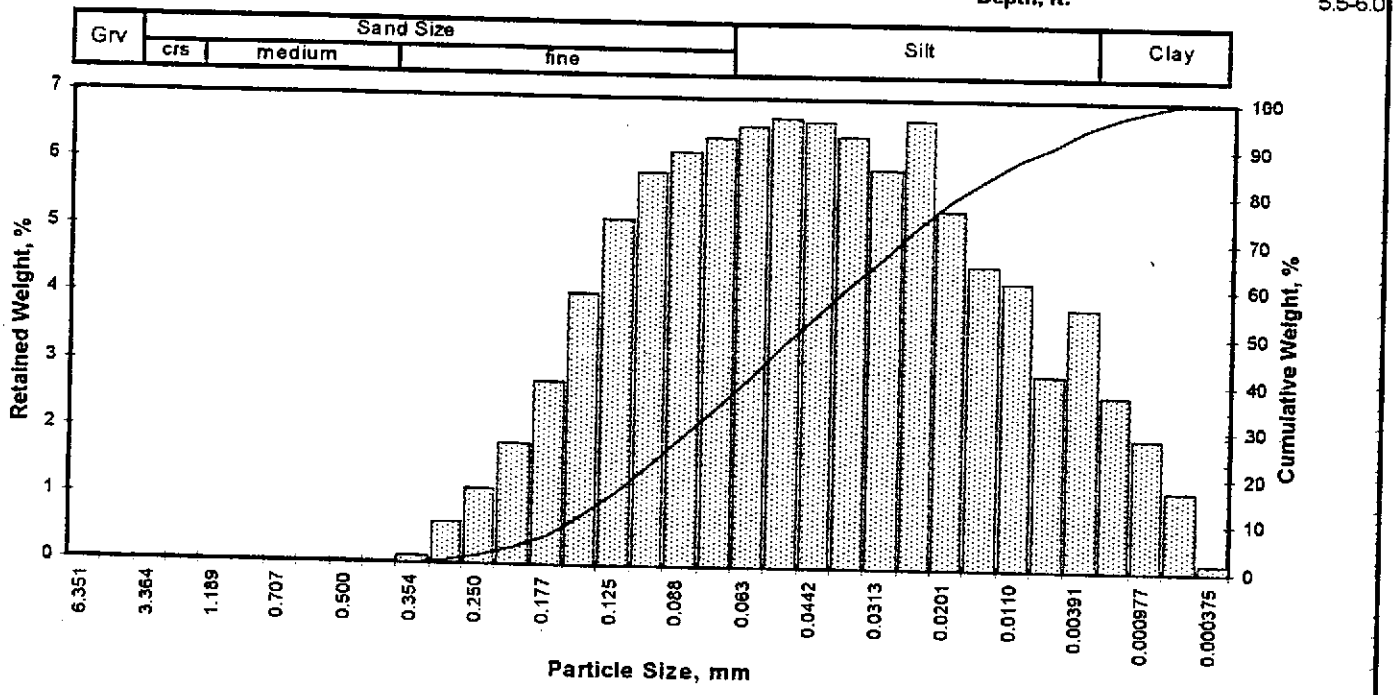
Vb = Bulk Volume, cc
Pv = Pore Volume, cc
ND = Not Detected

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client: Pacific Environmental Group
Project: Unocal Station 5430
Project No: 311-038.1D

PTS File No: 27236
Sample ID: B-1
Depth, ft: 5.5-6.0



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00
0.0197	0.500	1.00	35	0.00	0.00
0.0166	0.420	1.25	40	0.01	0.01
0.0139	0.354	1.50	45	0.10	0.10
0.0117	0.297	1.75	50	0.60	0.70
0.0098	0.250	2.00	60	1.11	1.81
0.0083	0.210	2.25	70	1.79	3.60
0.0070	0.177	2.50	80	2.73	6.33
0.0059	0.149	2.75	100	4.05	10.38
0.0049	0.125	3.00	120	5.17	15.55
0.0041	0.105	3.25	140	5.88	21.43
0.0035	0.088	3.50	170	6.20	27.63
0.0029	0.074	3.75	200	6.41	34.04
0.0025	0.063	4.00	230	6.59	40.63
0.0021	0.053	4.25	270	6.73	47.36
0.00174	0.0442	4.50	325	6.68	54.04
0.00146	0.0372	4.75	400	6.43	60.47
0.00123	0.0313	5.00	450	5.95	66.42
0.000986	0.0250	5.32	500	6.69	73.11
0.000790	0.0201	5.64	635	5.35	78.46
0.000615	0.0156	6.00		4.54	83.00
0.000435	0.0110	6.50		4.28	87.28
0.000308	0.00781	7.00		2.92	90.20
0.000154	0.00391	8.00		3.90	94.10
0.000077	0.00195	9.00		2.61	96.71
0.000038	0.000977	10.00		1.99	98.70
0.000019	0.000488	11.00		1.18	99.88
0.000015	0.000375	11.38		0.12	100.00
TOTALS				100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Inches	Millimeters
5	2.38	0.0076	0.192
10	2.73	0.0059	0.151
16	3.02	0.0049	0.123
25	3.39	0.0037	0.095
40	3.98	0.0025	0.064
50	4.35	0.0019	0.049
60	4.73	0.0015	0.038
75	5.43	0.0009	0.023
84	6.12	0.0006	0.014
90	6.97	0.0003	0.008
95	8.35	0.0001	0.003

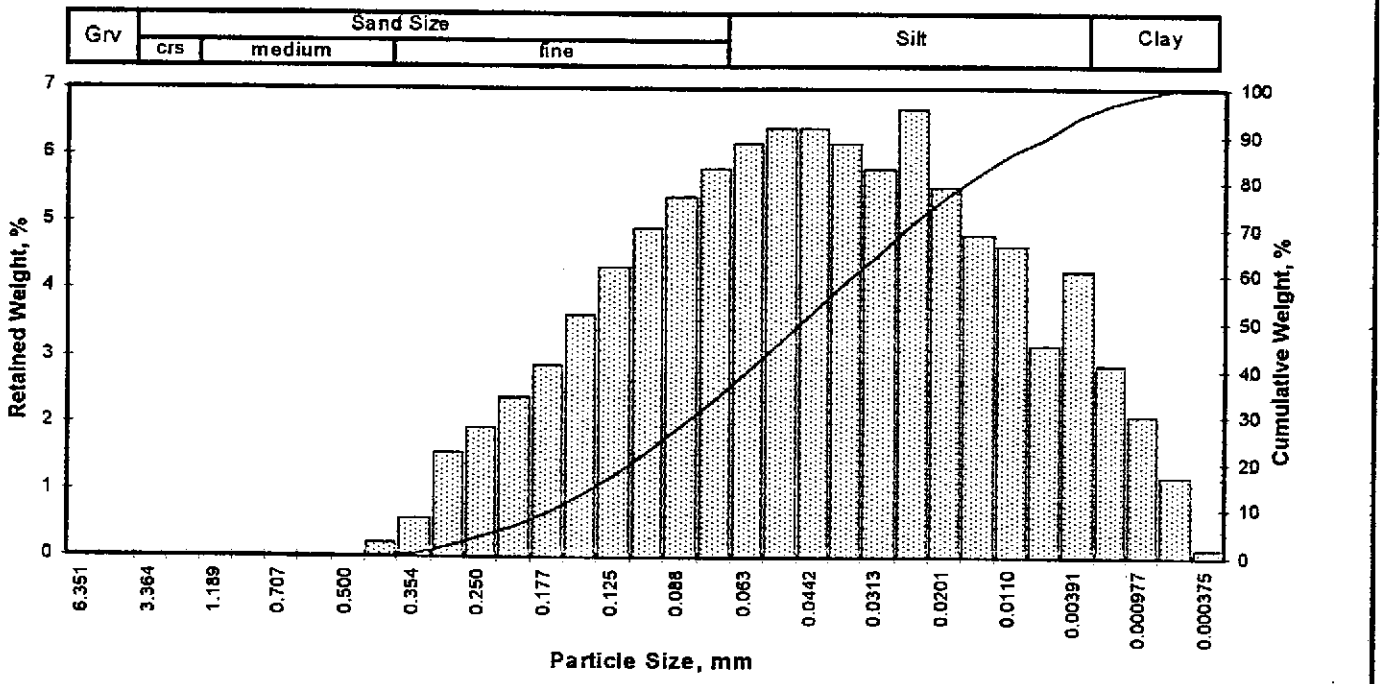
Measure	Trask	Inman	Folk-Ward
Median, phi	4.35	4.35	4.35
Median, in.	0.0019	0.0019	0.0019
Median, mm	0.049	0.049	0.049
Mean, phi	4.08	4.57	4.49
Mean, in.	0.0023	0.0017	0.0017
Mean, mm	0.059	0.042	0.044
Sorting	0.493	1.549	1.679
Skewness	0.956	0.142	0.241
Kurtosis	0.252	0.926	1.199
Grain Size Description (Wentworth scale)		Silt (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.01
Fine Sand	200	34.03
Silt	.00391 mm	60.06
Clay	<.00391 mm	5.90
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client:	Pacific Environmental Group	**PTS File No:**	27236
Project:	Unocal Station 5430	**Sample ID:**	B-1
Project No:	311-038.1D	**Depth, ft:**	20.5-21.0



Opening (inches)	Opening (Millimeters)	Phi of Screen	U.S. No.	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00
0.0468	1.189	-0.25	16	0.00	0.00
0.0331	0.841	0.25	20	0.00	0.00
0.0278	0.707	0.50	25	0.00	0.00
0.0234	0.595	0.75	30	0.00	0.00
0.0197	0.500	1.00	35	0.01	0.01
0.0166	0.420	1.25	40	0.19	0.20
0.0139	0.354	1.50	45	0.56	0.76
0.0117	0.297	1.75	50	1.56	2.32
0.0098	0.250	2.00	60	1.94	4.26
0.0083	0.210	2.25	70	2.38	6.64
0.0070	0.177	2.50	80	2.87	9.51
0.0059	0.149	2.75	100	3.62	13.13
0.0049	0.125	3.00	120	4.34	17.47
0.0041	0.105	3.25	140	4.93	22.39
0.0035	0.088	3.50	170	5.37	27.76
0.0029	0.074	3.75	200	5.80	33.56
0.0025	0.063	4.00	230	6.18	39.74
0.0021	0.053	4.25	270	6.41	46.15
0.00174	0.0442	4.50	325	6.41	52.56
0.00146	0.0372	4.75	400	6.20	58.76
0.00123	0.0313	5.00	450	5.81	64.56
0.000986	0.0250	5.32	500	6.70	71.26
0.000790	0.0201	5.64	635	5.54	76.80
0.000615	0.0156	6.00		4.83	81.63
0.000435	0.0110	6.50		4.64	86.27
0.000308	0.00781	7.00		3.18	89.45
0.000154	0.00391	8.00		4.26	93.71
0.000077	0.00195	9.00		2.86	96.57
0.000038	0.000977	10.00		2.11	98.68
0.000019	0.000488	11.00		1.20	99.88
0.000015	0.000375	11.38		0.12	100.00
TOTALS				100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Inches	Millimeters
5	2.08	0.0093	0.237
10	2.53	0.0068	0.173
16	2.92	0.0052	0.133
25	3.37	0.0038	0.097
40	4.01	0.0024	0.062
50	4.40	0.0019	0.047
60	4.80	0.0014	0.036
75	5.54	0.0008	0.022
84	6.26	0.0005	0.013
90	7.13	0.0003	0.007
95	8.45	0.0001	0.003

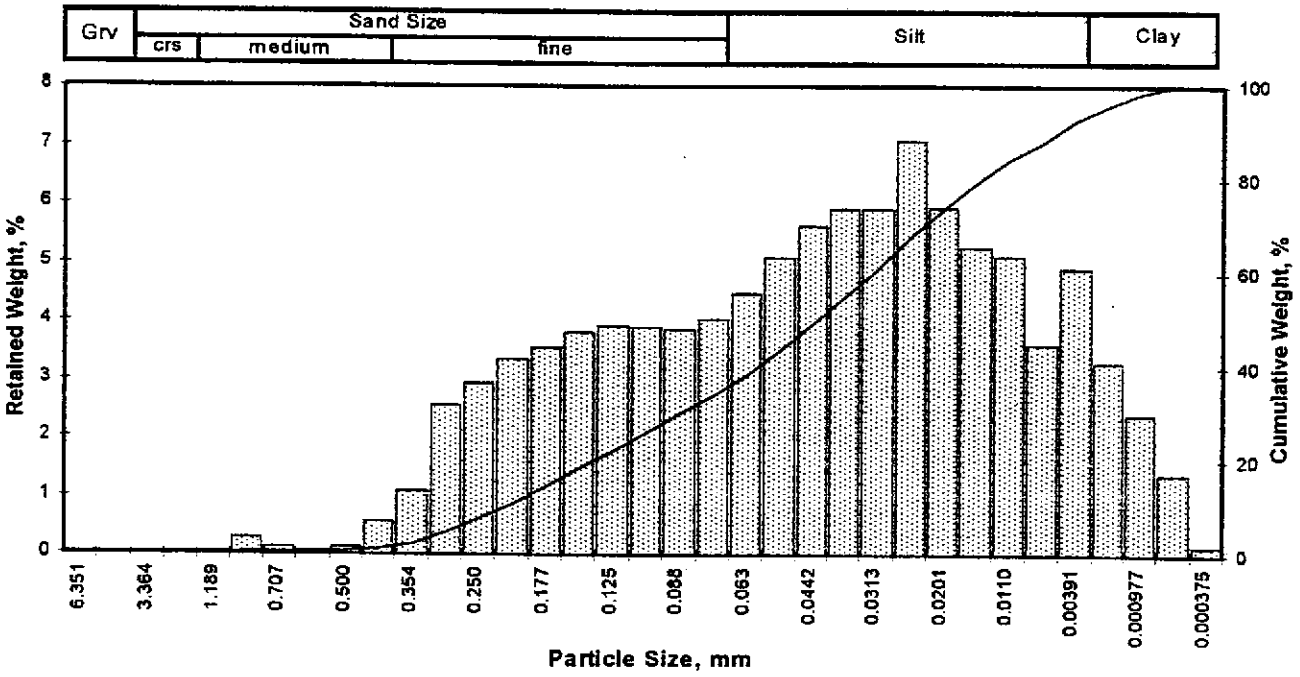
Measure	Trask	Inman	Folk-Ward
Median, phi	4.40	4.40	4.40
Median, in.	0.0019	0.0019	0.0019
Median, mm	0.047	0.047	0.047
Mean, phi	4.08	4.59	4.52
Mean, in.	0.0023	0.0016	0.0017
Mean, mm	0.059	0.042	0.043
Sorting	0.472	1.670	1.801
Skewness	0.964	0.111	0.191
Kurtosis	0.227	0.908	1.207
Grain Size Description (Wentworth scale)		Silt (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	0.20
Fine Sand	200	33.36
Silt	.00391 mm	60.15
Clay	<.00391 mm	6.29
	Total	100

PTS Laboratories, Inc.

Particle Size Analysis - ASTM D4464M

Client:	Pacific Environmental Group	**PTS File No:**	27236
Project:	Unocal Station 5430	**Sample ID:**	B-1
Project No:	311-038.1D	**Depth, ft:**	26.0-26.5



Opening (Inches)	Opening (Millimeters)	Phi of Screen	U.S. No.	Incremental Weight, percent	Cumulative Weight, percent
0.2500	6.351	-2.67	1/4	0.00	0.00
0.1873	4.757	-2.25	4	0.00	0.00
0.1324	3.364	-1.75	6	0.00	0.00
0.0787	2.000	-1.00	10	0.00	0.00
0.0468	1.189	-0.25	16	0.02	0.02
0.0331	0.841	0.25	20	0.28	0.30
0.0278	0.707	0.50	25	0.11	0.41
0.0234	0.595	0.75	30	0.05	0.46
0.0197	0.500	1.00	35	0.12	0.57
0.0166	0.420	1.25	40	0.54	1.11
0.0139	0.354	1.50	45	1.06	2.17
0.0117	0.297	1.75	50	2.55	4.72
0.0098	0.250	2.00	60	2.93	7.65
0.0083	0.210	2.25	70	3.32	10.97
0.0070	0.177	2.50	80	3.54	14.52
0.0059	0.149	2.75	100	3.80	18.32
0.0049	0.125	3.00	120	3.91	22.23
0.0041	0.105	3.25	140	3.89	26.12
0.0035	0.088	3.50	170	3.85	29.97
0.0029	0.074	3.75	200	4.03	34.00
0.0025	0.063	4.00	230	4.47	38.47
0.0021	0.053	4.25	270	5.07	43.54
0.00174	0.0442	4.50	325	5.61	49.15
0.00146	0.0372	4.75	400	5.92	55.07
0.00123	0.0313	5.00	450	5.90	60.97
0.000986	0.0250	5.32	500	7.06	68.03
0.000790	0.0201	5.64	635	5.95	73.99
0.000615	0.0156	6.00		5.24	79.23
0.000435	0.0110	6.50		5.11	84.34
0.000308	0.00781	7.00		3.59	87.93
0.000154	0.00391	8.00		4.91	92.84
0.000077	0.00195	9.00		3.28	96.12
0.000038	0.000977	10.00		2.39	98.51
0.000019	0.000488	11.00		1.35	99.86
0.000015	0.000375	11.38		0.14	100.00
TOTALS				100.00	100.00

Cumulative Weight Percent greater than			
Weight percent	Phi Value	Inches	Millimeters
5	1.77	0.0115	0.292
10	2.18	0.0087	0.221
16	2.60	0.0065	0.165
25	3.18	0.0043	0.110
40	4.08	0.0023	0.059
50	4.54	0.0017	0.043
60	4.96	0.0013	0.032
75	5.71	0.0008	0.019
84	6.47	0.0004	0.011
90	7.42	0.0002	0.006
95	8.66	0.0001	0.002

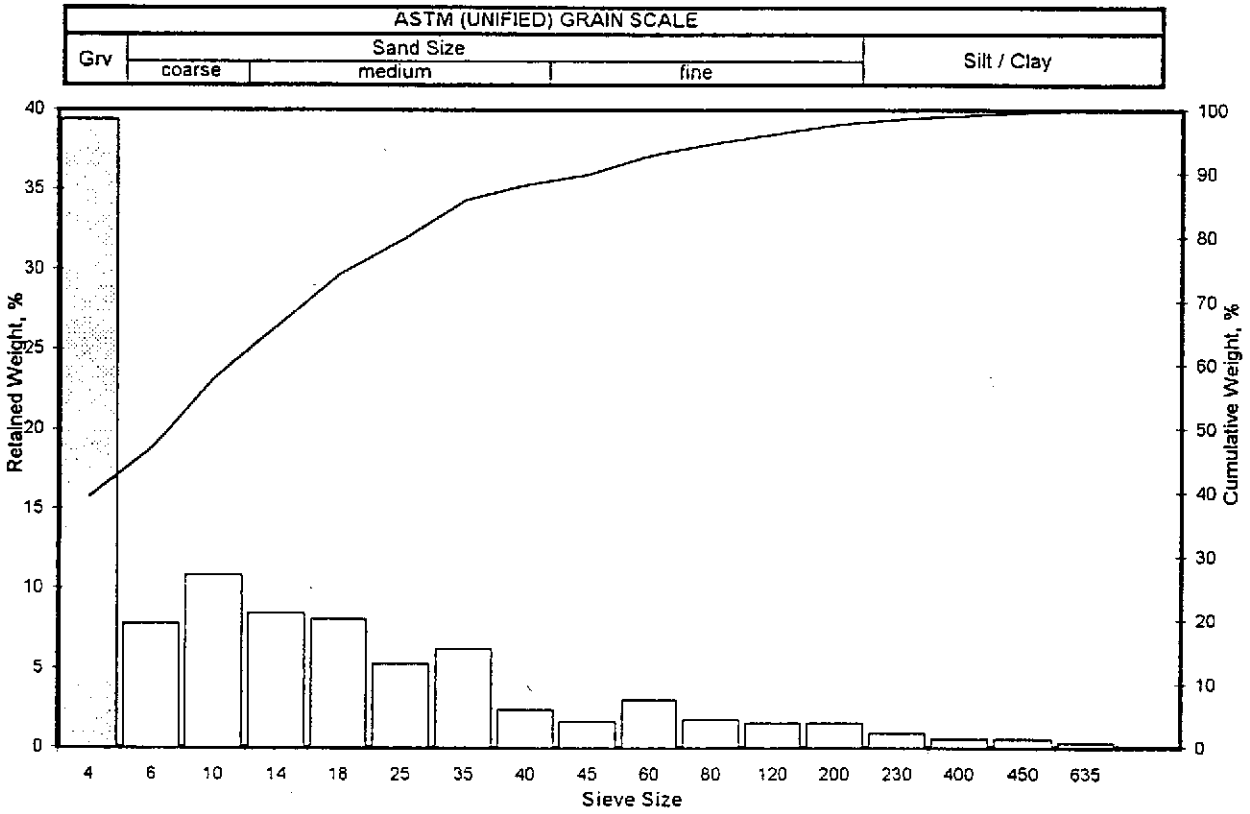
Measure	Trask	Inman	Folk-Ward
Median, phi	4.54	4.54	4.54
Median, in.	0.0017	0.0017	0.0017
Median, mm	0.043	0.043	0.043
Mean, phi	3.95	4.53	4.53
Mean, in.	0.0026	0.0017	0.0017
Mean, mm	0.065	0.043	0.043
Sorting	0.416	1.935	2.011
Skewness	1.066	-0.002	0.098
Kurtosis	0.212	0.779	1.115
Grain Size Description (Wentworth scale)		Very fine sand (based on Mean from Trask)	

Description	Retained on Sieve #	Weight Percent
Gravel	4	0.00
Coarse Sand	10	0.00
Medium Sand	40	1.11
Fine Sand	200	32.89
Silt	.00391 mm	58.84
Clay	<.00391 mm	7.16
	Total	100

PTS Laboratories, Inc.

Sieve Analysis Results - ASTM D422

Client:	Pacific Environmental Group	**PTS File No:**	27236
Project:	Unocal Station 5430	**Sample ID:**	B-1
Project No:	311-038.1D	**Depth, ft:**	15-16.5



Opening Inches	Opening Millimeters	Phi of Screen	U.S. No.	Sample Weight, grams	Retained Weight, percent	Cumulative Weight, percent
0.1873	4.757	-2.25	4	5.39	39.37	39.37
0.1279	3.249	-1.70	6	1.06	7.74	47.11
0.0787	2.000	-1.00	10	1.48	10.81	57.93
0.0557	1.414	-0.50	14	1.15	8.40	66.33
0.0394	1.000	0.00	18	1.10	8.04	74.36
0.0278	0.707	0.50	25	0.72	5.26	79.62
0.0197	0.500	1.00	35	0.85	6.21	85.83
0.0166	0.420	1.25	40	0.33	2.41	88.24
0.0139	0.354	1.50	45	0.22	1.61	89.85
0.0098	0.250	2.00	60	0.41	2.99	92.84
0.0070	0.177	2.50	80	0.24	1.75	94.59
0.0049	0.125	3.00	120	0.21	1.53	96.13
0.0029	0.074	3.75	200	0.21	1.53	97.66
0.0025	0.063	4.00	230	0.12	0.88	98.54
0.0015	0.037	4.75	400	0.07	0.51	99.05
0.0012	0.031	5.00	450	0.07	0.51	99.56
0.0008	0.020	5.64	635	0.04	0.29	99.85
			PAN	0.02	0.15	100.00
TOTALS				13.69	100.00	100.00

Cumulative Weight, percent	Phi Values	Inches	Millimeters
5			
10			
16			
40	-2.21	0.1616	4.612
50	-1.51	0.1124	2.854
70	-0.27	0.0475	1.207
84	0.85	0.0218	0.554
90	1.53	0.0137	0.347
95	2.63	0.0064	0.161

Measure	Trask	Inman	Folk-Ward
Median, phi	-1.51	-1.51	-1.51
Median, in.	0.1124	0.1124	0.1124
Median, mm	2.854	2.854	2.854
Mean, phi	-1.54		
Mean, in.	0.1145		
Mean, mm	2.909		
Sorting	0.512		
Skewness	0.827		
Kurtosis			

Grain Size Description (Wentworth scale)	Granules (based on Mean from Trask)

Description	Retained on Sieve #	Weight Percent
Gravel	4	39.37
Coarse Sand	10	18.55
Medium Sand	40	30.31
Fine Sand	200	9.42
Fines (silt/clay)	<200	2.34
	Total	100

DATE PTS FILE # 27236 CHAIN OF CUSTODY RECORD PAGE 1 OF 1

PTS Laboratories, Inc.
8100 Secura Way
Santa Fe Springs, CA 90670
Ph: (310) 907-3607 • Fax: (310) 907-3610

COMPANY: Pacific Environmental Grp.	PROJECT MANAGER: Joe Muzzio
PROJECT NAME: Unocal station 5430 ~~5444~~	FAX NUMBER: 408-441-7500
PROJECT NUMBER: 311-038.1D	PHONE NUMBER: 408-441-7500
SITE LOCATION: #5430 San Leandro, Ca 311-038.10	ADDRESS
SAMPLER SIGNATURE: A. Moore (Unocal - Tina Berry)	

ANALYSIS REQUEST

SAMPLE ID NUMBER	DATE	TIME	DEPTH, FT	PHYSICAL PROPERTIES PACKAGE, API RP40	MOISTURE CONTENT, ASTM D2216	POROSITY, API RP40	GRAIN DENSITY, API RP40	BULK DENSITY, ~~API RP40~~ ASTM D2937	AIR PERMEABILITY, API RP40	SPECIFIC RETENTION/YEILD ASTM D425	CATION EXCHANGE CAPACITY, EPA 9080	SOIL pH, EPA 9045	GRAIN SIZE: DRY, 400 MESH	GRAIN SIZE: WET/DRY, 20 MICRON	GRAIN SIZE: LASER, 1 MICRON + sieve	HYDRAULIC CONDUCTIVITY, EPA 9100, API RP40	TOC, ~~EPA 9060~~ Walkley Black	Permeability V- ASTM D5084	NUMBER OF SAMPLES
B-1	7/22/97	—	5.5-6.0		X	X		X				X			X		X	X	1
			15.0-16.5																
			20.5-21.0																
			26-26.5																

PO#

SPECIAL HANDLING
24 HOURS 5 DAYS
72 HOURS NORMAL
OTHER 10 day TAT

SAMPLE CONDITIONS
RECEIVED ON ICE YES/NO
SEALED YES/NO
OTHER YES/NO

COMMENTS

1. RELINQUISHED BY	2. RECEIVED BY	3. RELINQUISHED BY	4. RECEIVED BY
Audrey D Moore	Krissy Flessas	Krissy Flessas	
COMPANY: PEG	COMPANY: PEG	COMPANY: PEG	COMPANY: PTS LABS
DATE: 7/29/97 TIME: 10:00	DATE: 7/29/97 TIME: 1535	DATE: 7/29/97 TIME: 1535	DATE: 7/30/97 TIME: 10:20

(A)