PACIFIC
ENVIRONMENTAL
GROUP, INC.

February 12, 1997
Project 311-058.5A

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

Re: ***Remedial Action Performance Summary - October through December 1996***
76 Products Company Service Station 5760
376 Lewelling Boulevard at Usher Street
San Lorenzo, California

Dear Ms. Berry:

This letter presents a remedial action performance summary for the site referenced above. A process flow diagram and equipment layout are included as Figures 1 and 2. Attachment A presents the remedial performance summary which includes key operating parameters. Certified analytical reports and chain-of-custody documentation are presented as Attachment B, and field data sheets are included as Attachment C. The status of recent remedial activities is presented below.

Remedial System Performance Evaluation

- The soil vapor extraction (SVE) and dewatering system was approximately 97% operational during the current reporting period. The system was restarted on October 15, 1996 following a carbon changeout and experienced minor system operational problems throughout the remainder of the period.
- The mass removal versus time trend for the SVE system indicates a diminishing incremental benefit from continued operation of the system. The SVE system removed approximately 50 pounds TPPH-g during the first 2,000 hours of operation; only about 13 pounds of TPPH-g were removed over the subsequent 1,600 hours. Pacific Environmental Group, Inc. (PACIFIC) recommends discontinuing operation of the SVE and dewatering system, since further significant bulk mass removal does not appear feasible.

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

- To enhance intrinsic bioremediation occurring at the site, PACIFIC recommends installing ORC modules in wells U-1 and U-3 after disconnecting them from the SVE/dewatering system. Attachment D contains an assessment of Bioreclamation at the site, which finds the deployment of ORC at U-6 and U-9 to be effectively enhancing biodegradation and attenuation of the dissolved hydrocarbon plume.
- PACIFIC recommends that groundwater monitoring continue on the current semiannual schedule.

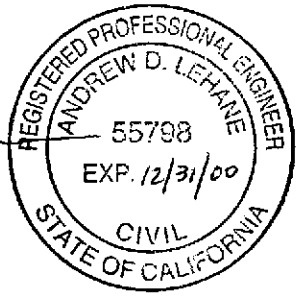
If you have any questions regarding the contents of this remedial action performance summary, please do not hesitate to call.

Sincerely,

Pacific Environmental Group, Inc.

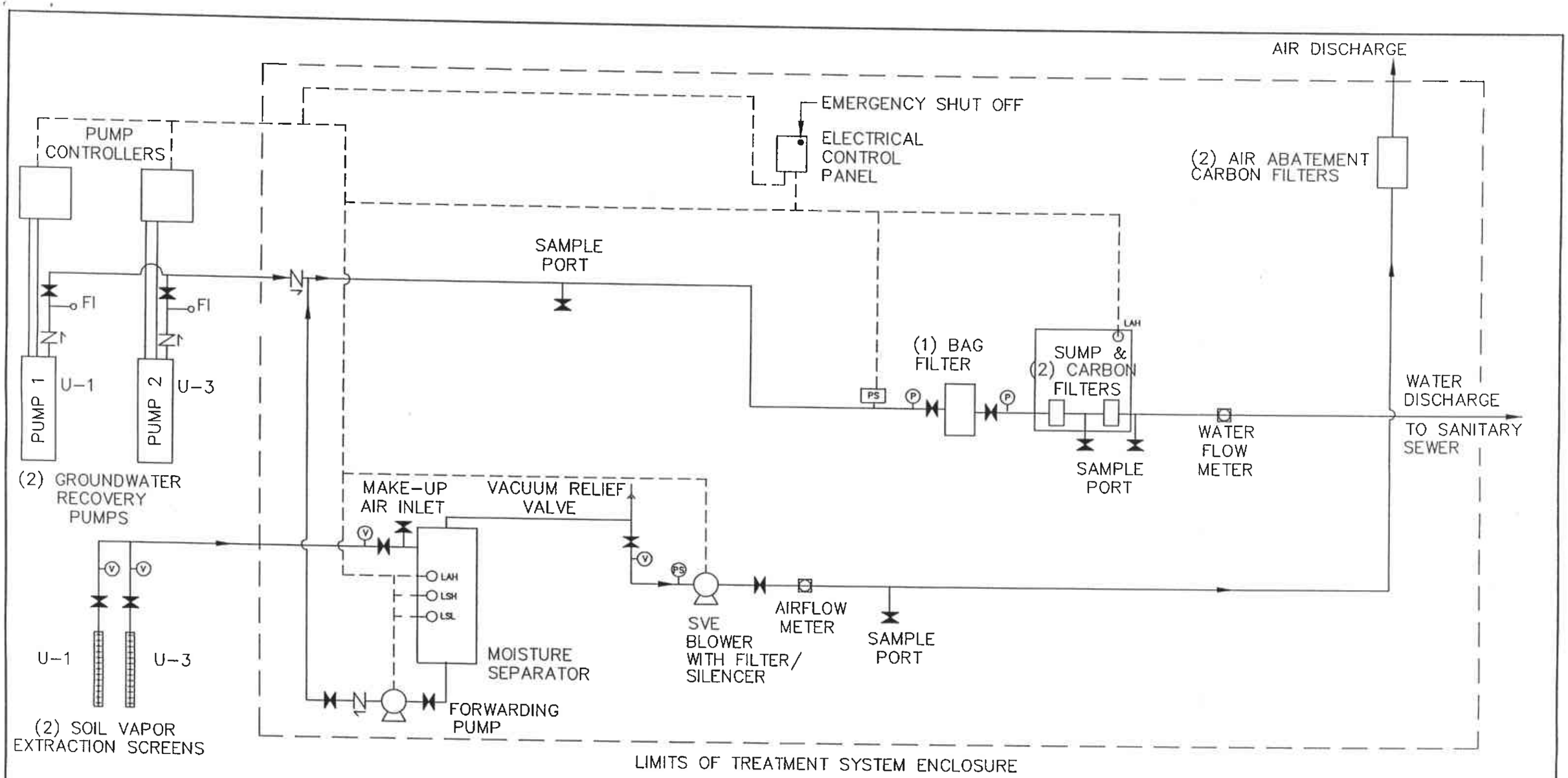
Jessica Nelligan
Staff Engineer

Andrew D. Lehane
Project Engineer
RCE 55798



Attachments:
Figure 1 - Process Flow Diagram - GWE/SVE System
Figure 2 - Equipment Layout - Plan View
Attachment A - Remedial Action Performance Summary
Attachment B - Certified Analytical Reports and Chain-of-Custody Documentation
Attachment C - Field Data Sheets
Attachment D - Bioreclamation Assessment

cc: Mr. Richard Hiett, Regional Water Quality Control Board - S.F. Bay Region
Ms. Amy Leech, Alameda County Health Care Services



NOTES:

SEE SHEET G4 FOR LEGEND TO SYMBOLS

REV #	REVISION	BY	DATE
B	Issued for permits		7-25-95
A	Issued for review		6-15-95

UNOCAL 76

CERT-G5A 1

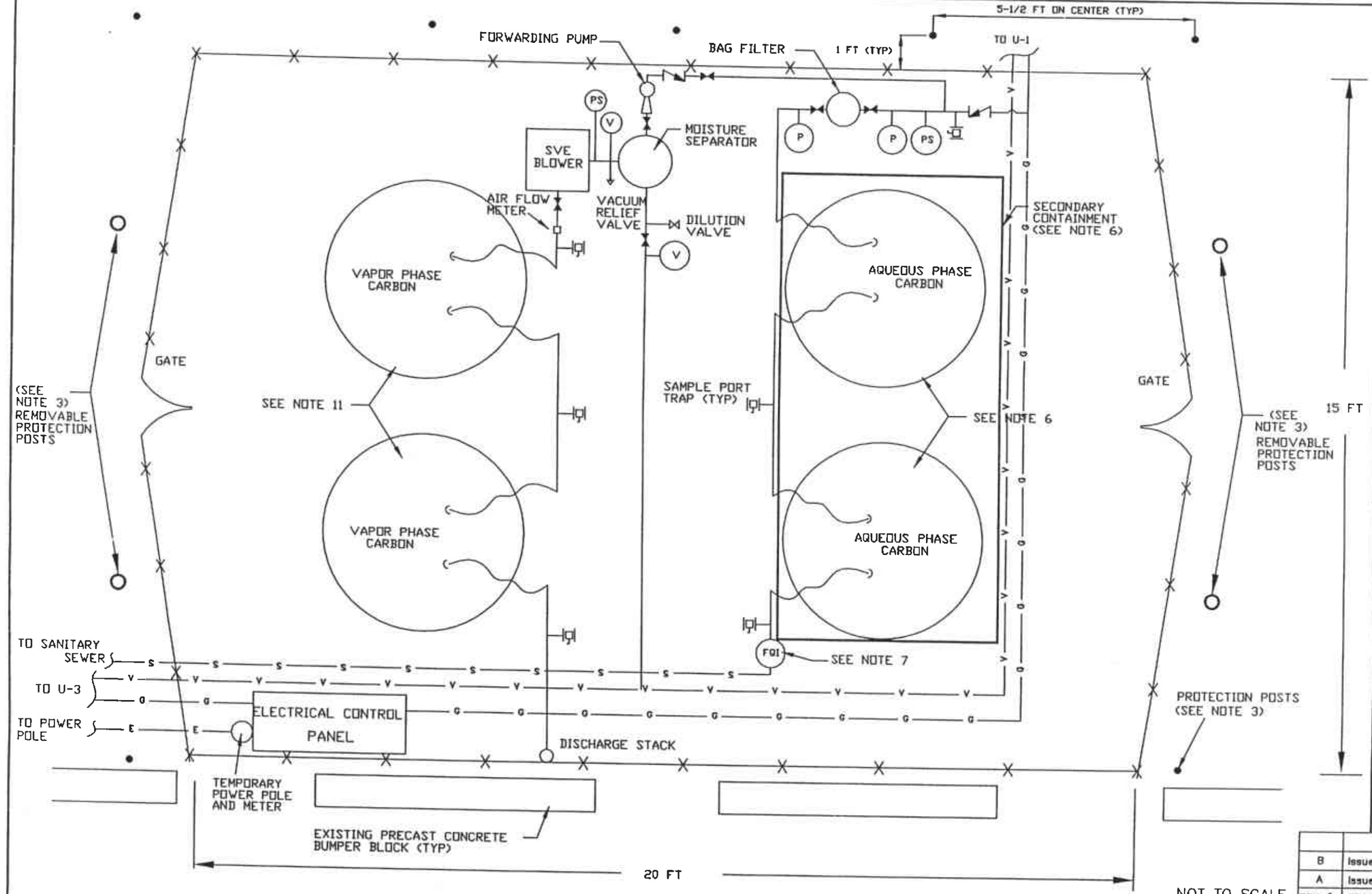
PROJECT: 310-058.3B

FACILITY: UNOCAL STATION #5760
376 Lewelling Boulevard
San Lorenzo, California

DATE: 7/26/95 SHEET 6 of 9

TITLE: PROCESS FLOW DIAGRAM
GROUNDWATER/SVE SYSTEM

DRAWING No. 5760-G5 B



NOTES:

1. CONSTRUCT EQUIPMENT ENCLOSURE ON EXISTING SURFACE.
2. CONTRACTOR TO PROVIDE APPROPRIATE ELECTRICAL SERVICE TO THE UNIT, SEE DRAWING E-1.
3. CONSTRUCT PROTECTION POSTS 5-1/2 FEET ON CENTER (TYP). SEE DETAIL 2, SHEET G-4. NUMBER OF POSTS TO VARY BASED ON EXPOSURE TO VEHICULAR TRAFFIC.

NOT TO SCALE

REV #	REVISION	BY	DATE
B	Issued for permits		7-26-95
A	Issued for review		4-13-95

UNOCAL 76

CERT-G7

1

PROJECT: 310-058.3B

FACILITY: UNOCAL STATION #5760
376 Lewelling Boulevard
San Lorenzo, California

DATE: 7/26/95

SHEET 8 of 9

TITLE:
EQUIPMENT LAYOUT PLAN VIEW

DRAWING No. 5760-G7

B

ATTACHMENT A

REMEDIAL ACTION PERFORMANCE SUMMARY

ATTACHMENT A
REMEDIAL ACTION PERFORMANCE SUMMARY: FOURTH QUARTER 1996
GROUNDWATER DEWATERING SYSTEM

Site Name: 76 Products Service Station 5760
Site Address: 376 Lewelling Boulevard, San Lorenzo, CA
Abatement Equipment: Granular-Activated Carbon Vessels
Start-Up Date: 10/18/95

Permitting Agency: Oro Loma Sanitary District
Permit No.: 024
Permit Expiration Date: 6/30/96
Estimated Shutdown Date: Unknown

REMEDIAL OBJECTIVES

- Dewatering to enhance soil vapor extraction
- Regulatory Compliance

OPERATIONAL DATA

Treatment System Data	October	November	December		
Operational Status	Re-Start†	Operational	Operational		
Groundwater Volume Pumped (gals)	49,053	54,488	47,466		Table 1 Page A-3

Treatment System Analytical Data Summary	INFLUENT	EFFLUENT	
EPA Method 8020 Analyses	Detected	Detected	Table 2 Page A-4

TPH and Benzene Summary	October	November	December		
Influent TPPH-gasoline (µg/L)	4,900	15,000	3,800		Table 1 Page A-3
Influent Benzene (µg/L)	94	130	14		Table 1 Page A-3
Effluent TPPH-gasoline (µg/L)	ND	ND	ND		Table 2 Page A-4
Effluent Benzene (µg/L)	ND	ND	ND	Cumulative	Table 2 Page A-4
Mass TPPH-gasoline Removed (lbs)	5.5	4.5	3.8	46.1	Table 1 Page A-3
Mass Benzene Removed (lbs)	0.07	0.05	0.02	0.53	Table 1 Page A-3

PERFORMANCE EVALUATION

Dewatering *The groundwater extraction (GWE) system provided sufficient dewatering to enhance soil vapor extraction.*

Regulatory Compliance *The GWE system ran in compliance with all Oro Loma Sanitary District discharge permit limitations throughout the current reporting period.*

ACTIONS/RECOMMENDATIONS

- *Discontinue operation of dewatering system during the first quarter of 1997.*

NOTES:
TPPH = Total purgeable petroleum hydrocarbons
ND = Not detected above detection limit
gals = Gallons
µg/L = Micrograms per liter
lbs = Pounds
† = System re-started following carbon replacement.
Note: When appropriate, tabulated data is followed by associated graphical presentation.

ATTACHMENT A (continued)
REMEDIAL ACTION PERFORMANCE SUMMARY: FOURTH QUARTER 1996
SOIL-BASED REMEDIAL SYSTEM

Site Name: 76 Products Service Station 5760
Site Address: 376 Lewelling Boulevard, San Lorenzo, CA
Abatement Equipment: 2-1,000 lb vapor-phase carbon cannisters
Start-Up Date: 10/18/95

Permitting Agency: BAAQMD
ATC No.: 14994
ATC Expiration Date: 10/11/97
Estimated Shutdown Date: Unknown

REMEDIAL OBJECTIVES

- Mass Removal
- Regulatory Compliance

OPERATIONAL DATA

Treatment System Data

	October	November	December	
Operational Status	Re-Start†	Operational	Operational	
Instantaneous Flow Rate (scfm)	72	28	44	Table 3 Page A-5

TPPH and Benzene Summary

	October	November	December		
Influent TPPH-gasoline (ppmv)	14	ND	13		Table 3 Page A-5
Influent Benzene (ppmv)	ND	ND	0.035		Table 3 Page A-5
Effluent TPPH-gasoline (ppmv)	1‡	2‡	4‡		Table 4 Page A-6
Effluent Benzene (ppmv)	NS	NS	NS	Cumulative	Table 4 Page A-6
Mass TPPH Removed (lbs)	4.2	5.6	3.3	63.3	Table 3 Page A-5
Mass Benzene Removed (lbs)	0.01	0.02	0.01	0.46	Table 3 Page A-5

REMEDIAL ACTION PERFORMANCE EVALUATION

Mass Removal *Approximately 13 pounds of TPPH as Gasoline and 0.05 pound of benzene were removed by the SVE treatment system during the current reporting period.*

Regulatory Compliance *The SVE system operated in full compliance with all BAAQMD permit conditions throughout the current reporting period.*

ACTIONS/RECOMMENDATIONS

- *Discontinue operation of the SVE system during the first quarter of 1997.*

NOTES:
ND = Not detected above detection limit
NS = Not sampled
† = SVE system re-started following carbon replacement to GWE system.
‡ = Concentration measured using field instruments
scfm = Standard cubic feet per minute
ppmv = Parts per million by volume
lbs = Pounds
Note: When appropriate, tabulated data is followed by associated graphical presentation.

Table 1

Groundwater Extraction System Performance Data

76 Products Service Station 5760
376 Lewelling Boulevard at Usher Street
San Lorenzo, California

Sample ID	Date Sampled		Effluent Temp (deg F)	Totalizer Reading (gallons)	Average Flow Rate (gpm)	TPPH as Gasoline: Influent Concentration (µg/L)	TPPH as Gasoline: Removal Rate (lbs/day)		TPPH as Gasoline: Removed To Date (lbs)	Benzene: Influent Concentration (µg/L)	Benzene: Removal Rate (lbs/day)		Benzene: Removed To Date (lbs)
INFL	10/18/95	a	NM	76	N/A	NS	N/A		0.0	NS	N/A		0.00
INFL	10/30/95		NM	4,040	0.2	33,000	0.09		1.1	480	0.00132		0.02
INFL	11/30/95		NM	7,751	0.1	15,000	0.02		1.8	190	0.00033		0.03
INFL	12/27/95		64.2	15,031	0.2	1,100	0.02		2.3	16	0.00023		0.03
INFL	01/22/96	b	58.4	19,350	0.1	NS	0.002	c	2.4	NS	0.00002	c	0.03
INFL	02/13/96	d	70.9	28,980	0.3	32,000	0.06		3.7	460	0.00087		0.05
INFL	03/11/96	e	N/A	82,320	1.4	NS	0.27		11.0	NS	0.00392		0.16
INFL	04/05/96	f	70.7	82,660	0.01	25,000	0.003		11.1	280	0.00004		0.16
INFL	05/15/96	g	70.6	132,610	0.87	22,000	0.245		20.9	240	0.00271		0.27
INFL	07/02/96	h	74.9	142,690	N/A	22,000	0.039		22.8	230	0.00041		0.29
INFL	07/17/96	j,k	72.5	194,730	2.4	NS	0.636		32.3	NS	0.00680		0.39
INFL	10/15/96	m	61.2	243,783	N/A	4,900	0.061		37.8	94	0.00074		0.46
INFL	11/11/96		71.6	298,271	1.4	15,000	0.167		42.3	130	0.00188		0.51
INFL	12/09/96		64.7	345,737	1.2	3,800	0.133		46.1	14	0.00102		0.53

REPORTING PERIOD:	**09/30/96 - 12/09/96 (m)**
TOTAL GALLONS EXTRACTED:	**346,661**
PERIOD GALLONS EXTRACTED:	**151,007**
TOTAL POUNDS TPPH-GASOLINE REMOVED:	**46.1**
TOTAL GALLONS TPPH-GASOLINE REMOVED:	**7.5**
TOTAL POUNDS BENZENE REMOVED:	**0.53**
TOTAL GALLONS BENZENE REMOVED:	**0.07**
PERIOD POUNDS TPPH-GASOLINE REMOVED:	**13.7**
PERIOD POUNDS BENZENE REMOVED:	**0.15**
AVERAGE FLOW RATE (gpm):	**1.3**

TPPH	= Total purgeable petroleum hydrocarbons
Temp	= Temperature
deg F	= Degrees Fahrenheit
gpm	= Gallons per minute
µg/L	= Parts per billion
lbs	= Pounds
NM	= Not measured
N/A	= Not available or not applicable
NS	= Not sampled (assume prior concentrations)

a. GWE system startup on October 18, 1995.
b. GWE system found down 1/17/96; pumps pulled for repair.
c. Samples not taken; prior concentrations assumed.
d. GWE Pumps U-1 and U-3 re-installed 2/13/96.
e. Systems down; carbon changeout performed 3/25/96; further repair required to bag filter housing closure assembly.
f. Carbon replacement to secondary 3/25/96; switched to primary.
g. System shut down for carbon replacement to current secondary.
h. System restarted July 2, 1996.
j. System temporarily shut down to address operational problems.
k. Carbon changeout to primary on 10/13/96; switched to secondary.
m. System re-started 10/15/96.

Assumed densities: TPPH = 6.1 lbs/gal; benzene = 7.34 lbs/gal. Net hydrocarbon removal data are approximate.
Mass removed is an approximation calculated using averaged concentrations.

Table 2
Groundwater Treatment System Analytical Data

76 Products Service Station 5760
376 Lewelling Boulevard at Usher Street
San Lorenzo, California

Date Sampled	TPPH (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-benzene (µg/L)	Xylenes (µg/L)	Permit Compliance Parameters COD (mg/L)	TSS (mg/L)	pH (units)
Influent Samples								
10/30/95	33,000	480	1,400	900	7,100	N/A	N/A	N/A
11/30/95	15,000	190	310	210	3,700	N/A	N/A	N/A
12/27/95	1,100	16	23	<2.0	300	N/A	N/A	N/A
02/13/96 b	32,000	460	1,100	1,500	7,700	N/A	N/A	N/A
04/05/96	25,000	280	1,400	900	6,400	N/A	N/A	N/A
05/15/96	22,000	240	1,200	850	4,700	N/A	N/A	N/A
07/02/96	22,000	230	1,300	950	4,700	N/A	N/A	N/A
10/15/96 e	4,900	94	14	210	1,600	N/A	N/A	N/A
11/11/96	15,000	130	560	550	4,500	N/A	N/A	N/A
12/09/96	3,800	14	<5.0	10	800	N/A	N/A	N/A
Effluent Samples								
10/04/95	<50	<0.50	<0.50	<0.50	<0.50	<20	<1.0	8.89 a
10/30/95	<50	<0.50	<0.50	<0.50	<0.50	NS	NS	NS
11/30/95	<50	<0.50	<0.50	<0.50	<0.50	NS	NS	NS
12/27/95	<50	<0.50	<0.50	<0.50	<0.50	NS	NS	7.05 a
02/13/96 b	<50	<0.50	<0.50	<0.50	<0.50	<20	9.0	6.83 a
04/05/96 c	83	<0.50	0.80	<0.50	2.0	<20	11	6.83 a
05/15/96 c	<50	1.8	1.6	<0.50	5.8	<20	12	6.86 a
07/02/96 d	<50	<0.50	<0.50	<0.50	<0.50	15	2.0	7.09 a
10/15/96 e	<50	<0.50	<0.50	<0.50	0.54	NS	NS	8.74 a
11/11/96	<50	<0.50	<0.50	<0.50	<0.50	NS	NS	7.55 a
11/27/96	<50	<0.50	<0.50	<0.50	<0.50	<20	<1.0	7.2
12/09/96	<50	<0.50	<0.50	<0.50	<0.50	NS	NS	6.92 a

TPPH = Total purgeable petroleum hydrocarbons
COD = Chemical oxygen demand
TSS = Total suspended solids
µg/L = Micrograms per liter
mg/L = Milligrams per liter
N/A = Not applicable
NS = Not sampled
< = Denotes any potential concentrations fell below the shown detection limit for the analysis.

a. The pH reading was measured by field instruments, not by laboratory analysis.
b. GWE system was found down 1/17/96 and two pumps were pulled for repair and replaced 2/13/96.
c. Carbon replacement of primary on 3/25/96 (switched to secondary); new primary replaced in May.
d. System restarted July 2, 1996; de-activated July 17 to schedule carbon replacement to current primary.
e. System restarted 10/15/96 following carbon changeout.

Table 3

Soil Vapor Extraction System Performance Data

76 Products Service Station 5760
376 Lewelling Boulevard at Usher Street
San Lorenzo, California

Sample ID	Date Sampled	Days Operational (t)	Hourmeter Reading (hours)	Flow Rate (scfm)	TPPH as Gasoline: Influent Concentration (ppmv)	TPPH as Gasoline: Removal Rate (lbs/day)	TPPH as Gasoline: Removed To Date (lbs)	Benzene: Influent Concentration (ppmv)	Benzene: Removal Rate (lbs/day)	Benzene: Removed To Date (lbs)
INFL	10/18/95 a	0.0	0.00	40	87	1.33	0.0	0.95	0.012	0.00
INFL	10/19/95	0.2	5.50	40	149	2.26	0.4	2.4	0.030	0.00
INFL	10/20/95	1.2	33.95	55	45	0.94	2.3	0.49	0.008	0.03
INFL	11/30/95	37.2	927.30	40	38	0.58	30.5	0.24	0.003	0.24
INFL	12/27/95	27.1	1,576.71	34	ND	0.00	38.3	0.04	0.000	0.28
INFL	01/22/96	3.4	1,659.50	29	31	0.34	38.9	0.40	0.004	0.29
INFL	02/13/96 b	6.7	1,820.86	54	52	1.07	43.6	0.69	0.012	0.34
INFL	04/05/96	3.8	1,912.90	71	26	0.70	47.0	0.40	0.009	0.38
INFL	05/15/96 c	5.3	2,039.58	52	26	0.51	50.2	0.21	0.003	0.41
INFL	07/02/96 d	0.1	2,042.00	72	13	0.34	50.2	0.06	0.001	0.42
INFL	10/15/96 e	11.4	2,316.00	72	14	0.39	54.4	ND	0.001	0.43
INFL	11/11/96	27.2	2,969.00	28	ND	0.03	60.0	ND	0.0003	0.45
INFL	12/09/96	25.9	3,590.26	44	13	0.23	63.3	0.035	0.0005	0.46

REPORTING PERIOD:	**09/30/96 - 12/09/96 (e)**
TOTAL DAYS OF OPERATION	**149.6**
PERIOD DAYS OF OPERATION	**64.5**
TOTAL POUNDS TPPH-GASOLINE REMOVED:	**63.3**
TOTAL GALLONS TPPH-GASOLINE REMOVED:	**10.4**
TOTAL POUNDS BENZENE REMOVED:	**0.46**
TOTAL GALLONS BENZENE REMOVED:	**0.06**
PERIOD POUNDS TPPH-GASOLINE REMOVED:	**13.0**
PERIOD POUNDS BENZENE REMOVED:	**0.05**
PERIOD AVERAGE FLOW RATE (scfm):	**48**
PERIOD PERCENT OPERATIONAL:	**97%**

TPPH = Total purgeable petroleum hydrocarbons	a. SVE system start-up on October 18, 1995 (carbon)
t = Time of period since last sampling	b. SVE system down during March 1996.
scfm = Standard cubic feet per minute	c. System left down for repairs/adjustments.
ppmv = Parts per million by volume	d. System re-started on July 2, 1996; left down 7/17/96.
lbs = Pounds	e. System re-started 10/15/96 following carbon changeout to GWE system

Assume density of gasoline = 6.1 lbs/gallon and density of benzene = 7.34 lbs/gallon.
Mass removed to date is calculated using averaged mass removal rates, which are based on instantaneous data.
Mass removal calculations use blower hourmeter readings to estimate run time.

Table 4
Soil Vapor Extraction System FID Data

76 Products Service Station 5760
376 Lewelling Boulevard at Usher Street
San Lorenzo, California

Date Sampled	Flow Rate (scfm)	FID Data System Influent (ppmv)	System MidPoint (ppmv)	System Effluent (ppmv)	Destruction Efficiency (percent)	Emission Rate (lbs/day)
11/30/95	40	125	30	30	76	0.37
12/08/95	45	9	N/A	16	N/A	0.22
12/27/95	34	6	8	10	N/A	0.11
01/11/96	83	50	N/A	75	N/A	1.95
01/22/96	29	18	7	7	61	0.06
02/13/96	54	140	106	40	71	0.67
02/27/96	83	175	80	100	43	2.59
04/05/96	71	110	62	90	18	2.00
05/15/96	52	150	85	105	30	2.08
07/02/96	72	50	ND	ND	100	N/A
07/17/96	72	11	N/A	N/A	N/A	N/A
10/15/96	72	ND	ND	1	N/A	0.02
11/11/96	28	4	2	2	50	0.02
12/09/96	44	13 a	4	4	69	0.05

FID = Flame-ionization detector; used to measure hydrocarbon concentrations
scfm = Standard cubic feet per minute
ppmv = Parts per million by volume, converted from micrograms per liter
lbs = Pounds
ND = Not detected above detection limit
N/A = Not available or not applicable
a. Laboratory analytical result used in place of FID reading.
Destruction efficiency [%] = [(1 - (effluent concentration/influent concentration) * 100)]

Figure 1
Groundwater Extraction System Mass Removal Trend

76 Products Service Station 5760
376 Lewelling Boulvard at Usher Street
San Lorenzo, California

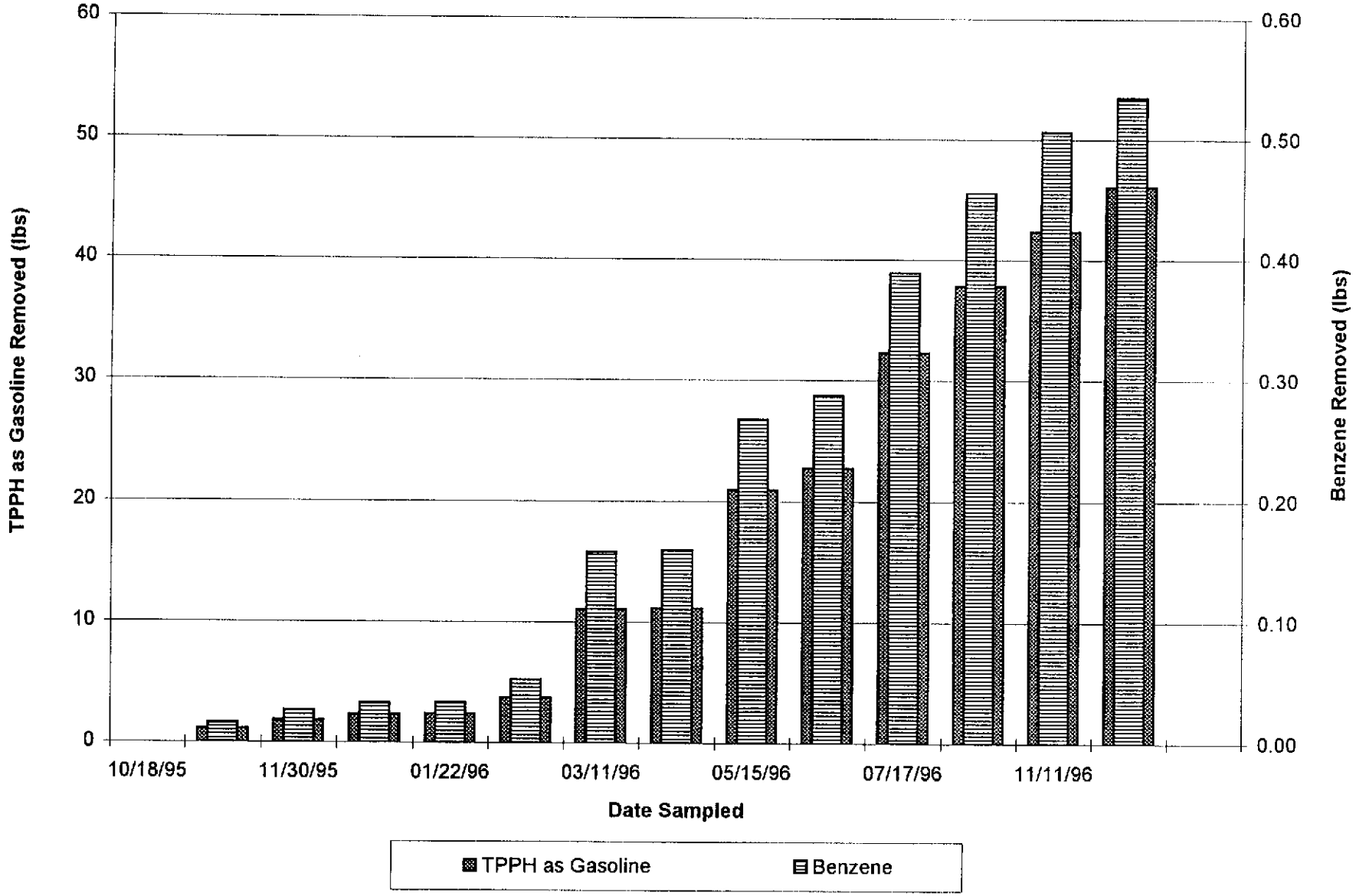


Figure 2
Groundwater Extraction System Hydrocarbon Concentrations

76 Products Service Station 5760
376 Lewelling Boulvard at Usher Street
San Lorenzo, California

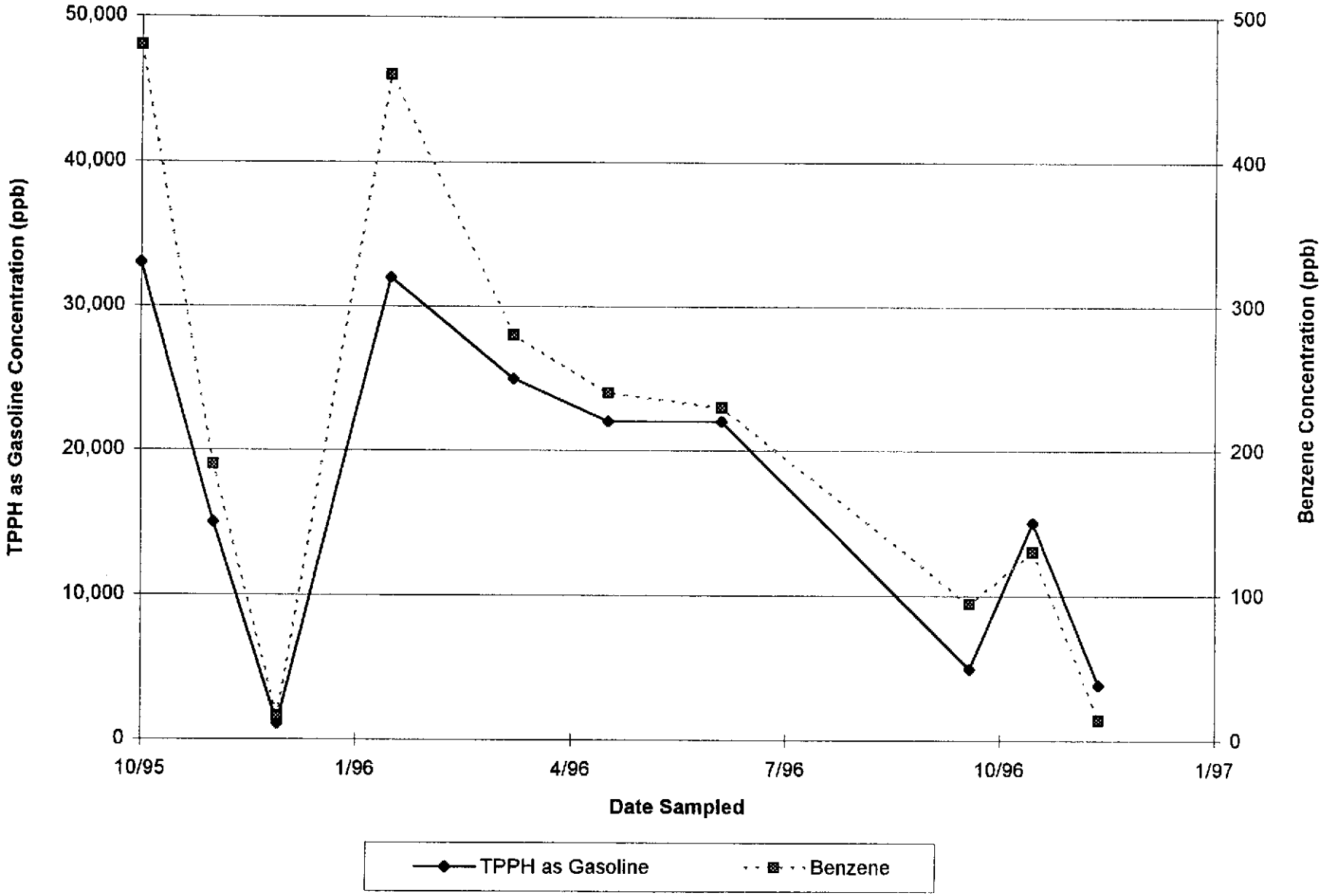


Figure 3
Soil Vapor Extraction System Mass Removal Trend

76 Products Service Station 5760
376 Lewelling Boulevard at Usher Street
San Lorenzo, California

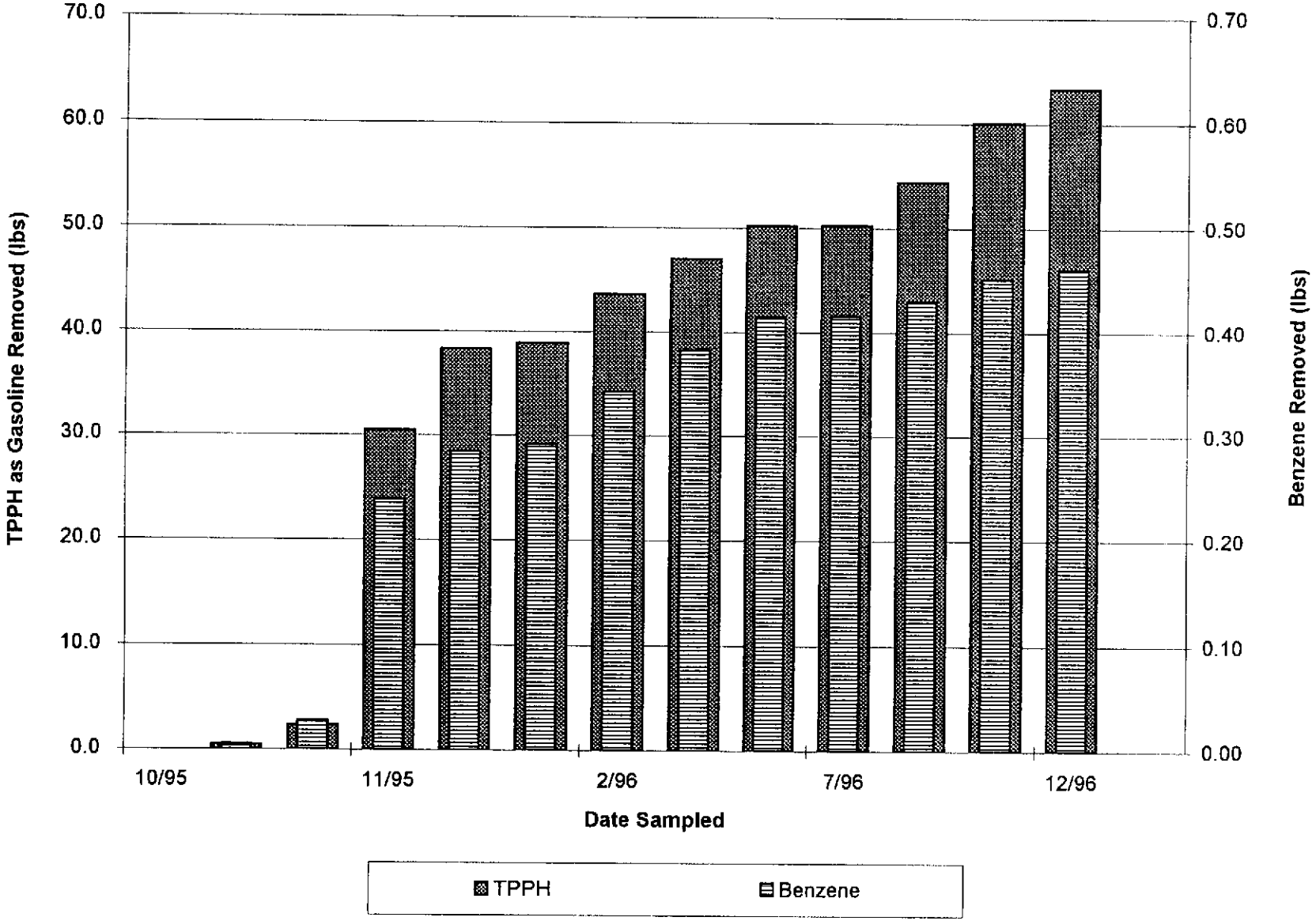


Figure 4
Soil Vapor Extraction System Hydrocarbon Concentrations

76 Products Service Station 5760
376 Lewelling Boulevard at Usher Street
San Lorenzo, California

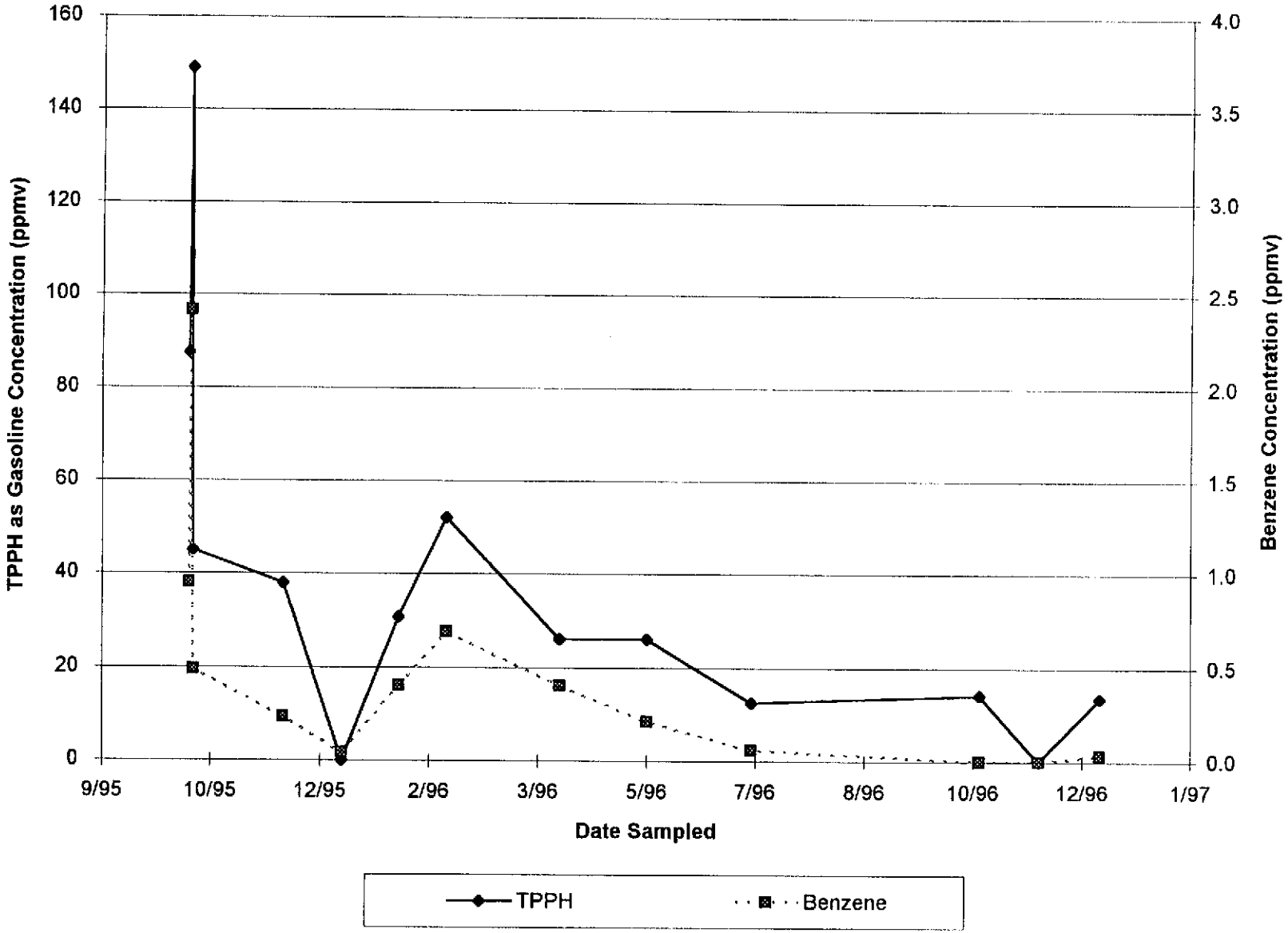
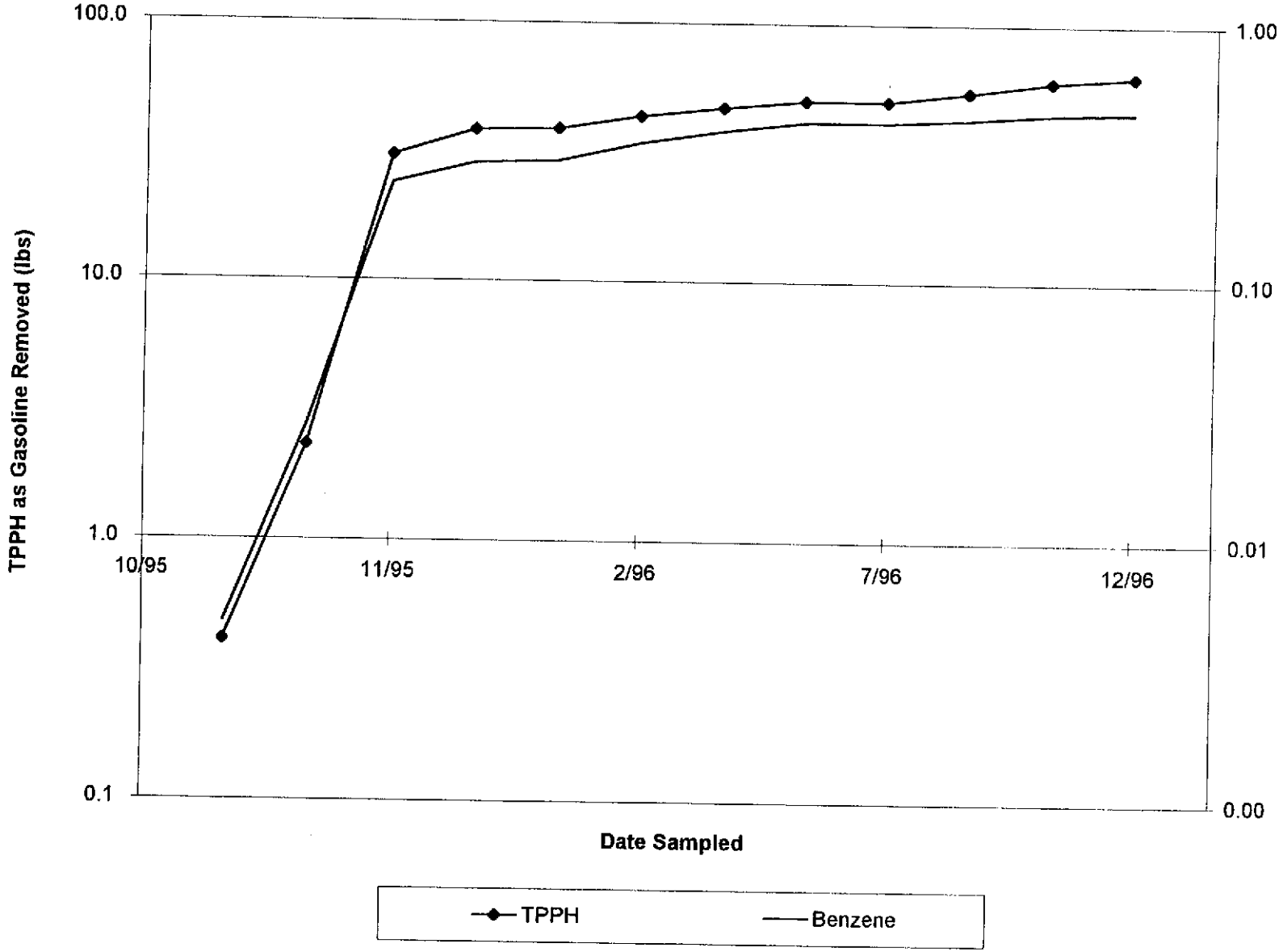


Figure 3
Soil Vapor Extraction System Mass Removal Trend

76 Products Service Station 5760
376 Lewelling Boulevard at Usher Street
San Lorenzo, California



ATTACHMENT B

CERTIFIED ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 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: Andrew Lahane

Client Proj. ID: 310-058.5A/5760, San Lorenzo
Sample Descript: INFL
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9610A47-01

Sampled: 10/15/96
Received: 10/16/96

Analyzed: 10/18/96
Reported: 10/24/96

QC Batch Number: GC101896BTEX01A
Instrument ID: GCHP01

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	500	4900
Benzene	5.0	94
Toluene	5.0	14
Ethyl Benzene	5.0	210
Xylenes (Total)	5.0	1600
Chromatogram Pattern:		Gas

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	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, (415) 364-9600, FAX (415) 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: Andrew Lahane

Client Proj. ID: 310-058.5A/5760, San Lorenzo
Sample Descript: EFFL
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9610A47-02

Sampled: 10/15/96
Received: 10/16/96

Analyzed: 10/21/96
Reported: 10/24/96

QC Batch Number: GC102196BTEX18A
Instrument ID: GCHP18

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	**0.50**	**0.54**
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	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

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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Jessica Nelligan

Client Project ID: 310-058.5A / 5760, San Lorenzo
Matrix: LIQUID
Work Order #: 9610A47 01, 02

Reported: Oct 28, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC101896BTEX01A	GC101896BTEX01A	GC101896BTEX01A	GC101896BTEX01A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	R. Geckler	R. Geckler	R. Geckler	R. Geckler
MS/MSD #:	961081109	961081109	961081109	961081109
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	10/18/96	10/18/96	10/18/96	10/18/96
Analyzed Date:	10/18/96	10/18/96	10/18/96	10/18/96
Instrument I.D.#:	GCHP1	GCHP1	GCHP1	GCHP1
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	10	10	9.9	30
MS % Recovery:	100	100	99	100
Dup. Result:	10	9.8	9.7	29
MSD % Recov.:	100	98	97	97
RPD:	0.0	2.0	2.0	3.4
RPD Limit:	0-25	0-25	0-25	0-25
LCS #:	BLK101896	BLK101896	BLK101896	BLK101896
Prepared Date:	10/18/96	10/18/96	10/18/96	10/18/96
Analyzed Date:	10/18/96	10/18/96	10/18/96	10/18/96
Instrument I.D.#:	GCHP1	GCHP1	GCHP1	GCHP1
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	9.1	8.8	8.7	26
LCS % Recov.:	91	88	87	87
MS/MSD Control Limits	60-140	60-140	60-140	60-140
LCS Control Limits	70-130	70-130	70-130	70-130

SEQUOIA ANALYTICAL

Tod Granicher
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS=Matrix Spike, MSD=MS Duplicate, RPD=Relative % Difference

Sequoia Analytical

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Pacific Environmental Group	Client Project ID:	310-058.5A / 5760, San Lorenzo	
2025 Gateway Place, Suite 440	Matrix:	LIQUID	
San Jose, CA 95110			
Attention: Jessica Nelligan	Work Order #:	9610A47 01, 02	Reported: Oct 28, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC102196BTEX18A	GC102196BTEX18A	GC102196BTEX18A	GC102196BTEX18A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	R. Geckler	R. Geckler	R. Geckler	R. Geckler
MS/MSD #:	961091602	961091602	961091602	961091602
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	10/21/96	10/21/96	10/21/96	10/21/96
Analyzed Date:	10/21/96	10/21/96	10/21/96	10/21/96
Instrument I.D.#:	GCHP18	GCHP18	GCHP18	GCHP18
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	10	9.8	9.6	29
MS % Recovery:	103	98	96	95
Dup. Result:	10	9.5	9.4	29
MSD % Recov.:	100	95	94	95
RPD:	3.0	3.1	2.1	0.0
RPD Limit:	0-25	0-25	0-25	0-25
LCS #:	BLK102196	BLK102196	BLK102196	BLK102196
Prepared Date:	10/21/96	10/21/96	10/21/96	10/21/96
Analyzed Date:	10/21/96	10/21/96	10/21/96	10/21/96
Instrument I.D.#:	GCHP18	GCHP18	GCHP18	GCHP18
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	12	11	10	32
LCS % Recov.:	120	109	104	108
MS/MSD Control Limits	60-140	60-140	60-140	60-140
LCS Control Limits	70-130	70-130	70-130	70-130

SEQUOIA ANALYTICAL

Tod Granicher
Project Manager

Please Note:
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** MS=Matrix Spike, MSD=MS Duplicate, RPD=Relative % Difference

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- [ ] 404 N. Wigel Lane • Walnut Creek, CA 94598 • (510) 988-9600
- [ ] 18939 120th Ave., N.E., Suite 101 • Bothell, WA 98011 • (206) 481-9200
- [ ] East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
- [ ] 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: UR, ENV. Grp.	Project Name: 310-058.5A
Address: 2025 Gateway Pl #440	UNOCAL Project Manager: Tina Berry
City: San Jose State: Ca Zip Code: 95110	AFE #:
Telephone: 408 441 7500 FAX #: 408 441 7539	Site #, City, State: 5760, San Lorenzo, Ca.
Report To: [illegible] Sampler: [illegible]	QC Data: [x] Level D (Standard) [ ] Level C [ ] Level B [ ] Level A

Turnaround Time: [x] 10 Work Days [ ] 5 Work Days [ ] 3 Work Days [ ] 2 Work Days [ ] 1 Work Day [ ] 2-8 Hours

CODE: [ ] Misc. [ ] Detect. [ ] Eval. [x] Remed. [ ] Demol. [ ] Closure

[ ] Drinking Water [x] Waste Water [x] Other air

Analyses Requested

9610A47

	Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	TPH/BTEX									Comments
1.	INFL	10/15/96	H2O	3	Voa	01	X									
2.	EFFL	10/15/96	H2O	3	Voa	02	X									
3.																
4.	INFL	10/15/96	Air	1	Bag		X									
5.																
6.																
7.																
8.																
9.																
10.																

Relinquished By: [illegible]	Date: 10/16/96	Time: 752	Received By: O. Alarcon	Date: 10/16/96	Time: 0752
Relinquished By: O. Alarcon	Date: 10/16/96	Time: 1045	Received By: [illegible]	Date: 10-16-96	Time: 1045
Relinquished By: [illegible]	Date:	Time:	Received By Lab: [illegible]	Date: 10/16/96	Time: 1155

Were Samples Received in Good Condition? [ ] Yes [ ] No Samples on Ice? [ ] Yes [ ] No Method of Shipment____ Page __ of __

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? [x] Yes [ ] No If no, what analyses are still needed?

2) Was the report issued within the requested turnaround time? [x] Yes [ ] No If no, what was the turnaround time?

Approved by: D. Alarcon Signature: O. Alarcon Company: PEG Date: 10/30/96

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 364-9233
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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: Andrew Lahane

Client Proj. ID: 310-058.5A/5760, San Lorenzo
Sample Descript: Infl
Matrix: AIR
Analysis Method: 8015Mod/8020
Lab Number: 9610973-01

Sampled: 10/15/96
Received: 10/16/96

Analyzed: 10/17/96
Reported: 10/21/96

QC Batch Number: GC101796BTEX17A
Instrument ID: GCHP17

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	**20**	**60**
Benzene	0.20	N.D.
Toluene	0.20	N.D.
Ethyl Benzene	**0.20**	**1.3**
Xylenes (Total)	**0.20**	**4.9**
Chromatogram Pattern:		**Gas**

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	127

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

Sequoia Analytical

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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Andrew Lahane

Client Project ID: 310-058.5A / 5760, San Lorenzo
Work Order #: 9610973 01
Reported: Oct 22, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC101796BTEX17A	GC101796BTEX17A	GC101796BTEX17A	GC101796BTEX17A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	Y. Arteaga	Y. Arteaga	Y. Arteaga	Y. Arteaga
MS/MSD #:	961057903	961057903	961057903	961057903
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	10/17/96	10/17/96	10/17/96	10/17/96
Analyzed Date:	10/17/96	10/17/96	10/17/96	10/17/96
Instrument I.D.#:	GCHP17	GCHP17	GCHP17	GCHP17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	11	10	9.6	29
MS % Recovery:	110	100	96	97
Dup. Result:	11	11	9.5	29
MSD % Recov.:	110	110	95	97
RPD:	0.0	9.5	1.0	0.0
RPD Limit:	0-25	0-25	0-25	0-25
LCS #:	BLK101796	BLK101796	BLK101796	BLK101796
Prepared Date:	10/17/96	10/17/96	10/17/96	10/17/96
Analyzed Date:	10/17/96	10/17/96	10/17/96	10/17/96
Instrument I.D.#:	GCHP17	GCHP17	GCHP17	GCHP17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	11	10	9.2	28
LCS % Recov.:	110	100	92	93
MS/MSD Control Limits	60-140	60-140	60-140	60-140
LCS Control Limits	70-130	70-130	70-130	70-130

SEQUOIA ANALYTICAL

Tod Granicher
Project Manager

Please Note:
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** MS=Matrix Spike, MSD=MS Duplicate, RPD=Relative % Difference

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☐ East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
☐ 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: DDC Env. Grp.	Project Name: 310-058.5A
Address: 2023 Gateway Pl #440	UNOCAL Project Manager: Tina Berry
City: San Jose State: Ca. Zip Code: 95110	AFE #:
Telephone: 408 441 7500 FAX #: 408 441 7539	Site #, City, State: 5760, San Lorenzo, Ca.
Report To: Andrea Lakarne Sampler: Mark Gabriel	QC Data: ☒ Level D (Standard) ☐ Level C ☐ Level B ☐ Level A

Turnaround Time: ☒ 10 Work Days ☐ 5 Work Days ☐ 3 Work Days ☐ 2 Work Days ☐ 1 Work Day ☐ 2-8 Hours

CODE: ☐ Misc. ☐ Detect. ☐ Eval. ☒ Remed. ☐ Demol. ☐ Closure

☐ Drinking Water ☒ Waste Water ☒ Other Air

Analyses Requested

9610973

	Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Gas/BTEX								Comments
1.	INFL	10/15/96	H2O	3	Voa		X								
2.	EFFL	10/15/96	H2O	3	Voa		X								
3.															
4.	INFL	10/15/96	Air	1	Bag	1A	X								
5.															
6.															
7.															
8.															
9.															
10.															

Relinquished By: [signature]	Date: 10/16/96	Time: 752	Received By: O. Alarcon	Date: 10/16/96	Time: 0752
Relinquished By: O. Alarcon	Date: 10/16/96	Time: 1045	Received By: Michael [illegible]	Date: 10-16-96	Time: 1045
Relinquished By: Michael [illegible]	Date:	Time:	Received By Lab: Alvod	Date: 10/16/96	Time: 1151

Were Samples Received in Good Condition? ☐ Yes ☐ No Samples on Ice? ☐ Yes ☐ No Method of Shipment______ Page __ of __

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? ☐ Yes ☐ No If no, what analyses are still needed? ______
2) Was the report issued within the requested turnaround time? ☐ Yes ☐ No If no, what was the turnaround time? ______

Approved by: ______ Signature: ______ Company: ______ Date:

Pink - Client
Yellow - Laboratory
White - Laboratory

Sequoia Analytical

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Pacific Environmental Group	Client Proj. ID: 310-058.5A/ 5760, San Lorenzo	Sampled: 11/11/96
2025 Gateway Place, Suite 440	Sample Descript: Infl	Received: 11/12/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 11/18/96
Attention: Andrew Lahane	Lab Number: 9611721-02	Reported: 11/20/96

QC Batch Number: GC111896BTEX02A
Instrument ID: GCHP2

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	2000	15000
Benzene	20	130
Toluene	20	560
Ethyl Benzene	20	550
Xylenes (Total)	20	4500
Chromatogram Pattern:		Gas

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	77

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

Sequoia Analytical

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

Attention: Andrew Lahane

Client Proj. ID: 310-058.5A/ 5760, San Lorenzo
Sample Descript: Effl
Matrix: LIQUID
Analysis Method: 8015Mod/8020
Lab Number: 9611721-01

Sampled: 11/11/96
Received: 11/12/96

Analyzed: 11/15/96
Reported: 11/20/96

QC Batch Number: GC111596BTEX21A
Instrument ID: GCHP21

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	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	92

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

Sequoia Analytical

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Pacific Environmental Group	Client Proj. ID: 310-058.5A/ 5760, San Lorenzo	Received: 11/12/96
2025 Gateway Place, Suite 440		
San Jose, CA 95110	Lab Proj. ID: 9611721	Reported: 11/20/96
Attention: Andrew Lahane		

LABORATORY NARRATIVE

In order to properly interpret this report, it must be reproduced in its entirety. This report contains a total of 7 pages including the laboratory narrative, sample results, quality control, and related documents as required (cover page, COC, raw data, etc.).

SEQUOIA ANALYTICAL

Tod Granicher
Project Manager

Sequoia Analytical

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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Andrew Lahane

Client Project ID: 310-058.5A / 5760, San Lorenzo
Matrix: LIQUID
Work Order #: 9611721 01, 02

Reported: Nov 21, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC111596BTEX21A	GC111596BTEX21A	GC111596BTEX21A	GC111596BTEX21A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	G. Fish	G. Fish	G. Fish	G. Fish
MS/MSD #:	961138812	961138812	961138812	961138812
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	11/15/96	11/15/96	11/15/96	11/15/96
Analyzed Date:	11/15/96	11/15/96	11/15/96	11/15/96
Instrument I.D.#:	GCHP21	GCHP21	GCHP21	GCHP21
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	9.4	8.8	8.9	27
MS % Recovery:	94	88	89	90
Dup. Result:	9.2	8.7	8.9	27
MSD % Recov.:	92	87	89	90
RPD:	2.2	1.1	0.0	0.0
RPD Limit:	0-25	0-25	0-25	0-25
LCS #:	BLK111596	BLK111596	BLK111596	BLK111596
Prepared Date:	11/15/96	11/15/96	11/15/96	11/15/96
Analyzed Date:	11/15/96	11/15/96	11/15/96	11/15/96
Instrument I.D.#:	GCHP21	GCHP21	GCHP21	GCHP21
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	9.4	8.7	8.9	27
LCS % Recov.:	94	87	89	90
MS/MSD Control Limits	60-140	60-140	60-140	60-140
LCS Control Limits	70-130	70-130	70-130	70-130

SEQUOIA ANALYTICAL

Tod Granicher
Project Manager

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** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

Sequoia Analytical

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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Andrew Lahane

Client Project ID: 310-058.5A / 5760, San Lorenzo
Matrix: LIQUID
Work Order #: 9611721 01, 02

Reported: Nov 21, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC111896BTEX02A	GC111896BTEX02A	GC111896BTEX02A	GC111896BTEX02A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	Y. Arteaga	Y. Arteaga	Y. Arteaga	Y. Arteaga
MS/MSD #:	961138818	961138818	961138818	961138818
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	11/18/96	11/18/96	11/18/96	11/18/96
Analyzed Date:	11/18/96	11/18/96	11/18/96	11/18/96
Instrument I.D.#:	GCHP2	GCHP2	GCHP2	GCHP2
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	10	9.3	9.0	25
MS % Recovery:	100	93	90	83
Dup. Result:	11	9.6	9.2	26
MSD % Recov.:	110	96	92	87
RPD:	9.5	3.2	2.2	3.9
RPD Limit:	0-25	0-25	0-25	0-25
LCS #:	BLK111896	BLK111896	BLK111896	BLK111896
Prepared Date:	11/18/96	11/18/96	11/18/96	11/18/96
Analyzed Date:	11/18/96	11/18/96	11/18/96	11/18/96
Instrument I.D.#:	GCHP2	GCHP2	GCHP2	GCHP2
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	11	9.8	9.4	26
LCS % Recov.:	110	98	94	87
MS/MSD Control Limits	60-140	60-140	60-140	60-140
LCS Control Limits	70-130	70-130	70-130	70-130

SEQUOIA ANALYTICAL

Tod Granicher
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

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Consultant Company:	Project Name:
Address:	UNOCAL Project Manager:
City: State: Zip Code:	AFE #:
Telephone: FAX #:	Site #, City, State:
Report To: Sampler:	QC Data: ☒ Level D (Standard) ☐ Level C ☐ Level B ☐ Level A

Turnaround Time: ☒ 10 Work Days ☐ 5 Work Days ☐ 3 Work Days ☐ 2 Work Days ☐ 1 Work Day ☐ 2-8 Hours

CODE: ☐ Misc. ☐ Detect. ☐ Eval. ☒ Remed. ☐ Demol. ☐ Closure

☐ Drinking Water ☒ Waste Water ☐ Other

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Comments
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						

Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab:	Date:	Time:

Were Samples Received in Good Condition? ☐ Yes ☐ No Samples on Ice? ☐ Yes ☐ No Method of Shipment _____ Page __ of __

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? ☐ Yes ☐ No If no, what analyses are still needed?

2) Was the report issued within the requested turnaround time? ☐ Yes ☐ No If no, what was the turnaround time?

Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client

Yellow - Laboratory

White - Laboratory

Sequoia Analytical

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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: Andrew Lahane

Client Proj. ID: Unocal 310-058.5A San Lorenzo
Sample Descript: Infl
Matrix: AIR
Analysis Method: 8015Mod/8020
Lab Number: 9611620-01

Sampled: 11/11/96
Received: 11/12/96

Analyzed: 11/13/96
Reported: 11/15/96

QC Batch Number: GC111396BTEX17A
Instrument ID: GCHP17

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	10	N.D.
Benzene	0.10	N.D.
Toluene	0.10	N.D.
Ethyl Benzene	0.10	N.D.
Xylenes (Total)	0.10	N.D.
Chromatogram Pattern:		

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	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

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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Andrew Lahane

Client Project ID: Unocal 310-058.5A, San Lorenzo

Work Order #: 9611620 01

Reported: Nov 19, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC111396BTEX17A	GC111396BTEX17A	GC111396BTEX17A	GC111396BTEX17A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	J. Heider	J. Heider	J. Heider	J. Heider
MS/MSD #:	961120804	961120804	961120804	961120804
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	11/13/96	11/13/96	11/13/96	11/13/96
Analyzed Date:	11/13/96	11/13/96	11/13/96	11/13/96
Instrument I.D.#:	GCHP17	GCHP17	GCHP17	GCHP17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	10	10	10	30
MS % Recovery:	100	100	100	100
Dup. Result:	11	11	11	32
MSD % Recov.:	110	110	110	107
RPD:	9.5	9.5	9.5	6.5
RPD Limit:	0-25	0-25	0-25	0-25
LCS #:	BLK113096	BLK113096	BLK113096	BLK113096
Prepared Date:	11/13/96	11/13/96	11/13/96	11/13/96
Analyzed Date:	11/13/96	11/13/96	11/13/96	11/13/96
Instrument I.D.#:	GCHP17	GCHP17	GCHP17	GCHP17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	10	10	9.8	29
LCS % Recov.:	100	100	98	97
MS/MSD	60-140	60-140	60-140	60-140
LCS	70-130	70-130	70-130	70-130
Control Limits				

SEQUOIA ANALYTICAL

Tod Granicher
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Andrew Lahane

Client Proj. ID: Unocal 310-058.5A San Lorenzo
Lab Proj. ID: 9611620

Received: 11/12/96
Reported: 11/15/96

LABORATORY NARRATIVE

In order to properly interpret this report, it must be reproduced in its entirety. This report contains a total of 4 pages including the laboratory narrative, sample results, quality control, and related documents as required (cover page, COC, raw data, etc.).

SEQUOIA ANALYTICAL

Tod Granicher
Project Manager

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☐ 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: PAC. ENV. GROUP, INC.	Project Name: 310-0558.51A
Address: 2025 GATEWAY PL #440	UNOCAL Project Manager: TINA BERRY
City: SAN JOSE State: CA Zip Code: 95110	AFE #:
Telephone: (408) 441-7500 FAX #: (408) 441-7539	Site #, City, State: 5760 SAN LORENZO, CA
Report To: Andrea Lahane Sampler: Don Watenpaugh	QC Data: ☒ Level D (Standard) ☐ Level C ☐ Level B ☐ Level A

Turnaround Time: ☒ 10 Work Days ☐ 5 Work Days ☐ 3 Work Days ☐ 2 Work Days ☐ 1 Work Day ☐ 2-8 Hours

CODE: ☐ Misc. ☐ Detect. ☐ Eval. ☒ Remed. ☐ Demol. ☐ Closure

☐ Drinking Water ☐ Waste Water ☒ Other AIR

Analyses Requested: TPPH-G / BTEX 8611620

	Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	TPPH-G									Comments
1.	INF	11/11/96 13:00	AIR	1	BAG	1A	X									
2.																
3.																
4.																
5.																
6.																
7.																
8.																
9.																
10.																

Relinquished By: Don Watenpaugh	Date: 11/11/96	Time: 16:00	Received By: D. Alarcon	Date: 11/11/96	Time: 16:00
Relinquished By: D. Alarcon	Date: 11/12/96	Time: 0920	Received By: Michael Weis	Date: 11-12-96	Time: 0920
Relinquished By: Michael Weis	Date:	Time:	Received By Lab:	Date: 11/12/96	Time: 1115

Were Samples Received in Good Condition? ☐ Yes ☐ No Samples on Ice? ☐ Yes ☐ No Method of Shipment _____ Page __ of __

To be completed upon receipt of report:
1) Were the analyses requested on the Chain of Custody reported? ☒ Yes ☐ No If no, what analyses are still needed? _____
2) Was the report issued within the requested turnaround time? ☒ Yes ☐ No If no, what was the turnaround time? _____

Approved by: D. Alarcon Signature: D. Alarcon Company: PEG Date: 11/20/96

Pink - Client
Yellow - Laboratory
White - Laboratory

Sequoia Analytical

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

Client Proj. ID: 310-058.5A, 5760, San Lorenzo
Lab Proj. ID: 9612007

Sampled: 11/27/96
Received: 12/02/96
Analyzed: see below

Attention: Andrew Lehane

Reported: 12/12/96

LABORATORY ANALYSIS

Lab No: 9612007-01
Sample Desc : **LIQUID,Effl**

Analyte	Units	Date Analyzed	Detection Limit	Sample Results
Chemical Oxygen Demand	mg/L	12/11/96	20	N.D.
pH	**pH Units**	**12/02/96**	**N/A**	**7.2**
Total Suspended Solids	mg/L	12/07/96	1.0	N.D.

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

Sequoia Analytical

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Pacific Environmental Group	Client Proj. ID: 310-058.5A, 5760, San Lorenzo	Sampled: 11/27/96
2025 Gateway Place, Suite 440	Sample Descript: Effl	Received: 12/02/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 12/06/96
Attention: Andrew Lehane	Lab Number: 9612007-01	Reported: 12/12/96

QC Batch Number: GC120696BTEX20A
Instrument ID: GCHP20

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	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	82

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

Sequoia Analytical

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Pacific Environmental Group 2025 Gateway Place, Suite 440 San Jose, CA 95110 Attention: Andrew Lehane	Client Proj. ID: 310-058.5A, 5760, San Lorenzo Lab Proj. ID: 9612007	Received: 12/02/96 Reported: 12/12/96

LABORATORY NARRATIVE

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SEQUOIA ANALYTICAL

Tod Granicher
Project Manager

Sequoia Analytical

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Pacific Environmental Group	Client Proj. ID: 310-058.5A/5760, San Lorenzo	Sampled: 12/09/96
2025 Gateway Place, Suite 440	Sample Descript: Infl	Received: 12/09/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 12/12/96
Attention: Andrew Lehane	Lab Number: 9612621-01	Reported: 12/16/96

QC Batch Number: GC121196BTEX03B
Instrument ID: GCHP3

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	**500**	**3800**
Benzene	**5.0**	**14**
Toluene	5.0	N.D.
Ethyl Benzene	**5.0**	**10**
Xylenes (Total)	**5.0**	**800**
Chromatogram Pattern:		**Gas**

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	92

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

SEQUOIA ANALYTICAL - ELAP #1210

Tod Granicher
Project Manager

Sequoia Analytical

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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Proj. ID: 310-058.5A/5760, San Lorenzo	Sampled: 12/09/96
2025 Gateway Place, Suite 440	Sample Descript: Effl	Received: 12/09/96
San Jose, CA 95110	Matrix: LIQUID	
	Analysis Method: 8015Mod/8020	Analyzed: 12/12/96
Attention: Andrew Lehane	Lab Number: 9612621-02	Reported: 12/16/96

QC Batch Number: GC121196BTEX03B
Instrument ID: GCHP3

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	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	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

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Pacific Environmental Group
2025 Gateway Place, Suite 440
San Jose, CA 95110
Attention: Andrew Lehane

Client Proj. ID: 310-058.5A/5760, San Lorenzo
Lab Proj. ID: 9612621

Received: 12/09/96
Reported: 12/16/96

LABORATORY NARRATIVE

In order to properly interpret this report, it must be reproduced in its entirety. This report contains a total of 6 pages including the laboratory narrative, sample results, quality control, and related documents as required (cover page, COC, raw data, etc.).

SEQUOIA ANALYTICAL

Tod Granicher
Project Manager

Sequoia Analytical

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819 Striker Avenue, Suite 8, Sacramento, CA 95834, (916) 921-9600, FAX (916) 921-0100

Pacific Environmental Group	Client Project ID:	310-058.5A / 5760, San Lorenzo	
2025 Gateway Place, Suite 440	Matrix:	LIQUID	
San Jose, CA 95110			
Attention: Andrew Lehane	Work Order #:	9612621 01, 02	Reported: Dec 18, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC121196BTEX03B	GC121196BTEX03B	GC121196BTEX03B	GC121196BTEX03B
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	D. Jirsa	D. Jirsa	D. Jirsa	D. Jirsa
MS/MSD #:	961251801	961251801	961251801	961251801
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	12/11/96	12/11/96	12/11/96	12/11/96
Analyzed Date:	12/11/96	12/11/96	12/11/96	12/11/96
Instrument I.D.#:	GCHP3	GCHP3	GCHP3	GCHP3
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	8.2	8.5	8.8	29
MS % Recovery:	82	85	88	97
Dup. Result:	8.6	8.8	9.1	29
MSD % Recov.:	86	88	91	97
RPD:	4.8	3.5	3.4	0.0
RPD Limit:	0-25	0-25	0-25	0-25
LCS #:	BLK121196	BLK121196	BLK121196	BLK121196
Prepared Date:	12/11/96	12/11/96	12/11/96	12/11/96
Analyzed Date:	12/11/96	12/11/96	12/11/96	12/11/96
Instrument I.D.#:	GCHP3	GCHP3	GCHP3	GCHP3
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	8.5	9.0	9.5	31
LCS % Recov.:	85	90	95	103
MS/MSD Control Limits	60-140	60-140	60-140	60-140
LCS Control Limits	70-130	70-130	70-130	70-130

SEQUOIA ANALYTICAL

Tod Granicher
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS=Matrix Spike, MSD=MS Duplicate, RPD=Relative % Difference

SEQUOIA ANALYTICAL SAMPLE RECEIPT LOG

CLIENT NAME: PEG
REC. BY (PRINT)

WORKORDER: 9612621
DATE OF LOG-IN: 12-11-96

CIRCLE THE APPROPRIATE RESPONSE

1. Custody Seal(s): Present / (Absent) Intact / Broken*
2. Custody Seal #: Put in Remarks Section
3. Chain-of-Custody: (Present) / Absent*
4. Traffic Reports or Packing List: Present / (Absent)
5. Airbill: Airbill / Sticker Present / (Absent)
6. Airbill #: ———
7. Sample Tags: (Present) / Absent
   Sample Tags #s: (Listed) / Not Listed on Chain-of-Custody
8. Sample Condition: (Intact) / Broken* / Leaking*
9. Does information on custody reports, traffic reports and sample tags agree? (Yes) / No*
10. Proper Preservatives used: (Yes) / No*
11. Date Rec. at Lab: 12-09-96
12. Time Rec. at Lab: 17:17
13. Temp Rec. at Lab: 10°C

LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION (ETC.)
1	A-C	Infl	VOA (3)	liquid	12-04	
2	↓	Effl	↓	↓	↓	

12-09-96

*if Circled, contact Project Manager and attach record of resolution.

Page 1 of 1

Revision 9/10/96
RCPTLOG1.XLS

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☐ East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
☐ 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: PACIFIC ENV. GROUP INC.	Project Name: 310-058.5A
Address: 2025 GATEWAY PL #440	UNOCAL Project Manager: TINA Berry
City: SAN JOSE State: CA Zip Code: 95110	AFE #:
Telephone: (408) 441-7500 FAX #: (408) 441-7539	Site #, City, State: 5760 SAN LORENZO, CA
Report To: Andrew Lehane Sampler: Don Waterpaugh	QC Data: ☒ Level D (Standard) ☐ Level C ☐ Level B ☐ Level A

Turnaround Time: ☒ 10 Work Days ☐ 5 Work Days ☐ 3 Work Days ☐ 2 Work Days ☐ 1 Work Day ☐ 2-8 Hours

CODE: ☐ Misc. ☐ Detect. ☐ Eval. ☒ Remed. ☐ Demol. ☐ Closure

☐ Drinking Water ☒ Waste Water ☐ Other

Analyses Requested 9612621

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	TPPH-G / BTEX	Comments
1. INF1 12/9/96	11:30	H_2O	3	VOA	1	X	
2. EFF1 12/9/96	11:30	H_2O	3	VOA	2	X	
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							

Relinquished By: Don Waterpaugh	Date: 12/9/96	Time: 14:30	Received By: D. Alarcon	Date: 12/9/96	Time: 14:30
Relinquished By: D. Alarcon	Date: 12/9/96	Time: 4:10	Received By: [illegible]	Date: 12/9/96	Time: 4:10
Relinquished By: [illegible]	Date: 12/9/96	Time:	Received By Lab: [illegible]	Date: 12-09-96	Time: 17:07

Were Samples Received in Good Condition? ☐ Yes ☐ No Samples on Ice? ☐ Yes ☐ No Method of Shipment _____ Page __ of __

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? ☒ Yes ☐ No If no, what analyses are still needed? _____

2) Was the report issued within the requested turnaround time? ☒ Yes ☐ No If no, what was the turnaround time? _____

Approved by: D. Alarcon Signature: D. Alarcon Company: PEG Date: 12/21/96

White - Laboratory Yellow - Laboratory Pink - Client

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 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: 310-058.5A/5760, San Lorenzo	Sampled: 12/09/96
2025 Gateway Place, Suite 440	Sample Descript: Infl	Received: 12/09/96
San Jose, CA 95110	Matrix: AIR	
	Analysis Method: 8015Mod/8020	Analyzed: 12/10/96
Attention: Andrew Lehane	Lab Number: 9612433-01	Reported: 12/12/96

QC Batch Number: GC121096BTEX17A
Instrument ID: GCHP17

Total Purgeable Petroleum Hydrocarbons (TPPH) with BTEX

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	10	57
Benzene	0.10	0.12
Toluene	0.10	1.8
Ethyl Benzene	0.10	1.6
Xylenes (Total)	0.10	7.9
Chromatogram Pattern:		Gas

Surrogates	Control Limits %		% Recovery
Trifluorotoluene	70	130	137 Q

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, (415) 364-9600, FAX (415) 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: Andrew Lehane	Client Proj. ID: 310-058.5A/5760, San Lorenzo Lab Proj. ID: 9612433	Received: 12/09/96 Reported: 12/12/96

LABORATORY NARRATIVE

In order to properly interpret this report, it must be reproduced in its entirety. This report contains a total of 4 pages including the laboratory narrative, sample results, quality control, and related documents as required (cover page, COC, raw data, etc.).

SEQUOIA ANALYTICAL

Tod Granicher
Project Manager

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 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: Andrew Lehane

Client Project ID: 310-058.5A / 5760, San Lorenzo

Work Order #: 9612433 01

Reported: Dec 17, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC121096BTEX17A	GC121096BTEX17A	GC121096BTEX17A	GC121096BTEX17A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	D. Jirsa	D. Jirsa	D. Jirsa	D. Jirsa
MS/MSD #:	961234407	961234407	961234407	961234407
Sample Conc.:	N.A.	N.A.	N.A.	N.A.
Prepared Date:	12/10/96	12/10/96	12/10/96	12/10/96
Analyzed Date:	12/10/96	12/10/96	12/10/96	12/10/96
Instrument I.D.#:	GCHP17	GCHP17	GCHP17	GCHP17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	9.4	9.8	10	30
MS % Recovery:	94	38	100	100
Dup. Result:	10	11	11	32
MSD % Recov.:	100	110	110	107
RPD:	6.3	12	9.5	6.5
RPD Limit:	0-25	0-25	0-25	0-25
LCS #:	BLK121096	BLK121096	BLK121096	BLK121096
Prepared Date:	12/10/96	12/10/96	12/10/96	12/10/96
Analyzed Date:	12/10/96	12/10/96	12/10/96	12/10/96
Instrument I.D.#:	GCHP17	GCHP17	GCHP17	GCHP17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	9.5	10	10	31
LCS % Recov.:	95	100	100	103
MS/MSD	60-140	60-140	60-140	60-140
LCS	70-130	70-130	70-130	70-130
Control Limits				

SEQUOIA ANALYTICAL

Tod Granicher
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS = Matrix Spike, MSD = MS Duplicate, RPD = Relative % Difference

Sequoia Analytical

680 Chesapeake Drive, Redwood City, CA 94063, (415) 364-9600, FAX (415) 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: Andrew Lehane

Client Project ID: 310-058.5A / 5760, San Lorenzo
Work Order #: 9612433 01
Reported: Dec 17, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC121096BTEX17A	GC121096BTEX17A	GC121096BTEX17A	GC121096BTEX17A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030
Analyst:	D. Jirsa	D. Jirsa	D. Jirsa	D. Jirsa
MS/MSD #:	961234407	961234407	961234407	961234407
Sample Conc.:	N.A.	N.A.	N.A.	N.A.
Prepared Date:	12/10/96	12/10/96	12/10/96	12/10/96
Analyzed Date:	12/10/96	12/10/96	12/10/96	12/10/96
Instrument I.D.#:	GCHP17	GCHP17	GCHP17	GCHP17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	9.4	9.8	10	30
MS % Recovery:	94	38	100	100
Dup. Result:	10	11	11	32
MSD % Recov.:	100	110	110	107
RPD:	6.3	12	9.5	6.5
RPD Limit:	0-25	0-25	0-25	0-25
LCS #:	BLK121096	BLK121096	BLK121096	BLK121096
Prepared Date:	12/10/96	12/10/96	12/10/96	12/10/96
Analyzed Date:	12/10/96	12/10/96	12/10/96	12/10/96
Instrument I.D.#:	GCHP17	GCHP17	GCHP17	GCHP17
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	9.5	10	10	31
LCS % Recov.:	95	100	100	103
MS/MSD Control Limits	60-140	60-140	60-140	60-140
LCS Control Limits	70-130	70-130	70-130	70-130

SEQUOIA ANALYTICAL

Tod Granicher
Project Manager

Please Note:
The LCS is a control sample of known, interferent-free matrix that is analyzed using the same reagents, preparation, and analytical methods employed for the samples. The matrix spike is an aliquot of sample fortified with known quantities of specific compounds and subjected to the entire analytical procedure. If the recovery of analytes from the matrix spike does not fall within specified control limits due to matrix interference, the LCS recovery is to be used to validate the batch.

** MS=Matrix Spike, MSD=MS Duplicate, RPD=Relative % Difference

SEQUOIA ANALYTICAL SAMPLE RECEIPT LOG

CLIENT NAME: PEG
REC. BY (PRINT): Phil

WORKORDER: 9612433
DATE OF LOG-IN: 12-9-96

CIRCLE THE APPROPRIATE RESPONSE

1. Custody Seal(s): Present / (Absent) Intact / Broken*
2. Custody Seal #: Put in Remarks Section
3. Chain-of-Custody: (Present) / Absent*
4. Traffic Reports or Packing List: Present / (Absent)
5. Airbill: Airbill / Sticker Present / (Absent)
6. Airbill #: —
7. Sample Tags: (Present) / Absent
   Sample Tags #s: (Listed) / Not Listed on Chain-of-Custody
8. Sample Condition: (Intact) / Broken* / Leaking*
9. Does information on custody reports, traffic reports and sample tags agree? (Yes) / No*
10. Proper Preservatives used: (Yes) / No*
11. Date Rec. at Lab: 12-09-96
12. Time Rec. at Lab: 17:07
13. Temp Rec. at Lab: —

LAB SAMPLE #	DASH #	CLIENT IDENTIFICATION	CONTAINER DESCRIPTION	SAMPLE MATRIX	DATE SAMP.	REMARKS: CONDITION (ETC.)
1	A	INFL	Tedlar	air	12-09-96	

Phil 12-9-96 17:07

*if Circled, contact Project Manager and attach record of resolution.

Revision 9/10/96

UNOCAL 76

☑ 680 Chesapeake Drive • Redwood City, CA 94063 • (415) 364-9600
☐ 819 Striker Ave., Suite 8 • Sacramento, CA 95834 • (916) 921-9600
☐ 404 N. Wiget Lane • Walnut Creek, CA 94598 • (510) 988-9600
☐ 18939 120th Ave., N.E., Suite 101 • Bothell, WA 98011 • (206) 481-9200
☐ East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
☐ 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: Pacific Env. Group, Inc.	Project Name: 310-058.5A
Address: 2025 GATEWAY Pl, #440	UNOCAL Project Manager: TINA Berry
City: SAN Jose State: CA Zip Code: 95110	AFE #:
Telephone: (408) 441-7500 FAX #: (408) 441-7539	Site #, City, State: 5760 SAN Leandro, CA
Report To: Andrew Lehane Sampler: Don Watenpaugh	QC Data: ☑ Level D (Standard) ☐ Level C ☐ Level B ☐ Level A

Turnaround Time: ☒ 10 Work Days ☐ 5 Work Days ☐ 3 Work Days ☐ 2 Work Days ☐ 1 Work Day ☐ 2-8 Hours

CODE: ☐ Misc. ☐ Detect. ☐ Eval. ☒ Remed. ☐ Demol. ☐ Closure

☐ Drinking Water ☐ Waste Water ☑ Other AIR

Analyses Requested 9101243 3

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	TPPH 9 / BTEX	Comments
1. INF1 12	9/96 12:00	AIR	1	BAG	1	X	
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							

Relinquished By: Don Watenpaugh	Date: 12/9/96	Time: 14:30	Received By: O. Alarcon	Date: 12/9/96	Time: 14:30
Relinquished By: O. Alarcon	Date: 12/9/96	Time: 4:10	Received By: [illegible]	Date: 12/9/96	Time: 4:10
Relinquished By: [illegible]	Date: 12/9/96	Time:	Received By Lab: [illegible]	Date: 12-09-96	Time: 17:07

Were Samples Received in Good Condition? ☐ Yes ☐ No Samples on Ice? ☐ Yes ☐ No Method of Shipment _____ Page __ of __

To be completed upon receipt of report:
1) Were the analyses requested on the Chain of Custody reported? ☒ Yes ☐ No If no, what analyses are still needed? _____
2) Was the report issued within the requested turnaround time? ☒ Yes ☐ No If no, what was the turnaround time? _____

Approved by: D. Alarcon Signature: O. Alarcon Company: PEG Date: 12/10/96

Pink - Client
Yellow - Laboratory
White - Laboratory

ATTACHMENT C

FIELD DATA SHEETS

FIELD SERVICES / O&M REQUEST Work Order # 6404

SITE INFORMATION FORM

Identification

Project # 310 058 5A

Station # 5760

Site Address: 376 Lewelling Blvd. Sanlorenzo

County: Alameda

Project Manager: ADL

Requestor: Jessica N.

Client: Unocal

Project Type

- [ ] 1st Time Visit
- [ ] Quarterly
  - [ ] 1st [ ] 2nd [ ] 3rd [ ] 4th
- [ ] Monthly
- [ ] Semi-Monthly
- [ ] Weekly
- [x] One time event
- [ ] Other: ______

ARRIVED = 8:00
DEPARTED = 9:45

Client P.O.C.: Tina [illegible]

Date of Request: 10/10/96

Ideal field date(s): 10/12

Check Appropriate Category

Budget Hrs. 3

Actual Hrs.

Mob de Mob

Field Tasks: For General Description

circle one:
Priority: 1. (emergency, must be done within 24 hrs); 2. (next visit); 3. (when available)

Mark Gubrud

POST Attached: (1) Permits (2) SSP (3) Also signs Prop 65 & phone contact

- REPLACE CARBON DRUM (Downstairs in Storage room)
- LABEL ALL DRUMS / CONTAINERS

AUDIT CREW MAY NOT SHOW UP 10/15 BE THERE AROUND 10 am just in case. May want to replace carbon then.

Comments, remarks, etc. from Field Staff (include problems encountered and out-of-scope work)

- CHANGED OUT PRIMARY CARBON DRUM (ON GWS), MADE SECONDARY DRUM THE PRIMARY AND THE NEW DRUM THE SECONDARY, FILLED NEW DRUM WITH TAP WATER FOR PRE-SOAKING, SYSTEMS OFF UPON ARRIVAL, SYSTEMS OFF ON DEPARTURE UNTIL 10/15, CONTAINED ALL PERMITS IN LARGE ZIP LOCK BAG AND STORED THEM IN PLASTIC CONTAINER INSIDE COMPOUND, PICKED UP ALL TRASH INSIDE COMPOUND. LABELED ALL DRUMS / CONTAINERS. * 2 SPENT CARBON DRUMS INSIDE COMPOUND.

- [ ] Samples taken [ ] Samples not required [ ] Soil Vapor [ ] Groundwater
- [ ] Weekly [ ] Semi-Monthly [ ] Monthly [ ] Quarterly [ ] Semi-Annual

PACIFIC ENVIRONMENTAL GROUP, INC.

Completed by: [signature] Date: 10/13/96

Checked by: ______

White Copy - Originator Yellow Copy - O & M Tech Pink Copy - File

FIELD SERVICES / O&M REQUEST

Work Order # 6374

SITE INFORMATION FORM

Identification

Project # 310-052.5A / 310-127.5A

Station # 5760 / 5367

Site Address:

5760 - 376 Lewelling Blvd, San Leandro

5367 - 500 Bancroft Ave, San Leandro

County:

Project Manager: Joe M

Requestor: Joe M

Client: Unocal

Project Type

- ☐ 1st Time Visit
- ☐ Quarterly
  - ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th
- ☐ Monthly
- ☐ Semi-Monthly
- ☐ Weekly
- ☐ One time event
- ☐ Other:

Client P.O.C.: Tina Berry

Date of Request 9/26/96

Ideal field date(s): 10/15/96

MARK GUBRUD

Check Appropriate Category

Budget Hrs.

Actual Hrs.

Mob de Mob

Field Tasks: For General Description

circle one:

Priority: 1. (emergency, must be done within 24 hrs); 2. (next visit); 3. (when available)

- Please Schedule O&M visits for Tues 10/15/96 in A.M.

Unocal will be performing site safety audits of our work - need to make sure of following:

- Tech has attached Handbook.
- Carry 40hr OSHA CARD.
- Site Safety Plan is onsite
- Necessary PPE is being worn
- Permits (A.V/water) posted
- Prop 65 sign posted.
- Emergency phone # posted.
- Compound is clean
- Drums labeled

Andrew Lehane will follow up on the above prior to site visits on 10/15/96.

Comments, remarks, etc. from Field Staff (include problems encountered and out-of-scope work)

☑ Samples taken ☐ Samples not required ☐ Soil Vapor ☐ Groundwater

☐ Weekly ☐ Semi-Monthly ☐ Monthly ☐ Quarterly ☐ Semi-Annual

PACIFIC ENVIRONMENTAL GROUP, INC.

Completed by: MG Date: 10/15/96

Checked by:

White Copy - Originator Yellow Copy - O & M Tech Pink Copy - File

FIELD SERVICES / O&M REQUEST

Work Order # 5653

SITE INFORMATION FORM

Identification

Project # 310-058.5A

Station # 5760

Site Address: UNOCAL
376 LEWELLING BLVD.
SAN LORENZO

County: ALAMEDA

Project Manager: ANDREW L.

Requestor: STEVE C.

Client: UNOCAL

Project Type

- ☐ 1st Time Visit
- ☒ Quarterly
  - ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th
- ☒ Monthly
- ☒ Semi-Monthly
- ☐ Weekly
- ☐ One time event
- ☐ Other: _____

Client P.O.C.: TINA BERRY

Date of Request _____

Ideal field date(s): _____

Check Appropriate Category

Budget Hrs. _____

Actual Hrs. 2.5

Mob de Mob _____

Field Tasks: For General Description

circle one:
Priority: 1. (emergency, must be done within 24 hrs); 2. (next visit); 3. (when available)

SEMI-MONTHLY: DATA COLLECTION/SYSTEM OPTIMIZATION (SVE & GWE): FILL OUT DATA SHEET

MONTHLY: SVE:- FID READINGS FROM INFL, MID-1, EFFL FOR BAAQMD COMPLIANCE (MUST DO)
- INFL AIR BAG SAMPLE (TO SEQUOIA) FOR TPPH-G & BTEX
GWE:- TAKE INFL & EFFL SAMPLES FOR TPPH-G & BTEX (TO SEQUOIA)
PERFORM REGULAR WATER SEMIMONTHLY TASKS

QUARTERLY: GWE:- TAKE EFFL WATER SAMPLES (TO SEQUOIA) FOR pH, COD, TSS

(TOTAL SUSPENDED SOLIDS IS NON-PRESERVED, PLASTIC <TSS>)
(CHEM. OXYGEN DEMAND IS H_2SO_4 PRESERVED, PLASTIC <COD>)
QUARTERLY = FEB, MAY, AUGUST, NOVEMBER
(REQUEST REVISED 7/24/96 by SMN)

Comments, remarks, etc. from Field Staff (include problems encountered and out-of-scope work)

☒ Samples taken ☐ Samples not required ☒ Soil Vapor ☒ Groundwater

☐ Weekly ☐ Semi-Monthly ☐ Monthly ☐ Quarterly ☐ Semi-Annual

PACIFIC ENVIRONMENTAL GROUP, INC.

Completed by: _____ Date: 10/15/96

Checked by: _____

White Copy - Originator Yellow Copy - Field Tech Pink Copy - File

Soil Vapor and Groundwater Extraction System
Unocal Service Station 5760
376 Lewelling Boulevard
San Lorenzo, California
310-058.5A

Name: M.S. Date/Time: 10/15/96 8:45

TREATMENT SYSTEM READINGS

SVE Operational Upon Arrival?	no
SVE Blower Hour Meter Reading	02316
Electric Meter (kw-hrs)	07089
Total Vacuum from Wells (" of H20)	10
SVE Total Air Flow To Carbon (cfm)	.14
Manual Air Dilution Valve Position? % OPEN	0
Post-Dilution SVE Air Flow To Carbon (cfm)	0
Bag Filter Pressure (psi). Filt Changed?	3 / YES
Was the Oil Changed This Month on Blower?	no
SVE Influent FID Reading (ppm)	wc 40 / wac @ 40
SVE Mid FID Reading (ppm)	40/40
SVE Effluent FID Reading (ppm)	55/56

GWS Operational Upon Arrival?	no
GWS Totalizer (gallons)	0243783
Liquid Carbon #1 Pressure (psi)	2.75
Liquid Carbon #2 Pressure (psi)	1.75
GWS Second Cont. Switch Operational?	YES
GWS Effluent Temperature (F)	61.2
GWS Effluent pH	8.74

* arrived @ 8:15 Connected all hosing on GWS Carbons change BAG, Filter, activated BOTH (GW/SVE) @ 8:45,

* Have to use 10-1 Dilution kit on FID.

Sample @ 9:15, Departed = 9:3

UNOCAL 76

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☐ 404 N. Wiget Lane • Walnut Creek, CA 94598 • (510) 988-9600
☐ 18939 120th Ave., N.E., Suite 101 • Bothell, WA 98011 • (206) 481-9200
☐ East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
☐ 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: DDC ENV. GRP.
Address: 2025 Gateway Pl #440
City: San Jose State: Ca. Zip Code: 95110
Telephone: 408 441 7500 FAX #: 408 441 7539
Report To: Andrea Lahane Sampler: Mark Gilbert

Project Name: 310-058.5A
UNOCAL Project Manager: Tina Berry
AFE #:
Site #, City, State: 5760, San Lorenzo, Ca.
QC Data: ☒ Level D (Standard) ☐ Level C ☐ Level B ☐ Level A

Turnaround Time: ☒ 10 Work Days ☐ 5 Work Days ☐ 3 Work Days ☐ 2 Work Days ☐ 1 Work Day ☐ 2-8 Hours

CODE: ☐ Misc. ☐ Detect. ☐ Eval. ☒ Remed. ☐ Demol. ☐ Closure

☐ Drinking Water
☒ Waste Water
☒ Other Air

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	Gas/BTEX								Comments
1. INFL	10/15/96	H2O	3	Voa		X								
2. EFFL	10/15/96	H2O	3	Voa		X								
3.														
4. INFL	10/15/96	Air	1	Bag		X								
5.														
6.														
7.														
8.														
9.														
10.														

Relinquished By:	Date:	Time:	Received By:	Date:	Time:
[signature]	10/16/96	757			
			Received By Lab:		

Were Samples Received in Good Condition? ☐ Yes ☐ No Samples on Ice? ☐ Yes ☐ No Method of Shipment______ Page __ of __

To be completed upon receipt of report:
1) Were the analyses requested on the Chain of Custody reported? ☐ Yes ☐ No If no, what analyses are still needed? ______
2) Was the report issued within the requested turnaround time? ☐ Yes ☐ No If no, what was the turnaround time? ______

Approved by: ______ Signature: ______ Company: ______ Date: ______

Pink - Client
Yellow - Laboratory
White - Laboratory

FIELD SERVICES / O&M REQUEST

Work Order # 5653

SITE INFORMATION FORM

PACIFIC ENVIRONMENTAL GROUP, INC

Identification

Project # 310-058.5A

Station # 5760

Site Address: UNOCAL
376 LEWELLING BLVD.
SAN LORENZO

County: ALAMEDA

Project Manager: ANDREW L.

Requestor: STEVE C.

Client: UNOCAL

Project Type

- [ ] 1st Time Visit
- [x] Quarterly
  - [ ] 1st [ ] 2nd [ ] 3rd [ ] 4th
- [x] Monthly
- [x] Semi-Monthly
- [ ] Weekly
- [ ] One time event
- [ ] Other: ______

Client P.O.C.: TINA BERRY

Date of Request ______

Ideal field date(s): ______

Check Appropriate Category

Budget Hrs. ______

Actual Hrs. 2

Mob de Mob 1.5

Field Tasks: For General Description

circle one:
Priority: 1. (emergency, must be done within 24 hrs); 2. (next visit); 3. (when available)

SEMI-MONTHLY: DATA COLLECTION/SYSTEM OPTIMIZATION (SVE & GWE): FILL OUT DATA SHEET

MONTHLY: SVE; - FID READINGS FROM INFL, MID-1, EFFL FOR BAAQMD COMPLIANCE (MUST DO)
- INFL AIR BAG SAMPLE (TO SEQUOIA) FOR TPPH-G & BTEX

GWE; - TAKE INFL & EFFL WATER SAMPLES FOR TPPH-G & BTEX (TO SEQUOIA)
PERFORM REGULAR SEMIMONTHLY TASKS

QUARTERLY: GWE - TAKE EFFL WATER SAMPLES (TO SEQUOIA) FOR pH, COD, TSS

(TOTAL SUSPENDED SOLIDS IS NON-PRESERVED, PLASTIC <TSS>)
(CHEM. OXYGEN DEMAND IS H_2SO_4 PRESERVED, PLASTIC <COD>)
QUARTERLY = FEB, MAY, AUGUST, NOVEMBER
(REQUEST REVISED 7/24/96 by SMN)

Comments, remarks, etc. from Field Staff (include problems encountered and out-of-scope work)

Need warning light Bulb for panel
#s on Bulb 120 PSB8 & 30SYI
120 PS B5

- [ ] Samples taken
- [ ] Samples not required
- [ ] Soil Vapor
- [ ] Groundwater
- [ ] Weekly
- [x] Semi-Monthly
- [x] Monthly
- [ ] Quarterly
- [ ] Semi-Annual

Completed by: ______ Date: 11-11-96

Checked by: ______

PACIFIC ENVIRONMENTAL GROUP, INC.

White Copy - Originator Yellow Copy - O & M Tech Pink Copy - File

Soil Vapor and Groundwater Extraction System
Unocal Service Station 5760
376 Lewelling Boulevard
San Lorenzo, California
310-058.5A

Name: Don Watenpaugh Date/Time: 11/11/96 12:45

TREATMENT SYSTEM READINGS

SVE Operational Upon Arrival?	yes
SVE Blower Hour Meter Reading	02969
Electric Meter (kw-hrs)	08377
Total Vacuum from Wells (" of H20)	12"
SVE Total Air Flow To Carbon (cfm)	,10"
Manual Air Dilution Valve Position? 2's open	5
Post-Dilution SVE Air Flow To Carbon (cfm)	0
Bag Filter Pressure (psi). Filt Changed?	≈4psi / yes
Was the Oil Changed This Month on Blower?	no
SVE Influent FID Reading (ppm)	WOC 8 / WC 12
SVE Mid FID Reading (ppm)	10 / 12
SVE Effluent FID Reading (ppm)	10 / 12

Bkgd 3 / Bkgd 7

GWS Operational Upon Arrival?	yes
GWS Totalizer (gallons)	029827/
Liquid Carbon #1 Pressure (psi)	4psi
Liquid Carbon #2 Pressure (psi)	< 3psi
GWS Second Cont. Switch Operational?	yes
GWS Effluent Temperature (F)	71.6° F
GWS Effluent pH	7.55 pH

arrived 12:45
left 2:30

UNOCAL 76

☒ 680 Chesapeake Drive • Redwood City, CA 94063 • (415) 364-9600
☐ 819 Striker Ave., Suite 8 • Sacramento, CA 95834 • (916) 921-9600
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☐ 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: PAC. ENV Group, Inc.	Project Name: 310-058.5A
Address: 2025 GATEWAY Pl. #440	UNOCAL Project Manager: TINA Berry
City: SAN JOSE State: CA Zip Code: 95110	AFE #:
Telephone: (408)441-7500 FAX #: 408 441-7539	Site #, City, State: 5760 SAN LORENZO, CA
Report To: Andrew Lahare Sampler: DON WATENPAUGH	QC Data: ☒ Level D (Standard) ☐ Level C ☐ Level B ☐ Level A

Turnaround Time: ☒ 10 Work Days ☐ 5 Work Days ☐ 3 Work Days ☐ 2 Work Days ☐ 1 Work Day ☐ 2-8 Hours

CODE: ☐ Misc. ☐ Detect. ☐ Eval. ☒ Remed. ☐ Demol. ☐ Closure

☐ Drinking Water ☒ Waste Water ☐ Other

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	TPPH-G/BTEX	Comments
1. EFF1	11/11/96 12:00	H_2O	3	VOA			
2. INF1	11/11/96 13:00	H_2O	3	VOA			
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							

Relinquished By: DON WATENPAUGH	Date: 11/11/96	Time: 16:00	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab:	Date:	Time:

Were Samples Received in Good Condition? ☐ Yes ☐ No Samples on Ice? ☐ Yes ☐ No Method of Shipment _____ Page __ of __

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? ☐ Yes ☐ No If no, what analyses are still needed? _____
2) Was the report issued within the requested turnaround time? ☐ Yes ☐ No If no, what was the turnaround time? _____

Approved by: Signature: Company: Date:

Pink - Client
Yellow - Laboratory
White - Laboratory

UNOCAL 76

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☐ 18939 120th Ave., N.E., Suite 101 • Bothell, WA 98011 • (206) 481-9200
☐ East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
☐ 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: PAC. ENV. GROUP, INC.	Project Name: 310-0558, 51A
Address: 2025 GATEWAY PL #440	UNOCAL Project Manager: TINA BERRY
City: SAN JOSE State: CA Zip Code: 95110	AFE #:
Telephone: (408) 441-7500 FAX #: (408) 441-7539	Site #, City, State: 5760 SAN LORENZO, CA
Report To: Andrea Lahane Sampler: Don Watenpaugh	QC Data: ☒ Level D (Standard) ☐ Level C ☐ Level B ☐ Level A

Turnaround Time: ☒ 10 Work Days ☐ 5 Work Days ☐ 3 Work Days ☐ 2 Work Days ☐ 1 Work Day ☐ 2-8 Hours

CODE: ☐ Misc. ☐ Detect. ☐ Eval. ☒ Remed. ☐ Demol. ☐ Closure

☐ Drinking Water ☐ Waste Water ☒ Other AIR

Analyses Requested: TPPH-G / BTEX

	Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	TPPH-G / BTEX	Comments
1.	INF1	11/11/96 13:00	AIR	1	BAG		X	
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								

Relinquished By: Don Watenpaugh	Date: 11/11/96	Time: 16:00	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab:	Date:	Time:

Were Samples Received in Good Condition? ☐ Yes ☐ No Samples on Ice? ☐ Yes ☐ No Method of Shipment_____ Page __ of __

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? ☐ Yes ☐ No If no, what analyses are still needed? _____
2) Was the report issued within the requested turnaround time? ☐ Yes ☐ No If no, what was the turnaround time? _____

Approved by: Signature: Company: Date:

Pink - Client
Yellow - Laboratory
White - Laboratory

DEC 03 1996

FIELD SERVICES / O&M REQUEST

Work Order # 5653

SITE INFORMATION FORM

Identification

Project # 310-058.5A

Station # 5760

Site Address: UNOCAL 376 LEWELLING BLVD. SAN LORENZO

County: ALAMEDA

Project Manager: ANDREW L.

Requestor: STEVE C.

Client: UNOCAL

Project Type

- ☐ 1st Time Visit
- ☒ Quarterly
  - ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th
- ☒ Monthly
- ☒ Semi-Monthly
- ☐ Weekly
- ☐ One time event
- ☐ Other: _____

Client P.O.C.: TINA BERRY

Date of Request _____

Ideal field date(s): _____

Check Appropriate Category

Budget Hrs. _____

Actual Hrs. 2

Mob de Mob _____

Field Tasks: For General Description

circle one:
Priority: 1. (emergency, must be done within 24 hrs); 2. (next visit); 3. (when available)

SEMI-MONTHLY: DATA COLLECTION/SYSTEM OPTIMIZATION (SVE & GWE): FILL OUT DATA SHEET

MONTHLY: SVE:- FIO READINGS FROM INFL, MID-1, EFFL FOR BAAQMD COMPLIANCE (MUST DO)
- INFL AIR BAG SAMPLE (TO SEQUOIA) FOR TPPH-G & BTEX
GWE:- TAKE INFL & EFFL WATER SAMPLES FOR TPPH-G & BTEX (TO SEQUOIA)
PERFORM REGULAR SEMIMONTHLY TASKS

QUARTERLY: GWE:- TAKE EFFL WATER SAMPLES (TO SEQUOIA) FOR pH, COD, TSS

(TOTAL SUSPENDED SOLIDS IS NON-PRESERVED, PLASTIC <TSS>)
(CHEM. OXYGEN DEMAND IS H_2SO_4 PRESERVED, PLASTIC <COD>)
QUARTERLY = FEB, MAY, AUGUST, NOVEMBER
(REQUEST REVISED 7/24/96 by SMN)

Comments, remarks, etc. from Field Staff (include problems encountered and out-of-scope work)

Resample GWE effluent for BTEX
Need 3-VOAs pH, COD, TSS 1:50 - 1:00
PIG 1 200 ml H_2SO_4
PIG 1 500 ml NP

☒ Samples taken ☐ Samples not required ☐ Soil Vapor ☐ Groundwater
☐ Weekly ☒ Semi-Monthly ☐ Monthly ☒ Quarterly ☐ Semi-Annual

PACIFIC ENVIRONMENTAL GROUP, INC.

Completed by: [signature] Date: 11/27/96

Checked by: _____

Soil Vapor and Groundwater Extraction System
Unocal Service Station 5760
376 Lewelling Boulevard
San Lorenzo, California
310-058.5A

Name: Don Waterpaugh

Date/Time: 11/27/96 11:30

TREATMENT SYSTEM READINGS

SVE Operational Upon Arrival?	NO *
SVE Blower Hour Meter Reading	03303.15
Electric Meter (kw-hrs)	09111
Total Vacuum from Wells (" of H20)	26" H_2O
SVE Total Air Flow To Carbon (cfm)	,30" H_2O
Manual Air Dilution Valve Position?	Closed
Post-Dilution SVE Air Flow To Carbon (cfm)	26" H_2O
Bag Filter Pressure (psi). Filt Changed?	70/2 6/2 yes
Was the Oil Changed This Month on Blower?	NO
SVE Influent FID Reading (ppm)	wc / wc 16 / 5
SVE Mid FID Reading (ppm)	18 / 6
SVE Effluent FID Reading (ppm)	18 / 7

GWS Operational Upon Arrival?	yes
GWS Totalizer (gallons)	0331768
Liquid Carbon #1 Pressure (psi)	3 ~~8~~ psi
Liquid Carbon #2 Pressure (psi)	3 4 psi
GWS Second Cont. Switch Operational?	yes
GWS Effluent Temperature (F)	NO meter
GWS Effluent pH	No meter

Filter In on Arrival 70 PSI
Out " " 2 PSI
Changed filter - really plugged up with some kind of ~~[illegible]~~ Biological gunk - Cleaned Strainer.
Filter pressure on departure
In ≈ 6 psi
out ≈ 2 psi

KD. - full of water - pressure in filter to high - pump wouldn't go on.
Drained KD. Re Started System
BKgrd FID - 4 ppm

Effl. Samples taken
TPH-G BTEX, COD, TSS, PH

3100585A\O&MFORM.XLS July 24, 1996

UNOCAL 76

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❑ 404 N. Wiget Lane • Walnut Creek, CA 94598 • (510) 988-9600
❑ 18939 120th Ave., N.E., Suite 101 • Bothell, WA 98011 • (206) 487-2200
❑ East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
❑ 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: Pac EN Group Inc	Project Name: 310-058-5A
Address: 2025 GATEWAY Pl Suite 440	UNOCAL Project Manager: Mike Berry
City: San Jose State: CA Zip Code: 95110	AFE #:
Telephone: (408) 441-7500 FAX #: (408) 441-7539	Site #, City, State: 5760 San Lorenzo
Report To: Andrew Lelane Sampler: Drew	QC Data: ☒ Level D (Standard) ❑ Level C ❑ Level B ❑ Level A

Turnaround Time: ☒ 10 Work Days ❑ 5 Work Days ❑ 3 Work Days ❑ 2 Work Days ❑ 1 Work Day ❑ 2-8 Hours

CODE: ❑ Misc. ❑ Detect. ❑ Eval. ☒ Remed. ❑ Demol. ❑ Closure

❑ Drinking Water ☒ Waste Water ❑ Other

Analyses Requested: TPH-G/BTEX; COD; pH/TSS

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	TPH-G/BTEX	COD	pH/TSS	Comments
1. EFF1	11/27/16 11:00	H_2O	3	VOA		X			
2. EFF1	↓ ↓	↓	1	250 ml H_2SO_4			X		
3. EFF1	↓ ↓	↓	1	500 ml NP				X	
4.									
5.									
6.									
7.									
8.									
9.									
10.									

Relinquished By: Drew Lelane	Date: 11/27/16	Time: 17:30	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab:	Date:	Time:

Were Samples Received in Good Condition? ❑ Yes ❑ No Samples on Ice? ❑ Yes ❑ No Method of Shipment _____ Page __ of __

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? ❑ Yes ❑ No If no, what analyses are still needed? _____

2) Was the report issued within the requested turnaround time? ❑ Yes ❑ No If no, what was the turnaround time? _____

Approved by: _____ Signature: _____ Company: _____ Date: _____

Pink - Client

Yellow - Laboratory

White - Laboratory

MON 11

RECEIVED DEC 09 1996 PACIFIC ENVIRONMENTAL GROUP, INC.

FIELD SERVICES / O&M REQUEST

Work Order # 56553

SITE INFORMATION FORM

Identification

Project # 310-058.5A

Station # 5760

Site Address: UNOCAL
376 LEWELLING BLVD.
SAN LORENZO

County: ALAMEDA

Project Manager: ANDREW L.

Requestor: STEVE C.

Client: UNOCAL

Project Type

- ☐ 1st Time Visit
- ☒ Quarterly
  - ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th
- ☒ Monthly
- ☒ Semi-Monthly
- ☐ Weekly
- ☐ One time event
- ☐ Other:

Client P.O.C.: TINA BERRY

Date of Request

Ideal field date(s):

Check Appropriate Category

Budget Hrs.

Actual Hrs. 2.5

Mob de Mob 1.5

Field Tasks: For General Description

circle one:
Priority: 1. (emergency, must be done within 24 hrs); 2. (next visit); 3. (when available)

SEMI-MONTHLY: DATA COLLECTION/SYSTEM OPTIMIZATION (SVE & GWE): FILL OUT DATA SHEET

MONTHLY: SVE:- FID READINGS FROM INFL, MID-1, EFFL FOR BAAQMD COMPLIANCE (MUST DO)
- INFL AIR BAG SAMPLE (TO SEQUOIA) FOR TPPH-G & BTEX
GWE:- TAKE INFL & EFFL WATER SAMPLES FOR TPPH-G & BTEX (TO SEQUOIA)
PERFORM REQUIRED SEMIMONTHLY TASKS

QUARTERLY: GWE:- TAKE EFFL WATER SAMPLES (TO SEQUOIA) FOR pH, COD, TSS

(TOTAL SUSPENDED SOLIDS IS NON-PRESERVED, PLASTIC <TSS>)
(CHEM. OXYGEN DEMAND IS H_2SO_4 PRESERVED, PLASTIC <COD>)
QUARTERLY = FEB, MAY, AUGUST, NOVEMBER
(REQUEST REVISED 7/24/96 by SMN)

Comments, remarks, etc. from Field Staff (include problems encountered and out-of-scope work)

Changed filters in panel (true ones you got worked fine)
Changed oil & greased blower
greased & tightened belts on motor
Changed bag filter, tightened all hose clamps & checked fittings
2-55 gallon carbon drums on-site

☒ Samples taken ☐ Samples not required ☐ Soil Vapor ☐ Groundwater

☐ Weekly ☒ Semi-Monthly ☒ Monthly ☐ Quarterly ☐ Semi-Annual

PACIFIC ENVIRONMENTAL GROUP, INC.

Completed by: Don Wittenmyer Date: 12/9/96

Checked by:

Soil Vapor and Groundwater Extraction System
Unocal Service Station 5760
376 Lewelling Boulevard
San Lorenzo, California
310-058.5A

Name: Don Watenpaugh Date/Time: 12/9/96 11:00

TREATMENT SYSTEM READINGS

SVE Operational Upon Arrival?	yes
SVE Blower Hour Meter Reading	035902.6
Electric Meter (kw-hrs)	09670
Total Vacuum from Wells (" of H20)	28" H_2O
SVE Total Air Flow To Carbon (cfm)	.25" H_2O
Manual Air Dilution Valve Position?	closed
Post-Dilution SVE Air Flow To Carbon (cfm)	4" H_2O
Bag Filter Pressure (psi). Filt Changed?	20psi / yes (8psi)
Was the Oil Changed This Month on Blower?	~~#~~ yes
SVE Influent FID Reading (ppm)	WC WVC 4 / 5
SVE Mid FID Reading (ppm)	4 / 8
SVE Effluent FID Reading (ppm)	4 / 8
Bkgrd	4 / 4
SVE INF/ Before Dilution	4 / 4.5

GWS Operational Upon Arrival?	yes
GWS Totalizer (gallons)	0345737
Liquid Carbon #1 Pressure (psi)	5 psi
Liquid Carbon #2 Pressure (psi)	2 psi
GWS Second Cont. Switch Operational?	yes
GWS Effluent Temperature (F)	64.7°F
GWS Effluent pH	6.92 pH

Filter pressure in 20 psi / 8 ps
out 8psi / 6 ps

UNOCAL 76

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☐ East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
☐ 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: Pacific Env. Group Inc.	Project Name: 310-058.5A
Address: 2025 Gateway Pl #440	UNOCAL Project Manager: Tina Berry
City: San Jose State: CA Zip Code: 95110	AFE #:
Telephone: (408) 441-7500 FAX #: (408) 441-7539	Site #, City, State: 5760 San Lorenzo, CA
Report To: Andrew Lehane Sampler: Don Watenpaugh	QC Data: ☒ Level D (Standard) ☐ Level C ☐ Level B ☐ Level A

Turnaround Time: ☒ 10 Work Days ☐ 5 Work Days ☐ 3 Work Days ☐ 2 Work Days ☐ 1 Work Day ☐ 2-8 Hours

CODE: ☐ Misc. ☐ Detect. ☐ Eval. ☒ Remed. ☐ Demol. ☐ Closure

☐ Drinking Water ☒ Waste Water ☐ Other

Analyses Requested

Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	TPH-g / BTEX									Comments
1. Inf1 12	12/9/96 11:30	H_2O	3	VOA		X									
2. Eff1	12/9/96 11:30	H_2O	3	VOA		X									
3.															
4.															
5.															
6.															
7.															
8.															
9.															
10.															

Pink - Client
Yellow - Laboratory
White - Laboratory

Relinquished By: Don Watenpaugh	Date: 12/9/96	Time: 14:30	Received By:	Date: Time:
Relinquished By:	Date:	Time:	Received By:	Date: Time:
Relinquished By:	Date:	Time:	Received By Lab:	Date: Time:

Were Samples Received in Good Condition? ☐ Yes ☐ No Samples on Ice? ☐ Yes ☐ No Method of Shipment _____ Page __ of __

To be completed upon receipt of report:
1) Were the analyses requested on the Chain of Custody reported? ☐ Yes ☐ No If no, what analyses are still needed? _____
2) Was the report issued within the requested turnaround time? ☐ Yes ☐ No If no, what was the turnaround time? _____

Approved by: Signature: Company: Date:

UNOCAL 76

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☐ East 11115 Montgomery, Suite B • Spokane, WA 99206 • (509) 924-9200
☐ 15055 S.W. Sequoia Pkwy, Suite 110 • Portland, OR 97222 • (503) 624-9800

Consultant Company: Pacific Env. Group, Inc.	Project Name: 310-058.51
Address: 2025 GATEWAY Pl. #440	UNOCAL Project Manager: TINA Berry
City: SAN JOSE State: CA Zip Code: 95110	AFE #:
Telephone: (408) 441-7500 FAX #: (408) 441-7539	Site #, City, State: 5760 SAN Leandro, CA
Report To: Andrew Lehane Sampler: Don Watterson	QC Data: ☑ Level D (Standard) ☐ Level C ☐ Level B ☐ Level A

Turnaround Time: ☑ 10 Work Days ☐ 5 Work Days ☐ 3 Work Days ☐ 2 Work Days ☐ 1 Work Day ☐ 2-8 Hours

CODE: ☐ Misc. ☐ Detect. ☐ Eval. ☑ Remed. ☐ Demol. ☐ Closure

☐ Drinking Water ☐ Waste Water ☒ Other AIR

Analyses Requested: TPPH-g / BTEX

	Client Sample I.D.	Date/Time Sampled	Matrix Desc.	# of Cont.	Cont. Type	Laboratory Sample #	TPPH-g / BTEX	Comments
1.	INF1 12	9/9/96 12:00	AIR	1	BAG		X	
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								

Relinquished By: Don Watterson	Date: 12/9/96	Time: 14:30	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By Lab:	Date:	Time:

Were Samples Received in Good Condition? ☐ Yes ☐ No Samples on Ice? ☐ Yes ☐ No Method of Shipment_____ Page __ of __

To be completed upon receipt of report:

1) Were the analyses requested on the Chain of Custody reported? ☐ Yes ☐ No If no, what analyses are still needed? _____

2) Was the report issued within the requested turnaround time? ☐ Yes ☐ No If no, what was the turnaround time? _____

Approved by: Signature: Company: Date:

Pink - Client
Yellow - Laboratory
White - Laboratory

MON 11

FIELD SERVICES / O&M REQUEST

Work Order # 5653

SITE INFORMATION FORM

Identification

Project # 310-058.5A

Station # 5760

Site Address: UNOCAL
376 LEWELLING BLVD.
SAN LORENZO

County: ALAMEDA

Project Manager: ANDREW L.

Requestor: STEVE C.

Client: UNOCAL

Project Type

- ☐ 1st Time Visit
- ☒ Quarterly
  - ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th
- ☒ Monthly
- ☒ Semi-Monthly
- ☐ Weekly
- ☐ One time event
- ☐ Other: _____

Client P.O.C.: TINA BERRY

Date of Request _____

Ideal field date(s): _____

Check Appropriate Category

Budget Hrs. _____

Actual Hrs. 1.5 (3.5)

Mob de Mob 2

Field Tasks: For General Description

circle one:
Priority: 1. (emergency, must be done within 24 hrs); 2. (next visit); 3. (when available)

SEMI-MONTHLY: DATA COLLECTION/SYSTEM OPTIMIZATION (SVE & GWE); FILL OUT DATA SHEET

MONTHLY: SVE; - FID READINGS FROM INFL, MID-1, EFFL FOR BAAQMD COMPLIANCE (MUST DO)
- INFL AIR BAG SAMPLE (TO SEQUOIA) FOR TPPH-G & BTEX
GWE; - TAKE INFL & EFFL SAMPLES FOR TPPH-G & BTEX (TO SEQUOIA)
PERFORM REGULAR WATER SEMIMONTHLY TASKS

QUARTERLY: GWE; - TAKE EFFL WATER SAMPLES (TO SEQUOIA) FOR pH, COD, TSS

(TOTAL SUSPENDED SOLIDS IS NON-PRESERVED, PLASTIC <TSS>)
(CHEM. OXYGEN DEMAND IS H_2SO_4 PRESERVED, PLASTIC <COD>)
QUARTERLY = FEB, MAY, AUGUST, NOVEMBER
(REQUEST REVISED 7/24/96 by SMN)

Comments, remarks, etc. from Field Staff (include problems encountered and out-of-scope work)

GWE System filter clogged with some sort of moldy growth or something. Cleaned out screen and changed filter

☐ Samples taken ☒ Samples not required ☐ Soil Vapor ☐ Groundwater

☐ Weekly ☐ Semi-Monthly ☐ Monthly ☐ Quarterly ☐ Semi-Annual

PACIFIC ENVIRONMENTAL GROUP, INC.

Completed by: _____ Date: 12/24/96

Checked by: _____

Soil Vapor and Groundwater Extraction System
Unocal Service Station 5760
376 Lewelling Boulevard
San Lorenzo, California
310-058.5A

Name: Don Waterpaugh Date/Time: 12/24/96 10:30 - 12:00

TREATMENT SYSTEM READINGS

SVE Operational Upon Arrival?	yes
SVE Blower Hour Meter Reading	0394880
Electric Meter (kw-hrs)	10532
Total Vacuum from Wells (" of H20)	32" H_2O
SVE Total Air Flow To Carbon (cfm)	.25" H_2O
Manual Air Dilution Valve Position?	Closed
Post-Dilution SVE Air Flow To Carbon (cfm)	2 .25" H_2O
Bag Filter Pressure (psi). Filt Changed?	55 psi / yes - 10 psi
Was the Oil Changed This Month on Blower?	NO
SVE Influent FID Reading (ppm)	wc woc 5 / 6
SVE Mid FID Reading (ppm)	6 / 7.5
SVE Effluent FID Reading (ppm)	6 / 7

GWS Operational Upon Arrival?	* NO, High pressure IN BAG filter
GWS Totalizer (gallons)	0378260
Liquid Carbon #1 Pressure (psi)	10 psi
Liquid Carbon #2 Pressure (psi)	3.5 psi
GWS Second Cont. Switch Operational?	yes
GWS Effluent Temperature (F)	52.3° F
GWS Effluent pH	7.08 pH

* Changed filter system on & ran

BKgrd - 5/5

Pre filter vacuum - 26" H_2O
Post filter vacuum - 18" H_2O
Well vapor field value open 100%
Recirculation value open ≈ 25-30%

ATTACHMENT D

BIORECLAMATION ASSESSMENT

BIORECLAMATION ASSESSMENT

The remedial approach for this site consists of three primary components: (1) groundwater monitoring, (2) bulk hydrocarbon mass removal using soil vapor extraction (SVE), and (3) in-situ bioreclamation. This attachment discusses the role of bioreclamation in the remedial effort at this site.

Bioreclamation is based on the principal that indigenous bacteria and fungi within the saturated and vadose zones will adapt to the presence of hydrocarbons introduced into their environment, and then use the hydrocarbons as an energy source. In this process, the microorganisms degrade the hydrocarbons by transforming them to end products such as water, carbon dioxide, and biomass. Numerous studies over the past two decades have demonstrated that indicate nearly all petroleum hydrocarbons are biodegradable (Jamison et al., 1975; Atlas, 1981, and 1984; Young, 1984; Bartha, 1986; Barker et al 1987; Lee, 1988; Chiang et al., 1989; Cozzarellie et al., 1990; Leahy and Colewell, 1990; Wilson et al., 1990; Evans et al., 1991; Edwards and Grbic-Galic, 1992 and 1994; Thierrin et al., 1992; Malone et al., 1993; Davis et al., 1994; Borden et. al., 1994; Weidemeier et al., 1995).

The use of SVE and Bioreclamation was specified to address the entire aqueous-phase hydrocarbon plume, as well as impacted soil. SVE is being used primarily to remove the bulk of hydrocarbon mass beneath the site that would otherwise act as a secondary source. However, the use of SVE also enhances the biodegradation of hydrocarbons by increasing the availability of oxygen, the primary electron receptor in aerobic biodegradation. Studies have shown, via mass balance measurements, that approximately half of the biodegradable volatile hydrocarbons removed from soil during SVE is due to physical stripping, while half of the mass removed is attributed to subsurface biodegradation (Schweizer, 1995).

A preponderance of data show that petroleum hydrocarbons have a high tendency to biodegrade in the subsurface environment. Borden (Borden et al., 1993) states that almost all petroleum hydrocarbons are subject to biodegradation in shallow aerobic groundwater. Additionally, Borden points out that biodegradation of petroleum hydrocarbons also takes place under anaerobic conditions, where nitrate, sulfate, and ferric iron are utilized as electron acceptors. It has been PACIFIC's experience at similar sites that oxygen is generally the limiting factor of biodegradation of total purgeable petroleum hydrocarbons quantified as gasoline (TPPH-g), benzene, toluene, ethylbenzene, and xylenes (BTEX compounds) in the

saturated zone. The baseline data for this site also indicates that oxygen is the limiting factor for Bioreclamation.

Concentrations of oxygen and carbon dioxide in soil vapor collected from hydrocarbon-affected areas were typically low for oxygen and high for carbon dioxide, as compared to concentrations observed in ambient air and in soil vapor samples collected from areas not affected by a hydrocarbons. Based on preliminary data, it was stated that oxygen and carbon dioxide in soil vapor samples collected during the SVE test indicated biodegradation was occurring. This observation was based on the carbon dioxide and oxygen levels identified in a soil vapor sample (6.0 percent carbon dioxide, 15 oxygen). Since the time the Remedial Action Plan (RAP) was issued, it was discovered that soil vapor samples collected before the last test day were diluted with ambient air prior to sampling. It is probable that ambient air dilution decreased the true carbon dioxide levels and increased the true oxygen levels contained in extracted soil vapor. Given the circumstances, it is most likely the true concentrations would have strongly indicated biodegradation is occurring.

Baseline dissolved oxygen data indicated the areas of higher dissolved hydrocarbons generally coincided with the areas of lower oxygen concentrations, from which it can be inferred that aerobic microorganisms are utilizing oxygen as the electron acceptor, and degrading the TPPH-g and BTEX compounds present. The addition of the oxygen release compound (ORC) to wells U-6 and U-9 produced a 2 part per million (ppm) increase in dissolved oxygen concentrations in both those wells which has been sustained for nearly a year. The dissolved oxygen concentrations along the leading edge of the plume should be distributed throughout the impacted media via advection and diffusion.

With respect to dissolved petroleum hydrocarbon migration at this site, trends in existing groundwater monitoring data, with respect to time and space, suggest that the long-term rate of hydrocarbon dissolution is equal to the rate of biodegradation, and a quasi-steady state condition is established. In fact, the most recent monitoring data for wells U-6 and U-9 indicated there were no detectable concentrations TPPH-g or BTEX compounds, suggesting that the extent of the dissolved hydrocarbon plume is not only stable, but may be decreasing.

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