

EXXON COMPANY, U.S.A.

P.O. BOX 4032 • CONCORD, CA 94524-4032

MARKETING DEPARTMENT • ENVIRONMENTAL ENGINEERING

MARLA D. GUENSLER
SENIOR ENGINEER

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ENVIRONMENTAL
PROTECTION

96 AUG -1 AM 10: 09

#136

July 30, 1996

Mr. Barney Chan
Alameda County Health Agency, Division of Hazardous Materials
Department of Environmental Health
80 Swan Way, Room 350
Oakland, CA 94621

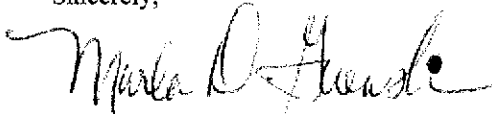
RE: Former Exxon RAS #7-3006/720 High St., Oakland, CA

Dear Mr. Chan:

Attached for your review and comment is a letter report entitled *Quarterly Groundwater Monitoring and Remediation Status Report, Second Quarter 1996* for the above referenced site. This report, prepared by Environmental Resolutions, Inc., of Novato, California, details the results of the groundwater monitoring sampling and remediation sampling events which occurred in the second quarter 1996.

If you have any questions or comments, please contact me at (510) 246-8776.

Sincerely,



Marla D. Guensler
Senior Engineer

MDG/cms

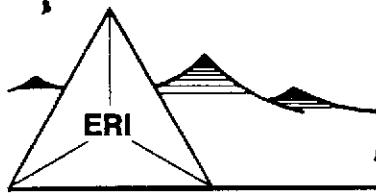
attachment: ERI Report Dated July 25, 1996

cc: w/attachment:

Mr. Kevin Graves - San Francisco Bay Region CRWQCB
Mr. Scott Owen - Bay Area Air Quality Management District
Ms. Sue Jenne' - East Bay Municipal Utility District

w/o attachment:

Mr. Marc Briggs - ERI - Novato



ENVIRONMENTAL RESOLUTIONS, INC.

ENVIRONMENTAL
RESOLUTIONS, INC.
AMID: 09

July 25, 1996
ERI 201013.R06

Ms. Maria Guensler
Exxon Company, U.S.A.
2300 Clayton Road, Suite 640
Concord, California 94524-2032

Subject: Quarterly Groundwater Monitoring and Remediation Status Report, Second Quarter 1996, Former Exxon Service Station 7-3006, 720 High Street, Oakland, California.

Ms. Guensler:

At the request of Exxon Company, U.S.A. (Exxon), Environmental Resolutions, Inc. (ERI) performed remedial activities and groundwater monitoring for the second quarter 1996 at the subject site (Plate 1). The purpose of ongoing remedial activities at the site is to remove residual hydrocarbons from soil and dissolved hydrocarbons from groundwater. The purpose of quarterly monitoring is to evaluate fluctuations in hydrocarbon concentrations in groundwater, to evaluate the capture zone caused by groundwater pumping, and to evaluate the effectiveness of remedial actions.

GROUNDWATER MONITORING AND SAMPLING

On June 19, 1996, ERI measured the depth to water (DTW) in monitoring wells MW1 through MW4, and MW6 through MW15 and subjectively analyzed water in these wells for the presence of liquid phase hydrocarbons. Monitoring well MW5 was previously destroyed. No measurable liquid phase hydrocarbons or sheen were observed on groundwater from wells MW1, MW7, MW9 through MW11, and MW14. Monitoring wells MW2 through MW4, MW6, MW8, MW12, MW13, and MW15 had a sheen and therefore were not purged or sampled. ERI's groundwater sampling protocol is attached (Attachment A).

The groundwater appears to flow southwest beneath the site with an approximate gradient ranging from 0.009 to 0.034 (Plate 2). Monitoring and sampling data for 1994 through 1996 are summarized in Table 1.

Laboratory Analyses and Results

Groundwater samples were submitted to Sequoia Analytical (California State Certification Number 1210) in Redwood City, California, under chain of custody protocol. The samples were analyzed for total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene, total xylenes (BTEX), methyl tert-butyl ether (MTBE), total extractable petroleum hydrocarbons as diesel (TEPHd), extractable hydrocarbons as stoddard solvent (TPHss) and purgeable halocarbons. The specific methods of analysis are listed in the notes in Table 1. The results of analysis are listed in Table 1 and are shown on Plate 2. The laboratory analysis reports and chain of custody records are attached (Attachment B).

SOIL AND GROUNDWATER REMEDIATION

Air-Sparging/Soil Vapor-Extraction

ERI initiated operation of the air-sparging/soil vapor-extraction system (AS/VES) in January 1995 utilizing carbon abatement. Vapor samples were collected daily through January 18, 1995. ERI submitted a Source Test Report (dated January 20, 1995) to the Bay Area Air Quality Management District (BAAQMD) requesting the vapor monitoring schedule be revised. The BAAQMD approved a revised monitoring schedule to bi-weekly in their letter dated January 30, 1995. The system was shutdown on March 25, 1996 pending replacement of carbon abatement with a Thermtch VAC-25 thermal oxidizer and obtaining a new BAAQMD permit. The AS/VES did not operate during the second quarter 1996. Cumulative operational and performance data are presented in Table 2.

The AS/VES currently consists of six air-sparging wells for air injection, vadose wells for vapor extraction, a water knock-out tank, a Thermtch VAC-25 thermal/oxidizer, and a propane tank for supplemental fuel. Additionally, the system is equipped with a high liquid level shutdown to turn the system off if the water level in the knock-out tank reaches the specified level. The AS/VES is operated in a continuous mode.

Groundwater Extraction And Treatment

The groundwater remediation system (GRS) is designed to treat separate-phase and dissolved petroleum hydrocarbons in groundwater extracted from the interceptor trench beneath the site. Pneumatic pumps are installed in extraction wells RW2 and RW5 to recover groundwater from the interceptor trench. Subsurface and above-ground collection piping are used to transfer extracted groundwater to a holding tank. A transfer pump and poly-vinyl chloride (PVC) piping are used to direct the water stream from the holding tank through water filters, an airstripper, and subsequently through liquid-phase granular activated carbon (GAC) canisters connected in series. The treated groundwater is discharged to the sanitary sewer regulated by East Bay Municipal Utilities District (EBMUD). The system was shutdown on March 25, 1996 pending replacement of carbon abatement with a Thermtch VAC-25 thermal oxidizer.

No groundwater was discharged during the second quarter 1996. System flow rates, total volume extracted, and influent, intermediate, and effluent sample concentrations are presented in Table 3.

SUMMARY AND STATUS OF INVESTIGATION

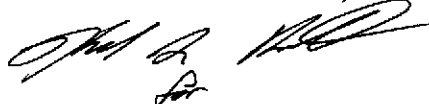
Based on data collected to date, ERI removed the carbon abatement unit in the second quarter and installed a Thermtch VAC-25 thermal oxidizer at the site to allow for an increase in the hydrocarbon removal rate. The AS/SVE and groundwater extraction systems are currently non-operational pending approval to initiate operation from BAAQMD. ERI anticipates beginning operation during the third quarter 1996 and will continue to operate the remedial systems and monitor groundwater at the site upon start-up.

LIMITATIONS

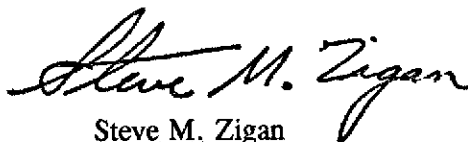
This report was prepared in accordance with generally accepted standards of environmental geological practice in California at the time this investigation was performed. This report has been prepared for Exxon Company, U.S.A. and any reliance on this report by third parties shall be at such party's sole risk.

If you have any questions or comments regarding this report, please call (415) 382-5991.

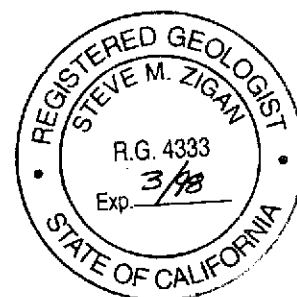
Sincerely,
Environmental Resolutions, Inc.



Marc A. Briggs
Project Manager



Steve M. Zigan
R.G. 4333
H.G. 133



- Enclosures:
- Table 1: Cumulative Groundwater Monitoring and Sampling Data
 - Table 2: Cumulative Hydrocarbon Removal and Emissions for Soil Vapor Extraction System
 - Table 3: Operation and Performance Data for Groundwater Remediation System

 - Plate 1: Site Vicinity Map
 - Plate 2: Generalized Site Plan

 - Attachment A: Groundwater Sampling Protocol
 - Attachment B: Laboratory Analysis Reports and Chain of Custody Records
 - Attachment C: ERI SOP-25 "Hydrocarbons Removed from a Vadose Well"

TABLE I
 CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
 Former Exxon Service Station 7-3006
 720 High Street
 Oakland, California
 (Page 1 of 6)

Well ID # (TOC)	Sampling Date	SUBJ <	DTW feet	Elev.		TPHg	B	T	E	X	MTBE	TEPHd	VOCs >
				>	<								
MW1 (12.87)	1/20/94	NLPH	9.25	3.62									
	02/02-03/94	NLPH	8.60	4.27	<50	<0.5	<0.5	<0.5	0.7	NA	70	NA	
	3/10/94	NLPH	8.31	4.56									
	4/22/94	NLPH	7.95	4.92									
	05/10-11/94	NLPH	7.48	5.39	<50	<0.5	<0.5	<0.5	1.6	NA	100	NA	
	6/27/94	NLPH	7.65	5.22									
	8/31/94	NLPH	9.39	3.48									
	9/29/94	NLPH	9.83	3.04	<50	<0.5	<0.5	<0.5	<0.5	NA	<50	NA	
	10/25/94	NLPH	10.19	2.68	<50	<0.5	<0.5	<0.5	<0.5	<50	NA	NA	
	11/30/94	NLPH	8.97	3.90									
	12/27/94	NLPH	7.44	5.43									
	2/6/95	NLPH	5.71	7.16	<50	0.52	<0.5	<0.5	<0.5	100	NA	NA	
	6/7/95	NLPH	7.62	5.25	<50	<0.5	<0.5	<0.5	<0.5	3.5	81	NA	
	9/18/95	NLPH	10.02	2.85	<50	<0.5	<0.5	<0.5	<0.5	6	82	NA	
	11/1/95	NLPH	10.74	2.13	<50	<0.5	<0.5	<0.5	<0.5	8.9	160	NA	
	2/14/96	NLPH	7.81	5.06	<50	<0.5	<0.5	<0.5	<0.5	7.8	100	NA	
	6/19/96	NLPH	7.47	5.40	<50	<0.5	<0.5	<0.5	<0.5	7.1	93	NA	
				Additional EHCss		<50							
	MW2 (12.98)	1/20/94	NM [NR]	NM									
		02/02-03/94	NM [NR]	NM									
3/10/94		[8 c.]		6.96	6.02								
4/22/94		[10 c.]	NM										
05/10-11/94		[5 c.]	NM										
6/27/94		Sheen		7.10	5.88								
8/31/94		Sheen		8.58	4.40								
9/29/94		Sheen		9.11	3.87								
10/25/94		Sheen		7.76	5.22								
11/30/94		NM		7.33	5.65								
12/27/94		Sheen		6.77	6.21								
2/6/95		Sheen		5.00	7.98								
6/7/95		Sheen		7.14	5.84								
9/18/95		Sheen		10.82	2.16								
11/1/95		Sheen		11.65	1.33								
2/14/96		Sheen		8.39	4.59								
6/19/96	Sheen		6.55	6.43									
MW3 (12.92)	1/20/94	Sheen		8.24	4.68								
	02/02-03/94	Sheen		7.68	5.24								
	3/10/94	Sheen		7.24	5.68								
	4/22/94	Sheen		6.79	6.13								
	05/10-11/94	Sheen		6.43	6.49								
	6/27/94	0.01 [NR]		6.97	5.95								
	8/31/94	Sheen		8.41	4.51								
	9/29/94	Sheen		8.97	3.95								
	10/25/94	Sheen		9.43	3.49								
	11/28/94	NM		7.19	5.73								
	12/27/94	Sheen		6.64	6.28								
	2/6/95	Sheen		4.87	8.05								
	6/7/95	Sheen		7.05	5.87								
	9/18/95	Sheen		10.61	2.31								
	11/1/95	Sheen		11.58	1.34								
	2/14/96	Sheen		8.34	4.58								
6/19/96	Sheen		6.35	6.57									

TABLE 1
 CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
 Former Exxon Service Station 7-3006
 720 High Street
 Oakland, California
 (Page 2 of 6)

Well ID # (TOC)	Sampling Date	SUBJ <	DTW feet	Elev. > <	TPHg	B	T	E	X	MTBE	TEPHd	VOCs >
parts per billion												
MW4 (12.77)	1/20/94	NM [NR]	NM	---								
	02/02-03/94	NM [1 c.]	NM	---								
	3/10/94	[8 c.]	7.12	5.65								
	4/22/94	[10 c.]	NM	---								
	05/10-11/94	[5 c.]	NM	---								
	6/27/94	0.01 [NR]	6.50	6.27								
	8/31/94	0.02 [NR]	7.84	4.93								
	9/29/94	0.03 [NR]	8.43	4.34								
	10/25/94	Sheen	9.24	3.53								
	11/30/94	NM	6.77	6.00								
	12/27/94	Sheen	6.14	6.63								
	2/6/95	Sheen	4.87	7.90								
	6/7/95	Sheen	6.91	5.86								
	9/18/95	Sheen	9.59	3.18								
	11/1/95	Sheen	11.52	1.25								
	2/14/96	Sheen	8.56	4.21								
	6/19/96	Sheen	6.09	6.68								
MW5	7/18/89		Well Destroyed									
MW6 (14.27)	1/20/94	NM [NR]	NM	---								
	02/02-03/94	NM [NR]	NM	---								
	3/10/94	[¼ c.]	7.82	6.45								
	4/22/94	[10 c.]	NM	---								
	05/10-11/94	[3 c.]	NM	---								
	6/27/94	Sheen	7.77	6.50								
	8/31/94	Sheen	9.02	5.25								
	9/29/94	Sheen	9.51	4.76								
	10/25/94	Sheen	9.93	4.34								
	11/30/94	NM	8.05	6.22								
	12/27/94	NM	7.54	6.73								
	2/6/95	Sheen	5.86	8.41								
	6/7/95	Sheen	8.07	6.20								
	9/18/95	Sheen	10.54	3.73								
	11/1/95	Sheen	11.41	2.86								
	2/14/96	Sheen	9.17	5.10								
	6/19/96	Sheen	7.13	7.14								
MW7 (14.84)	1/20/94	NLPH	8.67	6.17								
	02/02-03/94	NLPH	8.47	6.37	2,900	79	5	8.2	21	NA	1,300	NA
			Additional Analysis TOG:		4701							
	3/10/94	NLPH	8.24	6.60								
	4/22/94	NLPH	7.95	6.89								
	05/10-11/94	NLPH	7.53	7.31	2,400	88	5.6	5.2	15	NA	1,300	NA
			Additional Analysis TOG:		1,400							
	6/27/94	NLPH	8.01	6.83								
	8/31/94	NLPH	9.19	5.65								
	9/29/94	NLPH	9.65	5.19	1,900	71	3.1	3.5	7.8	NA	56	NA
	10/25/94	NLPH	9.96	4.88	1,400	51	1.5	24	6.8	NA	89	NA
	11/30/94	NM	7.78	7.06						NA		
	12/27/94	NM	7.51	7.33								
	2/6/95	NLPH	5.79	9.05	2,500	130	<10	<10	<10	NA	1,300	ND
			Additional Analysis EHCss		1,100							
	6/7/95	NLPH	7.73	7.11	2,400	91	5	7.6	14	39	1,200	NA
			Additional Analysis EHCss		1,000							

TABLE 1
 CUMULATIVE GROUNDWATER MONITORING AND SAMPLING DATA
 Former Exxon Service Station 7-3006
 720 High Street
 Oakland, California
 (Page 6 of 6)

Well ID # (TOC)	Sampling Date	SURJ <	DTW feet	Elev. > <	TPHg	B	T	E	X	MTBE	TEPHd	VOCs >
								parts per billion				
MW15 (13.73)	1/20/94	NLPH	7.48	6.25								
	02/02-03/94	NLPH	7.30	6.43	4,300	24	6.7	170	26	NA	1,200	NA
	3/10/94	NLPH	7.32	6.41								
	4/22/94	NLPH	6.67	7.06								
	05/10-11/94	NLPH	5.81	7.92	3,900	16	<0.5	150	13	NA	1,400	NA
	6/27/94	NLPH	6.14	7.59								
	8/31/94	NLPH	7.20	6.53								
	9/29/94	NLPH	7.76	5.97	2,500	51	15	48	3.6	NA	420	NA
	10/25/94	Sheen	8.19	5.54								
	11/30/94	NM	8.57	5.16								
	12/27/94	NLPH	6.49	7.24								
	2/6/95	Sheen	4.97	8.76								
	6/7/95	Sheen	7.14	6.59								
	9/18/95	Sheen	9.00	4.73								
	11/1/95	Sheen	10.67	3.06								
	2/14/96	Sheen	7.27	6.46								
	6/19/96	Sheen	6.65	7.08								

Notes:

- SUBJ = Results of subjective evaluation, liquid-phase hydrocarbon thickness (HT) in feet
- NLPH = No liquid phase hydrocarbons present in well
- TOC = Elevation of top of well casing; relative to mean sea level
- DTW = Depth to water
- Elev. = Elevation of groundwater. If liquid-phase hydrocarbons present, elevation adjusted using TOC - [DTW - (PT x 0.8)].
- [] = amount recovered
- gal. = gallons
- c. = cups
- TPHg = Total petroleum hydrocarbons as gasoline analyzed using modified EPA method 5030/8015.
- BTEX = Benzene, Toluene, Ethylbenzene, and total Xylenes analyzed using EPA method 5030/8020.
- TEPHd = Total extractable petroleum hydrocarbons as diesel analyzed using modified EPA method 3510/8015.
- MTBE = Methyl tert-butyl ether analyzed using modified EPA method 5030/8020.
- VOCs = Volatile organic compounds/purgable halocarbons analyzed using EPA method 601.
- TOG = Total oil and grease analyzed using Standard Method 5520.
- NR = No liquid-phase hydrocarbons removed from well
- NM = Not Measured
- ND = Not Detected at or above the laboratory method detection limits
- NA = Not Analyzed
- = Not Applicable
- EHC_{ss} = Extractable Hydrocarbons as Stoddard Solvent analyzed using EPA method 8015.
- < = Less than the indicated detection limit shown by the laboratory
- 1 = A peak eluting earlier than benzene and suspected to be methyl tert-butyl ether was present

TABLE 2
 CUMULATIVE HYDROCARBON REMOVAL AND EMISSIONS FOR
 SOIL VAPOR EXTRACTION SYSTEM
 Former Exxon Service Station 7-3006
 720 High Street
 Oakland, California
 Page 1 of 5

2010DATA.XLS
 Revision: 7/19/96

DATE	SAMPLE ID	TEMP deg F	PRESS in H2O	AIR FLOW cu ft/min	HC Inf ppmv	HC Eff ppmv	HC Inf Conc* mg/cu M	LB HC for Period	LB HC Cumulative	Benzene Inf Conc* mg/cu M	LB Benzene per Period	LB Benzene Cumulative	LB Benzene Emitted per Day
1/9/95	A-INF	70		160			210			39			
	A-INT						< 10			< 0.1			
	A-EFF						< 10			< 0.1			
1/10/95	A-INF	70		160			110	2.30	2.3	22	0.44	0.4	
	A-INT						< 10			< 0.1			
	A-EFF						< 10			< 0.1			< 0.0014
1/11/95	A-INF	70		160			70	1.29	3.6	12	0.24	0.7	
	A-INT						< 10			< 0.1			
	A-EFF						< 10			< 0.1			< 0.0014
1/12/95	A-INF	70		160				0.57	4.2		0.09	0.8	
	A-INT						< 10			< 0.1			
	A-EFF						< 10			< 0.1			< 0.0014
1/13/95	A-INF	70		160				0.14	4.3		0.00	0.8	
	A-INT						< 10			< 0.1			
	A-EFF						< 10			< 0.1			< 0.0014
1/14/95	A-INF	70		160				0.14	4.5		0.00	0.8	
	A-INT						< 10			< 0.1			
	A-EFF						< 10			< 0.1			< 0.0014
1/15/95	A-INF	70		158				0.14	4.6		0.00	0.8	
	A-INT						< 10			< 0.1			
	A-EFF						< 10			< 0.1			< 0.0014
1/16/95	A-INF	70		151			10	0.14	4.7		0.00	0.8	
	A-INT						< 10			< 0.1			
	A-EFF						< 10			< 0.1			< 0.0014
1/17/95	A-INF	70		155				0.14	4.9	0.13	0.00	0.8	
	A-INT						< 10			< 0.1			
	A-EFF						< 10			< 0.1			< 0.0014
1/18/95	A-INF	70		155			100	0.77	5.6	12	0.08	0.9	
	A-INT						< 10			< 0.1			
	A-EFF						< 10			< 0.1			< 0.0014
1/19/95		70		155	15	0	68	1.17	6.8				
1/20/95		70		155	14.4	0	66	0.93	7.7				

TABLE 2
 CUMULATIVE HYDROCARBON REMOVAL AND EMISSIONS FOR
 SOIL VAPOR EXTRACTION SYSTEM
 Former Exxon Service Station 7-3006
 720 High Street
 Oakland, California
 Page 2 of 5

DATE	SAMPLE ID	TEMP deg F	PRESS in H2O	AIR FLOW cu ft/min	HC Inf ppmv	HC Eff ppmv	HC Inf Conc* mg/cu M	LB HC for Period	LB HC Cumulative	Benzene Inf Conc* mg/cu M	LB Benzene per Period	LB Benzene Cumulative	LB Benzene Emitted per Day
2/1/95	A-INF	70		147			39	13.19	20.9	3.5	1.47	2.3	
	A-INT						< 10			< 0.1			< 0.0013
	A-EFF						< 10			< 0.1			
2/14/95		70		147									
2/17/95		70		155	9	0	41	8.67	29.6				
2/27/95		70		151									
3/13/95	A-INF	70		176			< 10	14.21	43.8	0.42	1.14	3.5	
	A-INT						< 10			< 0.1			< 0.0016
	A-EFF						< 10			< 0.1			
3/31/95		70		116	2.3	0	10	2.01	45.8				
4/4/95		70		84	129	0.8	587	76.68	122.5				
4/12/95	A-INF	70		176			95	24.88	147.4	6.4	1.62	5.1	
	A-INT						< 10			0.38			< 0.0016
	A-EFF						< 10			< 0.1			
4/19/95	A-INF	70		109			210	13.65	161.0	7.6	0.63	5.7	
	A-INT						47			12			< 0.0010
	A-EFF						< 10			< 0.1			
4/20/95	Replaced 2 ea x 500 lb canisters = 1000 lbs of Carbon												
4/26/95	A-INF	70		84			400	18.49	179.5	9.1	0.64	6.4	
	A-INT						< 10			< 0.1			< 0.0008
	A-EFF						< 10			< 0.1			
5/1/95	Installed third 500 lb canister in series												
5/1/95	A-INF	70		168			Insufficient sample for analyses				< 0.1		
	A-INT						< 10			< 0.1			< 0.0015
	A-EFF						< 10			< 0.1			
5/15/95		70		84									
5/19/95	A-INF	70		105			140	52.68	232.2	3.5	1.23	7.6	
	A-INT						< 10			< 0.1			< 0.0009
	A-EFF						< 10			< 0.1			
6/6/95	A-INF	70		178			36	20.12	252.3	0.22	0.53	8.1	
	A-INT						< 10			0.1			< 0.0016
	A-EFF						< 10			< 0.1			
6/8/95		70		164									
6/23/95	System Down - hydrocarbon vapor detector shut down												
6/27/95	Replaced one 500 lb carbon canister												

TABLE 2
 CUMULATIVE HYDROCARBON REMOVAL AND EMISSIONS FOR
 SOIL VAPOR EXTRACTION SYSTEM
 Former Exxon Service Station 7-3006
 720 High Street
 Oakland, California
 Page 3 of 5

DATE	SAMPLE ID	TEMP deg F	PRESS in H2O	AIR FLOW cu ft/min	HC Inf ppmv	HC Eff ppmv	HC Inf Conc* mg/cu M	LB HC for Period	LB HC Cumulative	Benzene Inf Conc* mg/cu M	LB Benzene per Period	LB Benzene Cumulative	LB Benzene Emited per Day
6/27/95	A-INF	70		164			440	76.72	329.0	4.9	0.83	8.9	
	A-INT						< 10			< 0.1			< 0.0015
	A-EFF						< 10			< 0.1			
7/3/95	A-EFF						< 10			< 0.1			
7/10/95	Replaced one 500 lb carbon canister												
7/10/95	A-INF	70		168			230	64.89	393.9	2.8	0.75	9.7	
	A-INT						120			2.8			
	A-EFF						< 10			< 0.1			< 0.0015
7/19/95	Replaced 2 ea x 500 lb canisters = 1000 lbs of Carbon												
7/25/95	Collect samples and shut system down pending results												
7/25/95	A-INF	70		205			67	37.29	431.2	< 0.5	0.41	10.1	
	A-INT						< 100			< 1			< 0.0018
	A-EFF						< 10			< 0.1			
7/28/95	System down - could not restart												
7/31/95	Restart system												
7/31/95	A-INF	70		164			500	28.17	459.4	14	0.72	10.8	
	A-INT						12			< 0.1			< 0.0015
	A-EFF						< 10			< 0.1			
8/9/95	Replaced one 500 lb carbon canister												
8/15/95	System down - Remove hydrocarbon vapor detector and send to manufacture for calibration												
9/11/95	Replaced hydrocarbon vapor detector - Restarted system												
9/13/95	System Down - hydrocarbon vapor detector shut down												
9/18/95	Replaced 2 ea x 500 lb canisters = 1000 lbs of carbon												
9/18/95	A-INF	70		164			980	196.08	655.5	13	3.58	14.4	
	A-INT						< 10			< 0.1			< 0.0015
	A-EFF						< 10			< 0.1			
9/20/95	System Down - hydrocarbon vapor detector shut down												
9/25/95	Restarted system												
9/25/95	A-INF	70		164			NA			2.4			
	A-INT						NA			< 0.1			
	A-EFF						NA			< 0.1			

TABLE 2
 CUMULATIVE HYDROCARBON REMOVAL AND EMISSIONS FOR
 SOIL VAPOR EXTRACTION SYSTEM
 Former Exxon Service Station 7-3006
 720 High Street
 Oakland, California
 Page 4 of 5

DATE	SAMPLE ID	TEMP deg F	PRESS in H2O	AIR FLOW cu ft/min	HC Inf ppmv	HC Eff ppmv	HC Inf Conc* mg/cu M	LB HC for Period	LB HC Cumulative	Benzene Inf Conc* mg/cu M	LB Benzene per Period	LB Benzene Cumulative	LB Benzene Emited per Day
10/13/95	Replaced 2 ea x 500 lb canisters = 1000 lbs of carbon												
10/13/95	A-INF	70		168			2000	444.04	1,099.5	100	16.84	31.2	
	A-INT						< 10			< 0.05			
	A-EFF						< 10			< 0.05			< 0.0008
10/26/95	Replaced 2 ea x 500 lb canisters = 1000 lbs of carbon												
10/26/95		70		168	165	0	751	269.69	1,369.2				
11/6/95	Replaced 2 ea x 500 lb canisters = 1000 lbs of carbon												
11/20/95	A-INF1	70		170			180	176.60	1,545.8	3.6	1.04	32.3	
11/20/95	A-INF2						82			2			
	A-INT						< 10			< 0.1			
	A-EFF						< 10			< 0.1			< 0.0015
11/26/95	System down												
12/4/95	Restart system	70		168	18.5	0.5	84	12.03	1,557.8				
12/18/95	A-INF	70		151			4600	469.45	2,027.3	50	10.10	42.4	
	A-INT						< 10			< 0.1	0.00	42.4	
	A-EFF						< 10			< 0.1			< 0.0014
1/2/96		70		147	51.7	8.2	235	485.04	2,512.3				
1/3/96	Shut system down, pending carbon change out												
1/8/96	changed out three carbon beds, #1, #2, #3				two carbon beds in-line								
1/8/96		70		151.2	105.4	0	480	28.72	2,541.0				
1/16/96	A-INF	70		142.8	62.3	0	180	7.50	2,548.5	< 0.1	0.00	42.4	
	A-EFF									< 0.1			< 0.0013
1/30/96		70		147	50.4	0	230	37.28	2,585.8				
2/14/96	A-INF	72		147	39.7	0	< 10	0.49	2,586.3	0.16	0.02	42.4	
	A-EFF						< 10			< 0.1			< 0.0013
2/27/96		70		136.5	1	0	5	1.20	2,587.5				
3/12/96	A-INF	70		136.5	2.2	0	< 10	1.25	2,588.8	< 0.1	0.02	42.4	
	A-EFF						< 10			< 0.1			< 0.0012

TABLE 2
CUMULATIVE HYDROCARBON REMOVAL AND EMISSIONS FOR
SOIL VAPOR EXTRACTION SYSTEM
 Former Exxon Service Station 7-3006
 720 High Street
 Oakland, California
 Page 5 of 5

DATE	SAMPLE ID	TEMP deg F	PRESS in H2O	AIR FLOW cu ft/min	HC Inf ppmv	HC Eff ppmv	HC Inf Conc* mg/cu M	LB HC for Period	LB HC Cumulative	Benzene Inf Conc* mg/cu M	LB Benzene per Period	LB Benzene Cumulative	LB Benzene Emitted per Day
3/25/96	A-INF A-EFF	70		147	2.4	0	< 10 < 10	1.65	2,590.4	< 0.1 < 0.1	0.17	42.6	< 0.0013
3/25/96	System shutdown and prepared installation of thermal oxidizer												

Notes:

A-INF	= Air Influent	A-INF1	= Air Influent before stripper	HC	= Hydrocarbon
A-INT	= Air Intermediate	A-INF2	= Air Influent after stripper	ug/l	= micrograms per liter
A-BFF	= Air Effluent			mg/cuM	= milligrams per cubic meter
NA	= Not Analyzed			lb	= pounds
				acfm	= actual cubic feet per minute
				<	= less than the laboratory method detection limit

*If value is below laboratory detection limit, detection limit value is used.

*Values calculated using ERI SOP-25 "Hydrocarbons Removed from a Vadose Well" (Attachment C)

TABLE 3
OPERATION AND PERFORMANCE DATA FOR
GROUNDWATER REMEDIATION SYSTEM

Former Exxon Service Station, 7-3006

720 High Street

Oakland, California

Page 1 of 5

Revised 7/19/96

Date	Total Flow [gal]	Average Flowrate [gpd]	Sample ID	Analytical Data					TPHg Removed		Benzene Removed		
				TPHg [ug/l]	B [ug/l]	T [ug/l]	E [ug/l]	X [ug/l]	Arsenic [mg/l]	Per Period [lb]	Cumulative [lb]	Per Period [lb]	Cumulative [lb]
1/9/95	0		W-INF	3400	630	190	100	460	NA				
	--	--	W-INT	<50	<0.5	<0.5	<0.5	<0.5	NA				
	--	--	W-EFF	<50	<0.5	<0.5	<0.5	<0.5	0.0076				
1/10/95	--	--	--	--	--	--	--	--	--				
1/11/95	795	398	--	--	--	--	--	--	--				
1/13/95	1065	135	System shut down pending EBMUD arsenic revision (discharge limit of 0.0012 ppm)										
1/23/95	1065	0	--	--	--	--	--	--	--				
2/13/95	1065	0	--	--	--	--	--	--	--				
2/14/95	1065	0	--	--	--	--	--	--	--				
2/17/95	1065	0	--	--	--	--	--	--	--				
2/27/95	1065	0	--	--	--	--	--	--	--				
3/7/95	1065	0	EBMUD arsenic revision (discharge limit of 0.05 ppm)										
3/13/95	10800	1623	W-INF	110	7.4	0.5	0.53	6	NA	0.1581	0.1581	0.0287	0.0287
			W-INT	<50	<0.5	<0.5	<0.5	<0.5	NA				
			W-EFF	<50	<0.5	<0.5	<0.5	<0.5	<0.005				
3/21/95	11660	108	W-INF	<50	4.5	<0.5	<0.5	5.5	NA	0.0006	0.1587	0.0000	0.0288
			W-INT	<50	<0.5	<0.5	<0.5	<0.5	NA				
			W-EFF	<50	<0.5	<0.5	<0.5	<0.5	0.0059				
			System shut down - 55-gallon liquid phase carbon canister (leak)										
3/30/95	11760	11	Replaced one 55-gallon liquid phase carbon canister (leak)										
4/4/95	11760		Replaced one 55-gallon liquid phase carbon canister (leak) - Started system										
4/4/95	12660	180	W-INF	220	66	11	4.8	16	NA	0.0011	0.1598	0.0003	0.0291
			W-INT	<50	<0.5	<0.5	<0.5	<0.5	NA				
			W-EFF	<50	<0.5	<0.5	<0.5	<0.5	0.0096				

**TABLE 3
OPERATION AND PERFORMANCE DATA FOR
GROUNDWATER REMEDIATION SYSTEM**

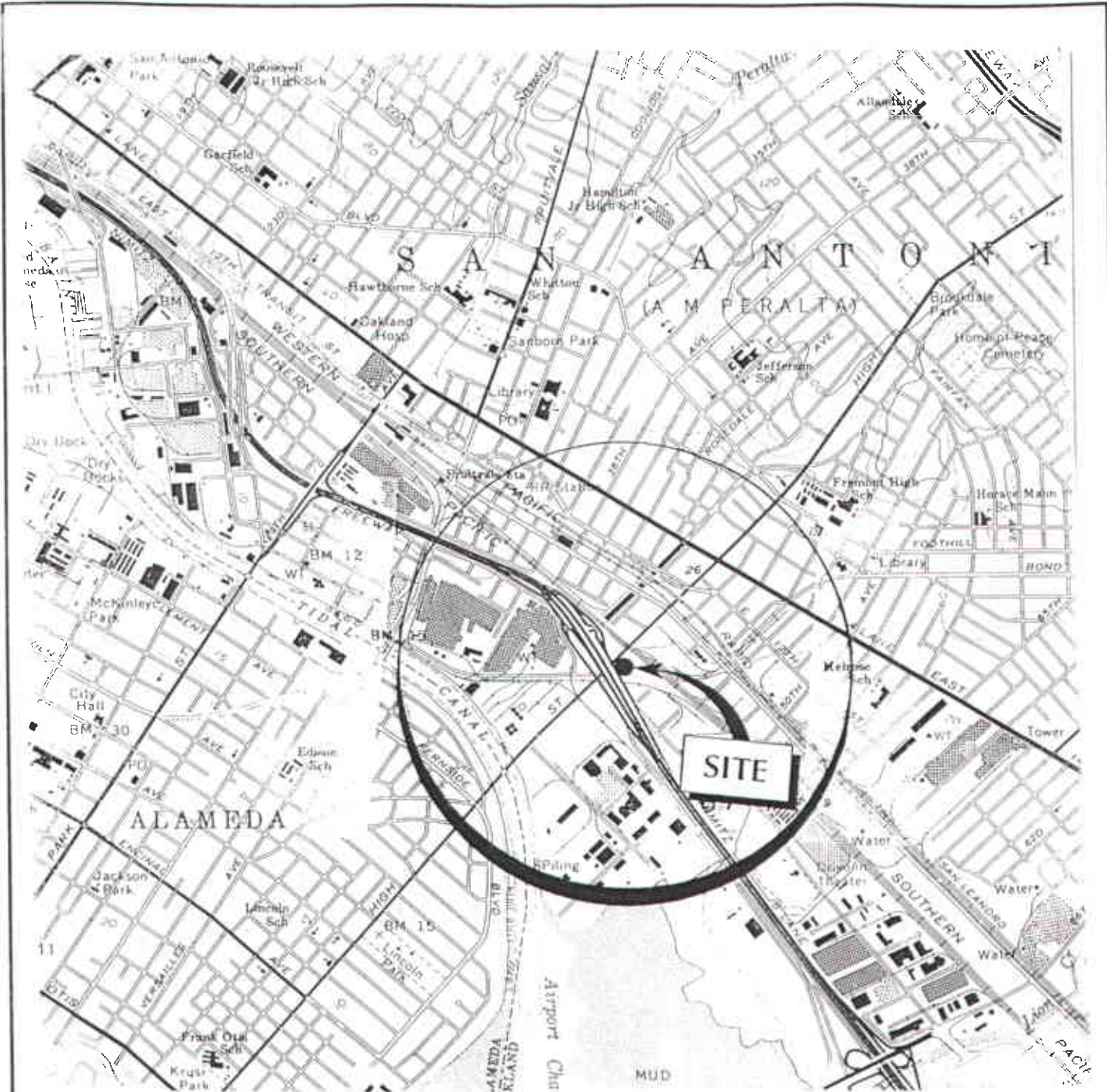
Former Exxon Service Station, 7-3006

720 High Street

Oakland, California

Page 4 of 5

Date	Total Flow [gal]	Average Flowrate [gpd]	Sample ID	Analytical Data						TPHg Removed		Benzene Removed	
				TPHg [ug/l]	B [ug/l]	T [ug/l]	E [ug/l]	X [ug/l]	Arsenic [mg/l]	Per Period [lb]	Cumulative [lb]	Per Period [lb]	Cumulative [lb]
11/20/95	139664	126	W-INF1	630	140	<5.0	6.9	22	NA	0.1911	1.9108	0.0532	0.5404
			W-INF2	230	36	1.6	2.2	7.6	NA				
			W-INT	<50	<0.5	<0.5	<0.5	<0.5	NA				
			W-BFF	<50	<0.5	<0.5	<0.5	<0.5	NA				
11/27/95			System Down										
11/29/95	160361	77	Restart System										
12/4/95	161442	216											
12/18/95	168304	490	W-INF1	8900	1100	240	130	2200	NA	0.3435	2.2543	0.0447	0.5851
			W-INF2	3900	380	85	60	890	NA				
			W-INT	<50	1.3	<0.5	<0.5	5.1	NA				
			W-BFF	<50	<0.5	<0.5	<0.5	<0.5	NA				
1/2/96	171770	231											
1/8/96	173707	323											
1/16/96	178573	608	W-INF	490	53	1.8	3.9	35	NA	0.4023	2.6566	0.0038	0.5889
			W-INF2	150	8.1	<0.5	0.61	6.8	NA				
			W-INT	<50	<0.5	<0.5	<0.5	<0.5	NA				
			W-EFF	<50	<0.5	<0.5	<0.5	<0.5	NA				
1/30/96	190030	818											
2/14/96	202610	839	W-INF1										
			W-INF2										
			W-INT										
			W-EFF										
2/27/96	216100	1038											
3/12/96	SYSTEM DOWN UPON ARRIVAL												
3/12/96	216590	35	W-INF1	1700	410	110	26	130	NA	0.3473	3.0039	0.0734	0.6624
			W-INF2	420	94	24	5.9	33	NA				
			W-INT	<50	0.53	<0.5	<0.5	<0.5	NA				
			W-BFF	<50	<0.5	<0.5	<0.5	<0.5	NA				



20100001



APPROXIMATE SCALE



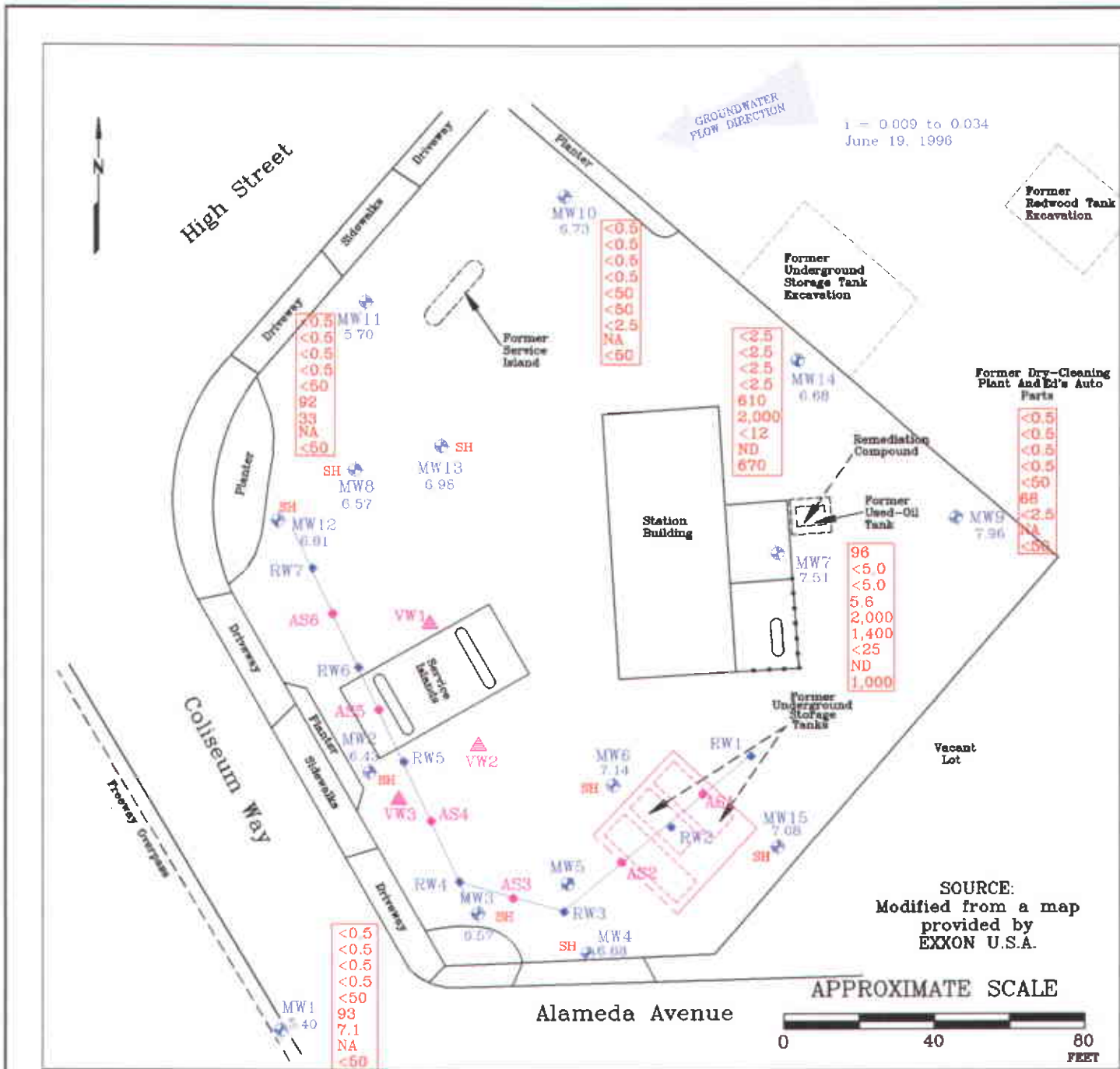
Source: U.S.G.S. 7.5 minute topographic quadrangle map Oakland/San Leandro, California Photorevised 1980



PROJECT ERI 2010

SITE VICINITY MAP
 FORMER EXXON SERVICE STATION 7-3006
 720 High Street
 Oakland, California

PLATE
 1



FN 20100002

EXPLANATION

- MW15 Groundwater Monitoring Well
7.08 Groundwater elevation in feet above mean sea level
- MW5 Groundwater Monitoring Well (Destroyed)
- VW3 Vapor Well
- RW7 Recovery Monitoring Well
- Interceptor Trench
- AS6 Air-Sparging/Vapor-Extraction Well

i = Interpreted gradient magnitude

Groundwater Concentrations in ug/L
Sampled June 19, 1996

96	Benzene	ND	=	Not Detected
<5.0	Toluene	NA	=	Not Analyzed
<5.0	Ethylbenzene	SH	=	Sheen
5.6	Xylene			
96	Total Petroleum Hydrocarbons as gasoline			
1,400	Total Extractable Petroleum Hydrocarbons as diesel			
<25	Methyl tert-butyl ether			
ND	Volatile Organic Compounds			
1,000	Extractable Hydrocarbons as Stoddard Solvent			



GENERALIZED SITE PLAN

FORMER EXXON SERVICE STATION 7-3006
720 High Street
Oakland, California

PROJECT NO.

2010

PLATE

2

DATE: 7/17/96

ATTACHMENT A
GROUNDWATER SAMPLING PROTOCOL

GROUNDWATER SAMPLING PROTOCOL

The static water level and separate phase product level, if present, in each well that contained water and/or separate phase product are measured with a ORS Interface Probe, which is accurate to the nearest 0.01 foot. To calculate groundwater elevations and evaluate groundwater gradient, depth to water (DTW) levels are subtracted from wellhead elevations.

Water samples collected for subjective evaluation are collected by gently lowering approximately half the length of a clean Teflon[®] bailer past the air-water interface (if possible) and collecting a sample from near the surface of the water in the well. The samples were checked for measurable separate phase hydrocarbon product or sheen. Any separate phase product is removed from the well.

Before water samples are collected from the groundwater monitoring wells, the wells are purged until stabilization of the temperature, pH, and conductivity are obtained. Water samples from the wells that do not obtain stability of the temperature, pH, and conductivity are considered to be "grab samples". The quantity of water purged from each well is calculated as follows:

1 well casing volume = $\pi r^2 h (7.48)$ where:

- r = radius of the well casing in feet.
- h = column of water in the well in feet (depth to bottom - depth to water)
- 7.48 = conversion constant from cubic feet to gallons

gallons of water purged/gallons in 1 well casing volume = well casing volumes removed.

After purging, each well was allowed to recharge to at least 80% of the initial water level. Water samples from wells that do not recover to at least 80% (due to slow recharging of the well) between purging and sampling are considered to be "grab samples". Water samples were collected with a new, disposable Teflon bailer, and were carefully poured into 40-milliliter (ml) glass vials, which are filled so as to produce a positive meniscus. Each vial is preserved with hydrochloric acid, sealed with a cap containing a Teflon[®] septum, and subsequently examined for air bubbles to avoid headspace which would allow volatilization to occur. The samples are promptly transported in iced storage in a thermally-insulated ice chest, accompanied by a Chain of Custody Record, to a California-certified laboratory.

ATTACHMENT B

**LABORATORY ANALYSIS REPORTS
AND CHAIN OF CUSTODY RECORDS**



Sequoia Analytical

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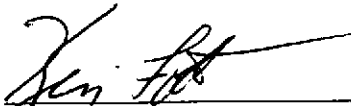
Environmental Resolutions 74 Digital Drive, Suite 6 Novato, CA 94949	Client Proj. ID: Exxon 7-3006 / 20103X Sample Descript: W-7-MW1 Matrix: LIQUID Analysis Method: 8015Mod/8020 Lab Number: 9606B89-01	Sampled: 06/19/96 Received: 06/20/96 Analyzed: 06/26/96 Reported: 07/03/96
----------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------

QC Batch Number: GC062696BTEX02A
Instrument ID: GCHP02

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Methyl t-Butyl Ether	2.5	7.1
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


Kevin Follett
Project Manager

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Environmental Resolutions 74 Digital Drive, Suite 6 Novato, CA 94949	Client Proj. ID: Exxon 7-3006 / 20103X Sample Descript: W-7-MW1 Matrix: LIQUID Analysis Method: EPA 8015 Mod Lab Number: 9606B89-01	Sampled: 06/19/96 Received: 06/20/96 Extracted: 06/24/96 Analyzed: 06/26/96 Reported: 07/03/96
Attention: Marc Briggs		


QC Batch Number: GC0624960HBPEXZ
Instrument ID: GCHP4A

Total Extractable Petroleum Hydrocarbons (TEPH)

Analyte	Detection Limit ug/L	Sample Results ug/L
TEPH as Diesel Chromatogram Pattern: Unidentified HC	50	93
		C9-C24
Surrogates	Control Limits %	% Recovery
n-Pentacosane (C25)	50 150	121

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

SEQUOIA ANALYTICAL - ELAP #1210



Kevin Follett
Project Manager





Environmental Resolutions 74 Digital Drive, Suite 6 Novato, CA 94949	Client Proj. ID: Exxon 7-3006 / 20103X Sample Descript: W-7-MW1 Matrix: LIQUID Analysis Method: EPA 8015 Mod Lab Number: 9606B89-01	Sampled: 06/19/96 Received: 06/20/96 Extracted: 06/24/96 Analyzed: 06/26/96 Reported: 07/02/96
Attention: Marc Briggs		

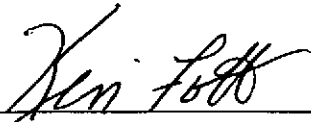
QC Batch Number: GC0624960HBPEXZ
Instrument ID: GCHP4A

Fuel Fingerprint : Stoddard Solvent

Analyte	Detection Limit ug/L	Sample Results ug/L
Extract HC as Stoddard Solvent Chromatogram Pattern:	50	N.D.
Surrogates	Control Limits %	% Recovery
n-Pentacosane (C25)	50 150	121

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

SEQUOIA ANALYTICAL - ELAP #1210



Kevin Follett
Project Manager





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FAX (916) 921-0100

Environmental Resolutions 74 Digital Drive, Suite 6 Novato, CA 94949	Client Proj. ID: Exxon 7-3006 / 20103X Sample Descript: W-12-MW9 Matrix: LIQUID Analysis Method: 8015Mod/8020 Lab Number: 9606B89-02	Sampled: 06/19/96 Received: 06/20/96 Analyzed: 06/26/96 Reported: 07/03/96
Attention: Marc Briggs		


QC Batch Number: GC062696BTEX02A
Instrument ID: GCHP02

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

Surrogates	Control Limits %	% Recovery
Trifluorotoluene	70 130	89

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

SEQUOIA ANALYTICAL - ELAP #1210



Kevin Follett
Project Manager





Environmental Resolutions 74 Digital Drive, Suite 6 Novato, CA 94949	Client Proj. ID: Exxon 7-3006 / 20103X Sample Descript: W-12-MW9 Matrix: LIQUID Analysis Method: EPA 8015 Mod Lab Number: 9606B89-02	Sampled: 06/19/96 Received: 06/20/96 Extracted: 06/24/96 Analyzed: 06/26/96 Reported: 07/03/96
Attention: Marc Briggs		

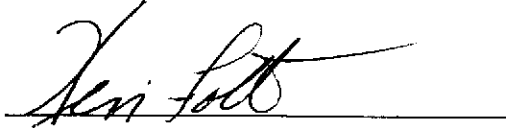
QC Batch Number: GC0624960HBPEXZ
Instrument ID: GCHP4A

Total Extractable Petroleum Hydrocarbons (TEPH)

Analyte	Detection Limit ug/L	Sample Results ug/L
TEPH as Diesel Chromatogram Pattern: Unidentified HC	50	68 C9-C24
Surrogates n-Pentacosane (C25)	Control Limits % 50 150	% Recovery 119

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

SEQUOIA ANALYTICAL - ELAP #1210



Kevin Follett
Project Manager





Environmental Resolutions 74 Digital Drive, Suite 6 Novato, CA 94949	Client Proj. ID: Exxon 7-3006 / 20103X Sample Descript: W-12-MW9 Matrix: LIQUID Analysis Method: EPA 8015 Mod Lab Number: 9606B89-02	Sampled: 06/19/96 Received: 06/20/96 Extracted: 06/24/96 Analyzed: 06/26/96 Reported: 07/02/96
----------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------

QC Batch Number: GC0624960HBPEXZ
Instrument ID: GCHP4A

Fuel Fingerprint : Stoddard Solvent

Analyte	Detection Limit ug/L	Sample Results ug/L
Extract HC as Stoddard Solvent Chromatogram Pattern:	50	N.D.
Surrogates	Control Limits %	% Recovery
n-Pentacosane (C25)	50 150	119

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

SEQUOIA ANALYTICAL - ELAP #1210

Kevin Follett
Project Manager





Environmental Resolutions 74 Digital Drive, Suite 6 Novato, CA 94949	Client Proj. ID: Exxon 7-3006 / 20103X Sample Descript: W-8-MW10 Matrix: LIQUID Analysis Method: EPA 8015 Mod Lab Number: 9606B89-03	Sampled: 06/19/96 Received: 06/20/96 Extracted: 06/24/96 Analyzed: 06/26/96 Reported: 07/03/96
Attention: Marc Briggs		

QC Batch Number: GC0624960HBPEXZ
Instrument ID: GCHP4A

Total Extractable Petroleum Hydrocarbons (TEPH)

Analyte	Detection Limit ug/L	Sample Results ug/L
TEPH as Diesel Chromatogram Pattern:	50	N.D.
Surrogates	Control Limits %	% Recovery
n-Pentacosane (C25)	50 150	123

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

SEQUOIA ANALYTICAL - ELAP #1210

Kevin Follett
Project Manager





Environmental Resolutions 74 Digital Drive, Suite 6 Novato, CA 94949 Attention: Marc Briggs	Client Proj. ID: Exxon 7-3006 / 20103X Sample Descript: W-8-MW10 Matrix: LIQUID Analysis Method: EPA 8015 Mod Lab Number: 9606B89-03	Sampled: 06/19/96 Received: 06/20/96 Extracted: 06/24/96 Analyzed: 06/26/96 Reported: 07/02/96
------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------

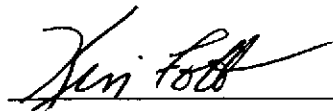
QC Batch Number: GC0624960HBPEXZ
Instrument ID: GCHP4A

Fuel Fingerprint : Stoddard Solvent

Analyte	Detection Limit ug/L	Sample Results ug/L
Extract HC as Stoddard Solvent Chromatogram Pattern:	50	N.D.
Surrogates	Control Limits %	% Recovery
n-Pentacosane (C25)	50 150	123

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

SEQUOIA ANALYTICAL - ELAP #1210



Kevin Follett
Project Manager





Sequoia Analytical

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 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

Environmental Resolutions 74 Digital Drive, Suite 6 Novato, CA 94949	Client Proj. ID: Exxon 7-3006 / 20103X Sample Descript: W-10-MW11 Matrix: LIQUID Analysis Method: 8015Mod/8020 Lab Number: 9606B89-04	Sampled: 06/19/96 Received: 06/20/96 Analyzed: 06/26/96 Reported: 07/03/96
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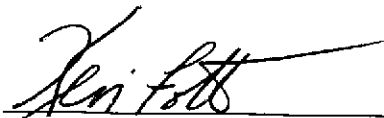
QC Batch Number: GC062696BTEX02A
Instrument ID: GCHP02

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	50	N.D.
Methyl t-Butyl Ether	2.5	33
Benzene	0.50	N.D.
Toluene	0.50	N.D.
Ethyl Benzene	0.50	N.D.
Xylenes (Total)	0.50	N.D.
Chromatogram Pattern:		N.D.

Surrogates	Control Limits %	% Recovery
Trifluorotoluene	70 130	33 Q

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

SEQUOIA ANALYTICAL - ELAP #1210


 Kevin Follett
 Project Manager





Environmental Resolutions 74 Digital Drive, Suite 6 Novato, CA 94949	Client Proj. ID: Exxon 7-3006 / 20103X Sample Descript: W-10-MW11 Matrix: LIQUID Analysis Method: EPA 8015 Mod Lab Number: 9606B89-04	Sampled: 06/19/96 Received: 06/20/96 Extracted: 06/24/96 Analyzed: 06/26/96 Reported: 07/03/96
Attention: Marc Briggs		

QC Batch Number: GC0624960HBPEXZ
Instrument ID: GCHP4A

Total Extractable Petroleum Hydrocarbons (TEPH)

Analyte	Detection Limit ug/L	Sample Results ug/L
TEPH as Diesel Chromatogram Pattern: Unidentified HC	50	92 C9-C24
Surrogates	Control Limits %	% Recovery
n-Pentacosane (C25)	50 150	130

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

SEQUOIA ANALYTICAL - ELAP #1210

Kevin Follett
Project Manager





Environmental Resolutions 74 Digital Drive, Suite 6 Novato, CA 94949	Client Proj. ID: Exxon 7-3006 / 20103X Sample Descript: W-10-MW11 Matrix: LIQUID Analysis Method: EPA 8015 Mod Lab Number: 9606B89-04	Sampled: 06/19/96 Received: 06/20/96 Extracted: 06/24/96 Analyzed: 06/26/96 Reported: 07/02/96
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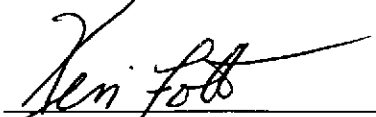
QC Batch Number: GC0624960HBPEXZ
Instrument ID: GCHP4A

Fuel Fingerprint : Stoddard Solvent

Analyte	Detection Limit ug/L	Sample Results ug/L
Extract HC as Stoddard Solvent Chromatogram Pattern:	50	N.D.
Surrogates	Control Limits %	% Recovery
n-Pentacosane (C25)	50 150	130

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

SEQUOIA ANALYTICAL - ELAP #1210



 Kevin Follett
 Project Manager





Environmental Resolutions
74 Digital Drive, Suite 6
Novato, CA 94949

Client Proj. ID: Exxon 7-3006 / 20103X
Sample Descript: W-12-MW14
Matrix: LIQUID
Analysis Method: EPA 601
Lab Number: 9606B89-05

Sampled: 06/19/96
Received: 06/20/96
Analyzed: 06/27/96
Reported: 07/03/96

Attention: Marc Briggs

QC Batch Number: GC062696060115A
Instrument ID: GCHP15

Purgeable Halocarbons (EPA 601)

Analyte	Detection Limit ug/L	Sample Results ug/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon Tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.
Surrogates	Control Limits %	% Recovery
1-Chloro-2-fluorobenzene	70 130	93

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

SEQUOIA ANALYTICAL - ELAP #1210

Kevin Follett
Project Manager





Sequoia Analytical

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(916) 921-9600

FAX (415) 364-9233
FAX (510) 988-9673
FAX (916) 921-0100

Environmental Resolutions 74 Digital Drive, Suite 6 Novato, CA 94949	Client Proj. ID: Exxon 7-3006 / 20103X Sample Descript: W-12-MW14 Matrix: LIQUID Analysis Method: 8015Mod/8020 Lab Number: 9606B89-05	Sampled: 06/19/96 Received: 06/20/96 Analyzed: 06/27/96 Reported: 07/03/96
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QC Batch Number: GC062796BTEX17A
Instrument ID: GCHP17

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	250	610
Methyl t-Butyl Ether	12	N.D.
Benzene	2.5	N.D.
Toluene	2.5	N.D.
Ethyl Benzene	2.5	N.D.
Xylenes (Total)	2.5	N.D.
Chromatogram Pattern: Unidentified HC		C7-C12

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



Kevin Follett
Project Manager





Environmental Resolutions 74 Digital Drive, Suite 6 Novato, CA 94949	Client Proj. ID: Exxon 7-3006 / 20103X Sample Descript: W-12-MW14 Matrix: LIQUID Analysis Method: EPA 8015 Mod Lab Number: 9606B89-05	Sampled: 06/19/96 Received: 06/20/96 Extracted: 06/24/96 Analyzed: 06/25/96 Reported: 07/03/96
----------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------

Attention: Marc Briggs


QC Batch Number: GC0624960HBPEXZ
Instrument ID: GCHP4A

Total Extractable Petroleum Hydrocarbons (TEPH)

Analyte	Detection Limit ug/L	Sample Results ug/L
TEPH as Diesel Chromatogram Pattern: Unidentified HC	50	2000 C9-C24
Surrogates	Control Limits %	% Recovery
n-Pentacosane (C25)	50 150	196 Q

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

SEQUOIA ANALYTICAL - ELAP #1210



Kevin Follett
Project Manager





Environmental Resolutions 74 Digital Drive, Suite 6 Novato, CA 94949	Client Proj. ID: Exxon 7-3006 / 20103X Sample Descript: W-12-MW14 Matrix: LIQUID Analysis Method: EPA 8015 Mod Lab Number: 9606B89-05	Sampled: 06/19/96 Received: 06/20/96 Extracted: 06/24/96 Analyzed: 06/25/96 Reported: 07/03/96
Attention: Marc Briggs		

QC Batch Number: GC0624960HBPEXZ
Instrument ID: GCHP4A

Fuel Fingerprint : Stoddard Solvent

Analyte	Detection Limit ug/L	Sample Results ug/L
Extract HC as Stoddard Solvent	50	670
Chromatogram Pattern: Unidentified HC		C9-C13
Surrogates	Control Limits %	% Recovery
n-Pentacosane (C25)	50 150	196 Q

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

SEQUOIA ANALYTICAL - ELAP #1210

Kevin Follett
Project Manager





Environmental Resolutions 74 Digital Drive, Suite 6 Novato, CA 94949	Client Proj. ID: Exxon 7-3006 / 20103X Sample Descript: W-9-MW7 Matrix: LIQUID Analysis Method: EPA 601 Lab Number: 9606B89-06	Sampled: 06/19/96 Received: 06/20/96 Analyzed: 06/27/96 Reported: 07/03/96
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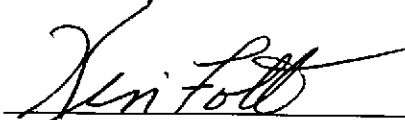
QC Batch Number: GC062696060115A
Instrument ID: GCHP15

Purgeable Halocarbons (EPA 601)

Analyte	Detection Limit ug/L	Sample Results ug/L
Bromodichloromethane	0.50	N.D.
Bromoform	0.50	N.D.
Bromomethane	1.0	N.D.
Carbon Tetrachloride	0.50	N.D.
Chlorobenzene	0.50	N.D.
Chloroethane	1.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	1.0	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dichlorobenzene	0.50	N.D.
1,3-Dichlorobenzene	0.50	N.D.
1,4-Dichlorobenzene	0.50	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
cis-1,2-Dichloroethene	0.50	N.D.
trans-1,2-Dichloroethene	0.50	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	0.50	N.D.
trans-1,3-Dichloropropene	0.50	N.D.
Methylene chloride	5.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	0.50	N.D.
Vinyl chloride	1.0	N.D.
Surrogates	Control Limits %	% Recovery
1-Chloro-2-fluorobenzene	70 130	97

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

SEQUOIA ANALYTICAL - ELAP #1210


Kevin Follett
Project Manager





Sequoia Analytical

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

Environmental Resolutions 74 Digital Drive, Suite 6 Novato, CA 94949	Client Proj. ID: Exxon 7-3006 / 20103X Sample Descript: W-9-MW7 Matrix: LIQUID Analysis Method: 8015Mod/8020 Lab Number: 9606B89-06	Sampled: 06/19/96 Received: 06/20/96 Analyzed: 06/26/96 Reported: 07/03/96
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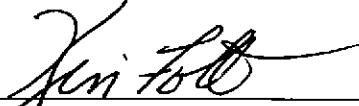
QC Batch Number: GC062696BTEX02A
Instrument ID: GCHP02

Analyte	Detection Limit ug/L	Sample Results ug/L
TPPH as Gas	500	2000
Methyl t-Butyl Ether	25	N.D.
Benzene	5.0	96
Toluene	5.0	N.D.
Ethyl Benzene	5.0	N.D.
Xylenes (Total)	5.0	5.6
Chromatogram Pattern: Weathered Gas		C6-C12

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


 Kevin Follett
 Project Manager





Environmental Resolutions
74 Digital Drive, Suite 6
Novato, CA 94949

Client Proj. ID: Exxon 7-3006 / 20103X
Sample Descript: W-9-MW7
Matrix: LIQUID
Analysis Method: EPA 8015 Mod
Lab Number: 9606B89-06

Sampled: 06/19/96
Received: 06/20/96
Extracted: 06/24/96
Analyzed: 06/26/96
Reported: 07/03/96

Attention: Marc Briggs

QC Batch Number: GC0624960HBPEXZ
Instrument ID: GCHP4A

Total Extractable Petroleum Hydrocarbons (TEPH)

Analyte	Detection Limit ug/L	Sample Results ug/L
TEPH as Diesel	50	1400
Chromatogram Pattern: Unidentified HC		C9-C24
Surrogates	Control Limits %	% Recovery
n-Pentacosane (C25)	50 150	143

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

SEQUOIA ANALYTICAL - ELAP #1210

Kevin Follett
Project Manager





Environmental Resolutions	Client Proj. ID: Exxon 7-3006 / 20103X	Sampled: 06/19/96
74 Digital Drive, Suite 6	Sample Descript: W-9-MW7	Received: 06/20/96
Novato, CA 94949	Matrix: LIQUID	Extracted: 06/24/96
Attention: Marc Briggs	Analysis Method: EPA 8015 Mod	Analyzed: 06/26/96
	Lab Number: 9606B89-06	Reported: 07/03/96

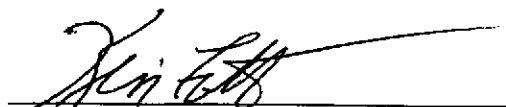
QC Batch Number: GC0624960HBPEXZ
Instrument ID: GCHP4A

Fuel Fingerprint : Stoddard Solvent

Analyte	Detection Limit ug/L	Sample Results ug/L
Extract HC as Stoddard Solvent	50	1000
Chromatogram Pattern: Unidentified HC		C9-C13
Surrogates	Control Limits %	% Recovery
n-Pentacosane (C25)	50 150	143

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

SEQUOIA ANALYTICAL - ELAP #1210



Kevin Follett
Project Manager





Environmental Resolutions 74 Digital Drive, Ste. 6 Novato, CA 94949 Attention: Marc Briggs	Client Project ID: Exxon 7-3006 / 20103X Matrix: Liquid Work Order #: 9606B89 01-06	Reported: Jul 3, 1996
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QUALITY CONTROL DATA REPORT

Analyte: Diesel
QC Batch#: GC0624960HBPEXZ
Analy. Method: EPA 8015M
Prep. Method: EPA 3520

Analyst: B. Ali
MS/MSD #: 9606B8905
Sample Conc.: 2000
Prepared Date: 6/24/96
Analyzed Date: 6/25/96
Instrument I.D.#: GCHP4A
Conc. Spiked: 1000 µg/L

Result: 2900
MS % Recovery: 90

Dup. Result: 2800
MSD % Recov.: 80

RPD: 3.5
RPD Limit: 0-50

LCS #: BLK062496

Prepared Date: 6/24/96
Analyzed Date: 6/25/96
Instrument I.D.#: GCHP4A
Conc. Spiked: 1000 µg/L

LCS Result: 850
LCS % Recov.: 85

MS/MSD	50-150
LCS	60-140
Control Limits	

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.

SEQUOIA ANALYTICAL

Kevin Follett
Project Manager

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

9606B89.EEE <1>





Sequoia Analytical

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

Environmental Resolutions Client Project ID: Exxon 7-3006 / 20103X
 74 Digital Drive, Ste. 6 Matrix: Liquid
 Novato, CA 94949
 Attention: Marc Briggs Work Order #: 9606B89 01-04, 06 Reported: Jul 3, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC062696BTEX02A	GC062696BTEX02A	GC062696BTEX02A	GC062696BTEX02A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030

Analyst:	J. Woo	J. Woo	J. Woo	J. Woo
MS/MSD #:	960691503	960691503	960691503	960691503
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	6/26/96	6/26/96	6/26/96	6/26/96
Analyzed Date:	6/26/96	6/26/96	6/26/96	6/26/96
Instrument I.D.#:	GCHP2	GCHP2	GCHP2	GCHP2
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
Result:	9.9	9.9	10	30
MS % Recovery:	99	99	100	100
Dup. Result:	9.5	9.5	9.8	29
MSD % Recov.:	95	95	98	97
RPD:	4.1	4.1	2.0	3.4
RPD Limit:	0-25	0-25	0-25	0-25

LCS #:	BLK062696	BLK062696	BLK062696	BLK062696
Prepared Date:	6/26/96	6/26/96	6/26/96	6/26/96
Analyzed Date:	6/26/96	6/26/96	6/26/96	6/26/96
Instrument I.D.#:	GCHP2	GCHP2	GCHP2	GCHP2
Conc. Spiked:	10 µg/L	10 µg/L	10 µg/L	30 µg/L
LCS Result:	9.4	9.3	9.4	28
LCS % Recov.:	94	93	94	93

MS/MSD	60-140	60-140	60-140	60-140
LCS	70-130	70-130	70-130	70-130
Control Limits				

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.

SEQUOIA ANALYTICAL

Kevin Follett
 Kevin Follett
 Project Manager

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

9606B89.EEE <2>





Sequoia Analytical

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Environmental Resolutions Client Project ID: Exxon 7-3006 / 20103X
 74 Digital Drive, Ste. 6 Matrix: Liquid
 Novato, CA 94949
 Attention: Marc Briggs Work Order #: 9606B89 05 Reported: Jul 3, 1996

QUALITY CONTROL DATA REPORT

Analyte:	Benzene	Toluene	Ethyl Benzene	Xylenes
QC Batch#:	GC062796BTEX17A	GC062796BTEX17A	GC062796BTEX17A	GC062796BTEX17A
Analy. Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020
Prep. Method:	EPA 5030	EPA 5030	EPA 5030	EPA 5030

Analyst:	J. Woo	J. Woo	J. Woo	J. Woo
MS/MSD #:	960680703	960680703	960680703	960680703
Sample Conc.:	N.D.	N.D.	N.D.	N.D.
Prepared Date:	6/27/96	6/27/96	6/27/96	6/27/96
Analyzed Date:	6/27/96	6/27/96	6/27/96	6/27/96
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:	9.7	9.6	9.5	28
MSD % Recov.:	97	96	95	93
RPD:	3.0	4.1	5.1	6.9
RPD Limit:	0-25	0-25	0-25	0-25

LCS #:	BLK062796	BLK062796	BLK062796	BLK062796
Prepared Date:	6/27/96	6/27/96	6/27/96	6/27/96
Analyzed Date:	6/27/96	6/27/96	6/27/96	6/27/96
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	9.6	9.7	29
LCS % Recov.:	95	96	97	97

MS/MSD	60-140	60-140	60-140	60-140
LCS	70-130	70-130	70-130	70-130
Control Limits				

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.

SEQUOIA ANALYTICAL

Kevin Follett
 Kevin Follett
 Project Manager

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

9606B89.EEE <3>





Environmental Resolutions
74 Digital Drive, Ste. 6
Novato, CA 94949
Attention: Marc Briggs

Client Project ID: Exxon 7-3006 / 20103X
Matrix: Liquid

Work Order #: 90606B89 01-06

Reported: Jul 3, 1996

QUALITY CONTROL DATA REPORT

Analyte:	1,1-Dichloro-ethene	Trichloro-ethene	Chloro-benzene
QC Batch#:	GC062696060115A	GC062696060115A	GC062696060115A
Analy. Method:	EPA 601	EPA 601	EPA 601
Prep. Method:	EPA 5030	EPA 5030	EPA 5030

Analyst:	A. Li	A. Li	A. Li
MS/MSD #:	9606C9702	9606C9702	9606C9702
Sample Conc.:	ND.	ND.	ND.
Prepared Date:	6/26/96	6/26/96	6/26/96
Analyzed Date:	6/26/96	6/26/96	6/26/96
Instrument I.D.#:	GCHP15	GCHP15	GCHP15
Conc. Spiked:	25 µg/L	25 µg/L	25 µg/L
Result:	23	22	23
MS % Recovery:	92	88	92
Dup. Result:	25	24	25
MSD % Recov.:	100	96	100
RPD:	8.3	8.7	8.3
RPD Limit:	0-25	0-25	0-25

LCS #:	BLK062696	BLK062696	BLK062696
Prepared Date:	6/26/96	6/26/96	6/26/96
Analyzed Date:	6/26/96	6/26/96	6/26/96
Instrument I.D.#:	GCHP15	GCHP15	GCHP15
Conc. Spiked:	25 µg/L	25 µg/L	25 µg/L
LCS Result:	24	23	24
LCS % Recov.:	96	92	96

MS/MSD	60-140	60-140	60-140
LCS	65-135	70-130	70-130
Control Limits			

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

Kevin Follett
Kevin Follett
Project Manager





680 Chesapeake Dr.
Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

EXXON COMPANY, U.S.A.

P.O. Box 2180, Houston, TX 77002-7426

CHAIN OF CUSTODY

Consultant's Name: Environmental Resolutions Inc

Address: 74 Digital Dr Suite 6 Novato Ca 94999 Site Location: 720 High Street

Project #: 7-3006 Consultant Project #: 201013X Consultant Work Release #: 19432503

Project Contact: Marc Briggs Phone #: 415 382 9105 Laboratory Work Release #:

EXXON Contact: Marla Guenster Phone #: 510 246 8776 EXXON RAS #: 7-3006

Sampled by (print): Scott Graham Sampler's Signature: Scott Graham Oakland, Ca

Shipment Method: Air Bill #:

TAT: 24 hr 48 hr 72 hr 96 hr Standard (10 day)

ANALYSIS REQUIRED 9006 B89

Sample Description	Collection Date	Collection Time	Matrix Soil/Water/Air	Prsv	# of Cont.	Sequoia's Sample #	TPH/Gas BTEX/ 8015/ 8020	TPH/ Diesel EPA 8015	3310/8 Standard Solvents	MTBE	purgable Halo- carbons 601	Temperature: _____
1 W-7-MW1	6/19/96	15:45	Water	WCL ICE	3		X			X	X	Inbound Seal: Yes No Outbound Seal: Yes No
2 W-12-MW9		16:50					X			X	X	
3 W-8-MW10		16:05					X			X	X	
4 W-10-MW11		16:20					X			X	X	
5 W-12-MW14		16:35					X			X	X	
6 W-9-MW7		17:05					X			X	X	
12 W-7-MW1		15:50			2			X	X			
2 W-12-MW9		16:55						X	X			
3 W-8-MW10		16:10						X	X			

RELINQUISHED BY / AFFILIATION	Date	Time	ACCEPTED / AFFILIATION	Date	Time	Additional Comments
<u>Scott Graham</u>	<u>6/20/96</u>	<u>9:50</u>	<u>AWright / SEQ</u>	<u>6/20/96</u>	<u>9:50</u>	
<u>AWright / SEQ</u>	<u>6/20/96</u>	<u>12:30</u>	<u>Paul Smith</u>	<u>6/20/96</u>	<u>11:25</u>	

Pink - Client
1236
Yellow - Sequoia
White - Sequoia



Sequoia Analytical
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Redwood City, CA 94063
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CHAIN OF CUSTODY

Consultant's Name: Environmental Resolutions Inc

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Project #: 7-3006 Consultant Project #: 201013X Consultant Work Release #: 19432503

Project Contact: Marc Briggs Phone #: 415 382 9105 Laboratory Work Release #:

EXXON Contact: Marla Guenster Phone #: 510 246 8776 EXXON RAS #: 7-3006

Sampled by (print): Scott Graham Sampler's Signature: Scott Graham Oakland, Ca

Shipment Method: Air Bill #:

TAT: 24 hr 48 hr 72 hr 96 hr Standard (10 day)

ANALYSIS REQUIRED 9600 B89

Sample Description	Collection Date	Collection Time	Matrix Soil/Water/Air	Prsv	# of Cont.	Sequoia's Sample #	TPH/Gas BTEX/ 8015/ 8020	TPH/ Diesel EPA 8015	TRPH S.M. 5520	Stoddard Solvent 3510/ 8015	Purgeable Halo-carbons 601	Temperature: _____	
												Inbound Seal: Yes No	Outbound Seal: Yes No
<u>W-10-MW11</u>	<u>6/19/96</u>	<u>16:25</u>	<u>Water</u>	<u>JCE</u>	<u>2</u>			<u>X</u>		<u>X</u>			
<u>W-12-MW14</u>	<u>/</u>	<u>16:40</u>	<u>/</u>	<u>/</u>	<u>3</u>	<u>61</u>		<u>X</u>		<u>X</u>	<u>X</u>		
<u>W-9-MW7</u>	<u>/</u>	<u>16:10</u>	<u>/</u>	<u>/</u>	<u>3</u>	<u>5</u>		<u>X</u>		<u>X</u>	<u>X</u>		

RELINQUISHED BY / AFFILIATION	Date	Time	ACCEPTED / AFFILIATION	Date	Time	Additional Comments
<u>Scott Graham</u>	<u>6/20/96</u>	<u>9:50</u>	<u>Shelby/SEA</u>	<u>6/20/96</u>	<u>9:50</u>	
<u>Shelby/SEA</u>	<u>6/20/96</u>	<u>12:30</u>	<u>Fuller</u>	<u>6/20/96</u>	<u>11:30</u>	

Pink - Client

12 36

Yellow - Sequoia

White - Sequoia

ATTACHMENT C

**ERI SOP-25 "HYDROCARBONS REMOVED
FROM A VADOSE WELL"**



POUNDS OF HYDROCARBON IN AN AIR STREAM

INPUT DATA:

- 1) Air flow rate acfm (usually by Pitot tube)
- 2) Air pressure at the flow measuring device (in inches of H₂O) (use {-} for vacuum)
- 3) Air temperature at the flow measuring device.
- 4) Hydrocarbon content of air (usually in mg/M³) for ppmv you need molecular weight.
- 5) Length of time (usually hours) over which flow rate occurred)

From periodic measurements, a calculation of total pounds of hydrocarbons removed from a well or from a system are calculated. The input data listed above are measured at a point in time. To calculate quantities removed, some assumptions must be made about what was happening between measurements. The following assumptions will be used for the sake of consistency:

ASSUMPTIONS:

- 1) Air flow for the period equals the average of the initial and final reading for the period.
- 2) Pressure and temperature for the entire period will be the final reading.
- 3) Hydrocarbon concentration for the period equals the average of the initial and final reading.
- 4) The hours of operation can be taken from an hour meter, an electric meter or will be assumed to be equal to the time between measurements.
- 5) If the unit is found down - try to determine how many hours it did operate and use the data taken for the previous period to make the calculations. Restart the unit and then take data to start the next period.

SAMPLE DATA AND CALCULATIONS

Date	Time	Temp deg F	Press in H ₂ O	HC conc mg/M ³	Air flow acfm	Calc. lb. rem.
1/6/95	11:00	70	-46	2000	120	
1/7/95	13:00	55	-50	1350	90	
1/8/95	10:00	80	-13	750	100	7.4

Calculate the pounds of hydrocarbon removed from the system during the basis period from 13:00 (1:00 pm) on the 7th to 10 am on the 8th. Pressure and temperature of the measurements (at the flow meter) must be corrected to the P and T used to report the HC concentration (which are P = 1 atm and T = 70 deg F). 1 atm = 14.7psia, 760 mm Hg, or 407 in H₂O. $T_{abs} = 460 + T \text{ deg F}$

Hours of operation = 21, T = 80, P = -13, HC = (1350+750)/2 = 1050 mg/M³. Flow = 95

$$21 \times 60 \times 95 \times \frac{(460+70)}{(460+80)} \times \frac{(407-13)}{407} \times \frac{28.3}{1000} \times \frac{1050}{1000} \times \frac{1}{454} = 7.4 \text{ lb}$$

$$\frac{\text{hr}}{\text{basis}} \times \frac{\text{min}}{\text{hr}} \times \frac{\text{cu ft}}{\text{min}} \times T_{\text{Corr}} \times P_{\text{Corr}} \times \frac{\text{M}^3}{\text{cu ft}} \times \frac{\text{g}}{\text{M}^3} \times \frac{\text{lb}}{\text{g}} = \frac{\text{lb}}{\text{basis}}$$

$$21 \times 60 \times 95 \times 0.98 \times 0.97 \times 0.0283 \times 1.050 \times 1/454 = 7.4 \text{ lb.}$$

cumulative lbs. (the running total) = the sum of all the previous periods.

Note: If results are given in ppm, an assumption about the molecular weight of the hydrocarbon must be made to get mg/M³. ppmv x molecular wt. /22.4 = mg/M³. (Use 102 for gasoline)