



R0479

#1585

November 8, 2001

NOV 15 2001

QUARTERLY GROUNDWATER MONITORING REPORT
OCTOBER 2001 GROUNDWATER SAMPLING

at

Lim Family Property
250 8th Street
Oakland, California

Submitted by:
AQUA SCIENCE ENGINEERS, INC.
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1.0 INTRODUCTION

This report outlines the methods and findings of Aqua Science Engineers, Inc. (ASE)'s quarterly groundwater monitoring at the Lim family property located at 250 8th Street in Oakland, California (*Figures 1 and 2*).

2.0 GROUNDWATER FLOW DIRECTION AND GRADIENT

On October 25, 2001, ASE associate geologist Erik Paddleford measured the depth to water in each site well using an electric water level sounder. The surface of the groundwater was also checked for the presence of free-floating hydrocarbons or sheen. No free-floating hydrocarbons or sheen was present on the water surface in monitoring wells MW-1, MW-2, and MW-4. ~~Monitoring well MW-3 contained 0.38-feet of free-floating hydrocarbons.~~ Groundwater elevation data is presented in Table One.

A groundwater elevation (potentiometric surface) contour map is shown as Figure 2. The groundwater flow direction at the site is generally to the southwest with a gradient of 0.013 feet/foot during this quarterly sampling period. This groundwater flow direction and gradient are consistent with previous findings.

3.0 MONITORING WELL SAMPLING

On October 25, 2001, ASE associate geologist Erik Paddleford collected groundwater samples from monitoring wells MW-1, MW-2, and MW-4 for analysis. Monitoring well MW-3 was not sampled due to the presence of free-floating hydrocarbons. Prior to sampling, the remaining wells were purged of four well casing volumes of groundwater using dedicated polyethylene bailers. The pH, temperature, and conductivity of the purge water were monitored during evacuation, and samples were not collected until these parameters stabilized. Samples were collected from each well using dedicated polyethylene bailers. The groundwater samples analyzed for volatile compounds were decanted from the bailers into 40-ml volatile organic analysis (VOA) vials, preserved with hydrochloric acid, sealed without headspace and labeled. The samples to be analyzed for extractable range hydrocarbons were contained in 1-liter amber glass bottles. All samples were stored on ice for transport to Kiff Analytical, LLC, (KIFF) of Davis, California under appropriate chain of custody documentation. Well sampling purge water was contained in a sealed and labeled 55-gallon steel drum and left on-site for temporary storage until

off-site disposal can be arranged. See Appendix A for a copy of the well sampling field logs.

4.0 ANALYTICAL RESULTS FOR GROUNDWATER

All groundwater samples were analyzed by KIFF for total petroleum hydrocarbons as diesel (TPH-D) by modified EPA Method 3510/8015M, total petroleum hydrocarbons as gasoline (TPH-G), benzene, toluene, ethyl benzene, total xylenes (collectively known as BTEX), lead scavengers, and methyl tertiary butyl ether (MTBE) by EPA Method 8260B. The groundwater samples collected from monitoring wells MW-2 and MW-4 were also analyzed for oil and grease (O&G) by EPA Method 1664. The analytical results are tabulated in Tables Two and Three, and copies of the certified analytical report and chain of custody form are included in Appendix B.

5.0 CONCLUSIONS

Monitoring well MW-3 contained 0.38-feet of free-floating hydrocarbons this quarter. Overall, the hydrocarbon concentrations are consistent with previous analytical results and remain elevated in downgradient monitoring wells MW-2, MW-3, and MW-4. The BTEX concentrations in groundwater samples collected from monitoring wells MW-2 and MW-4 exceeded California Department of Health Services (DHS) maximum contaminant levels (MCLs) for drinking water. In addition, the MTBE and 1,2-dichloroethane (1,2-DCA) concentrations detected in groundwater samples collected from monitoring well MW-4 exceeded DHS MCLs for drinking water.

6.0 RECOMMENDATIONS

ASE is currently performing the work outlined in ASE's February 2001 workplan. ASE has completed the on-site drilling, but cannot install the monitoring wells in 8th Street until January 2002 due to the holiday restriction placed by the City of Oakland. ASE will continue this work in January.

7.0 REPORT LIMITATIONS

The results of this investigation represent conditions at the time of the groundwater sampling, at the specific locations where the samples were collected, and for the specific parameters analyzed by the laboratory. It does not fully characterize the site for contamination resulting from unknown sources, or for parameters not analyzed by the laboratory. All of the laboratory work cited in this report was prepared under the direction of an independent CAL-EPA certified laboratory. The independent laboratory is solely responsible for the contents and conclusions of the chemical analysis data.

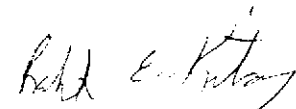
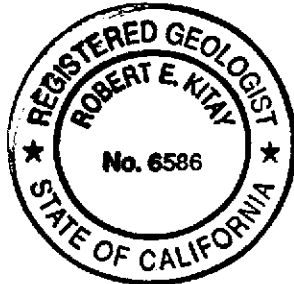
Aqua Science Engineers appreciates the opportunity to assist The Lim Family with their environmental needs. Should you have any questions or comments, please feel free to call us at (925) 820-9391.

Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.



Erik H. Paddleford
Associate Geologist



Robert E. Kitay, R.G., R.E.A.
Senior Geologist

Attachments: Figures 1 and 2
Appendices A and B

TABLE ONE
 Groundwater Elevation Data
 Lim Family Property
 250 8th Street
 Oakland, CA

Well I.D.	Date of Measurement	Top of Casing Elevation (msl)	Depth to Water (feet)	Product Thickness (feet)	Groundwater Elevation (msl)
MW-1	01/30/95	25.51	16.21		9.30
	04/12/95		15.71		9.80
	07/14/95		16.71		8.80
	10/17/95		17.72		7.79
	01/12/96		18.03		7.48
	07/25/96		16.82		8.69
	01/06/97		15.60		9.91
	07/08/97		17.31		8.20
	01/26/98		15.21		10.30
	07/23/98		15.38		10.13
	01/05/99		16.82		8.69
	07/13/99		15.89		9.62
	01/12/00		17.44		8.07
	04/24/00		16.37		9.14
	07/20/00		16.30		9.21
	10/24/00		17.25		8.26
	01/18/01		17.29		8.22
	04/05/01		15.88		9.63
07/17/01	16.54		8.97		
10/25/01	16.89		8.62		
MW-2	01/30/95	23.99	15.02		8.97
	04/12/95		14.75		9.24
	07/14/95		16.02		7.97
	10/17/95		16.94		7.05
	01/12/96		17.05		6.94
	07/25/96		16.02		7.97
	01/06/97		14.34		9.65
	07/08/97		16.52		7.47
	01/26/98		14.10		9.89
	07/23/98		14.70		9.29
	01/05/99		16.01		7.98
	07/13/99		15.40		8.59
	01/12/00		16.76		7.23
	04/24/00		15.67		8.32
	07/20/00		15.70		8.29
	10/24/00		16.56		7.43
	01/18/01		16.47		7.52
	04/05/01		15.88		8.11
07/17/01	15.35		8.64		
10/25/01	15.63		8.36		

TABLE ONE
Groundwater Elevation Data
Lim Family Property
250 Bth Street
Oakland, CA

Well I.D.	Date of Measurement	Top of Casing Elevation (msl)	Depth to Water (feet)	Product Thickness (feet)	Groundwater Elevation (msl)
MW-3	01/12/00	24.25	16.68	0.01	7.57
	04/24/00		15.58	0.15	8.55*
	07/20/00		16.01	0.41	7.64*
	10/24/00		16.95	0.21	7.13*
	01/18/01		16.63	0.21	7.79*
	04/05/01		15.16	0.23	9.27
	07/17/01		15.92	0.39	8.64
	10/25/01		16.26	0.38	8.29
MW-4	01/12/00	23.71	17.24		6.47
	04/24/00		16.18		7.53
	07/20/00		16.18		7.53
	10/24/00		17.03		6.68
	01/18/01		16.87		6.84
	04/05/01		15.28		8.43
	07/17/01		15.92		7.79
	10/25/01		16.23		7.48
IW-1	07/13/99	24.05	14.75		9.30
IW-2	07/13/99	24.21	15.10		9.11
IW-3	07/13/99	23.93	15.00		8.93
IW-4	07/13/99	23.83	Unknown		Unknown
IW-5	07/13/99	24.00	15.50	1.00	8.50*
	07/23/99		15.52	1.05	9.32*
	08/03/99		15.58	0.64	8.93*
	08/17/99		15.62	0.86	9.07*
	08/27/99		15.92	0.77	8.70*
	09/10/99		15.82	0.56	8.63*
	09/24/99		15.57	0.26	8.64*
	10/08/99		15.56	0.23	8.62*
	11/02/99		15.59	0.22	8.59*
	11/19/99		15.64	0.07	8.42*
	12/16/99		16.12	0.64	8.39*
	01/12/00		16.54	0.28	7.68*

Notes:

* = Adjusted for the presence of free-floating oil by the equation:
Top of Casing Elevation - Depth to Water + (0.8 x Floating Hydrocarbon Thickness) =
Groundwater Elevation (Adjusted).

TABLE TWO
 Summary of Chemical Analysis of Groundwater Samples
 Petroleum Hydrocarbon Concentrations
 All results are in parts per billion

Well/ Date Sampled	TPH Gasoline	TPH Diesel	Benzene	Toluene	Ethyl- benzene	Total Xylenes	MTBE
<u>MW-1</u>							
01/30/95	740	200	3	5	1	4	--
04/12/95	400	500	<0.5	<0.5	3	<2	--
07/14/95	520	400	1	<0.5	2	3	--
10/17/95	400	200	0.5	1	3	<2	--
01/12/96	120	890	<0.5	<0.5	<0.5	<1.0	<2.0
07/08/96	320	300	0.52	2.7	1.2	2.3	<5.0
01/06/97	110	75	<0.5	0.68	<0.5	<0.5	<5.0
07/08/97	380	290	<0.5	1.5	1.4	1.9	<5.0
01/26/98	<50	<50	<0.5	<0.5	<0.5	<0.5	<5.0
07/23/98	190	<50	0.54	2.8	2	1.8	<5.0
01/05/99	200	<50	1.8	1.6	3.3	<0.5	<5.0
07/13/99	340	<50	<0.5	<0.5	2.6	<0.5	<5.0
01/12/00	300	1,000	22	36	5.5	24	<5.0
04/24/00	360	280*	<0.5	<0.5	<0.5	2.1	<5.0
07/20/00	290	150*	1.8	<0.5	<0.5	<0.5	<5.0
10/24/00	170**	280*	<0.5	<0.5	<0.5	<0.5	<5.0
01/18/01	170**	150*	<0.5	<0.5	<0.5	2.1	<5.0
04/05/01	350**	190*	<0.5	<0.5	<0.5	<0.5	<5.0
07/17/01	310	570	<0.5	<0.5	<0.5	<0.5	<5.0
10/25/01	250	260	<0.5	<0.5	<0.5	<0.5	<5.0

TABLE TWO
 Summary of Chemical Analysis of Groundwater Samples
 Petroleum Hydrocarbon Concentrations
 All results are in parts per billion

Well/ Date Sampled	TPH Gasoline	TPH Diesel	Benzene	Toluene	Ethyl- benzene	Total Xylenes	MTBE
<u>MW-2</u>							
01/30/95	88,000	800	19,000	18,000	2,400	10,000	--
04/12/95	110,000	990	21,000	28,000	2,800	14,000	--
07/14/95	120,000	5,000	20,000	25,000	3,200	15,000	--
10/17/95	190,000	4,000	15,000	26,000	4,900	23,000	--
01/12/96	32,000	2,600	10,000	8,000	1,100	4,800	< 2
07/08/96	110,000	2,500	20,000	18,000	2,500	12,000	< 500
01/06/97	230,000	37,000	11,000	19,000	4,300	20,000	< 1,200
07/08/97	91,000	35,000	16,000	20,000	2,700	13,000	< 1,000
01/26/98	50,000	11,000	12,000	12,000	1,600	6,700	< 250
07/23/98	50,000	8,100#	11,000	8,300	1,800	7,000	1,100
01/05/99	50,000	7,600#	12,000	12,000	2,300	9,600	1,300
07/13/99	73,000	8,500	11,000	13,000	2,200	9,800	< 500
01/12/00	63,000	11,000	10,000	12,000	1,800	7,800	< 500
04/24/00	76,000	23,000*	7,100	14,000	2,000	9,400	< 500
07/20/00	68,000	5,300#	11,000	14,000	2,300	11,000	< 1,000
10/24/00	48,000	6,400*	11,000	9,400	1,500	7,300	< 500
01/18/01	37,000	4,600*	6,900	5,600	1,200	5,300	< 500
04/05/01	59,000	4,600*	7,100	9,800	1,600	7,600	< 500
07/17/01	90,000	< 10,000	9,200	14,000	2,700	11,000	< 50
10/25/01	79,000	< 3,800	9,200	14,000	2,400	11,000	< 50

TABLE TWO
 Summary of Chemical Analysis of Groundwater Samples
 Petroleum Hydrocarbon Concentrations
 All results are in parts per billion

Well/ Date Sampled	TPH Gasoline	TPH Diesel	Benzene	Toluene	Ethyl- benzene	Total Xylenes	MTBE
<u>MW-3</u>							
01/12/00	140,000	13,000*	22,000	19,000	2,400	11,000	< 500
04/24/00	240,000	700,000*	33,000/	52,000/	5,700/	28,000/	< 5,000
			35,000	87,000	18,000	84,000	
07/20/00	NOT SAMPLED DUE TO FREE-FLOATING HYDROCARBONS						
10/24/00	NOT SAMPLED DUE TO FREE-FLOATING HYDROCARBONS						
01/18/01	NOT SAMPLED DUE TO FREE-FLOATING HYDROCARBONS						
04/05/01	NOT SAMPLED DUE TO FREE-FLOATING HYDROCARBONS						
07/17/01	NOT SAMPLED DUE TO FREE-FLOATING HYDROCARBONS						
10/25/01	NOT SAMPLED DUE TO FREE-FLOATING HYDROCARBONS						
<u>MW-4</u>							
01/12/00	99,000	7,900*	16,000	20,000	2,100	12,000	< 2,500
04/24/00	54,000	44,000*	3,400/	13,000/	1,800/	8,800/	< 1,300
			4,500	20,000	2,800	14,000	
07/20/00	8,000	3,500	9,200/	20,000	2,500	12,000/	< 1,000
			11,000	22,000	3,400	13,000	
10/24/00	98,000	8,000*	21,000	29,000	2,700	15,000	< 1,000
01/18/01	91,000	12,000	17,000/	21,000/	2,500/	13,000	< 1,000
			15,000	21,000	2,800	11,000	< 5,000
04/05/01	88,000	7,500*	6,900/	18,000/	2,500/	12,000/	< 1,000
			3,200	9,000	1,300	6,400	< 500
07/17/01	95,000	< 3,000	8,000	16,000	2,900	11,000	49
10/25/01	89,000	< 2,200	9,300	18,000	2,400	12,000	66
DHS MCL	NE	NE	1	150	700	1,750	13
EPA	5030/	3550/	8020/	8020/	8020/	8020/	8020
METHOD	8015M	8015M	8260	8260	8260	8260	

Notes:

* = Hydrocarbons reported are in the early diesel range, and do not match the laboratory standard.

** = Hydrocarbons reported do not match the laboratory gasoline standard.

= Estimated concentration reported due to overlapping fuel patterns.

/ = Results separated by a slash represent results from two different laboratory methods (8020/8260).

Non-detectable concentrations noted by the less than sign (<) followed by the detection limit.

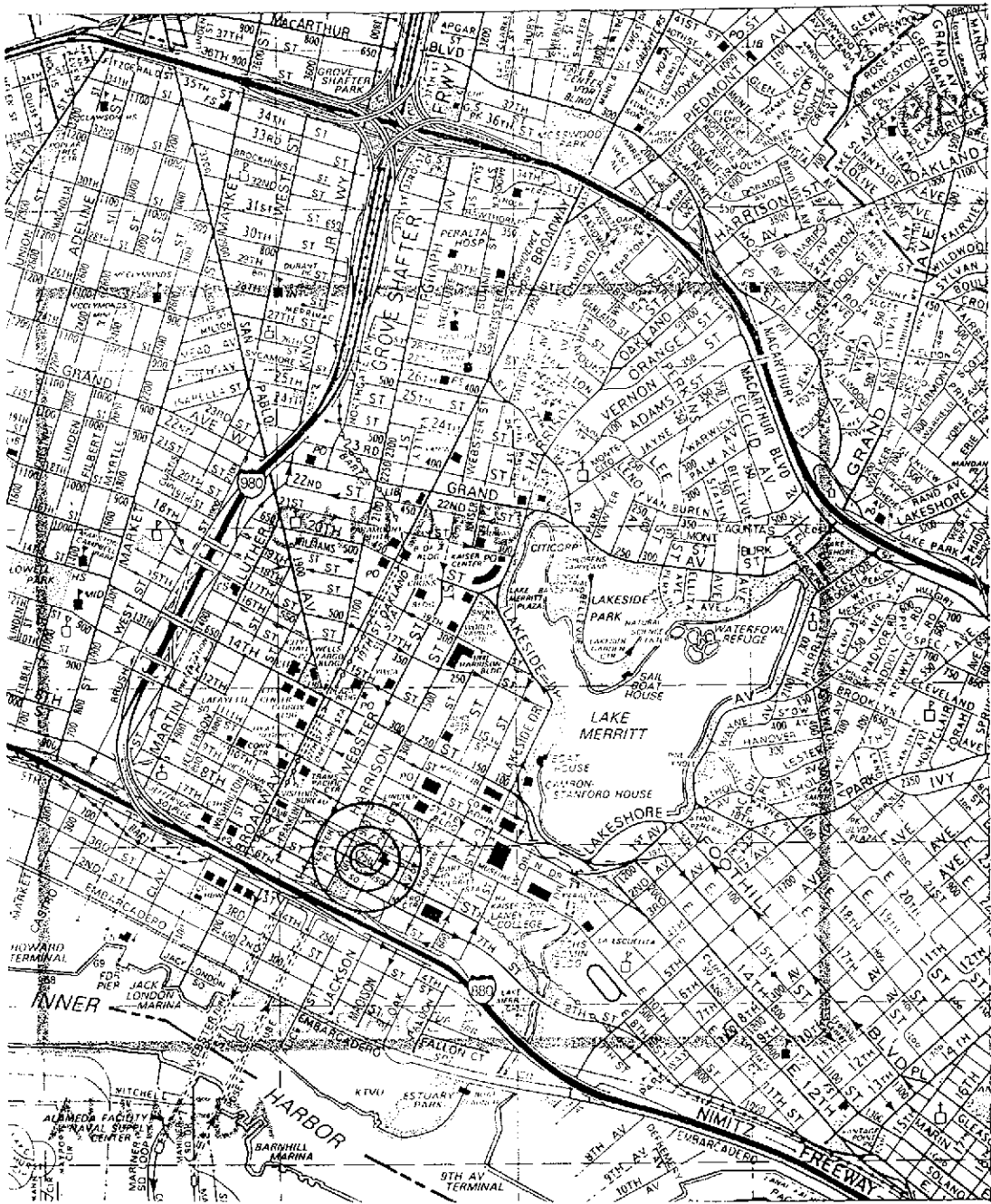
Most recent data in bold.

TABLE THREE
Groundwater Analytical Results
Oil & Grease and Volatile Organic Compounds
 All results are in parts per billion

Date Sampled & Compound Analyzed	MW-1	MW-2	MW-3	MW-4
<u>7/8/1997</u>				
Hydrocarbon Oil and Grease	---	< 1,000	-	-
Tetrachloroethane (PCE)	0.9	< 0.5	-	-
Other VOCs	< 0.5 - < 3	< 0.5 - < 3	-	-
<u>1/26/1998</u>				
Hydrocarbon Oil and Grease	---	< 1,000	-	-
Trichloroethers	0.7	< 5.0	-	-
Tetrachloroethene	10	< 5.0	-	-
1,2-Dichloroethane	< 0.5	11	-	-
Other VOCs	< 0.5 - < 50	< 0.5 - < 50	-	-
<u>7/23/1998</u>				
Hydrocarbon Oil and Grease	---	< 1,000	-	-
Tetrachloroethene	4	4.6	-	-
1,2-Dichloroethane	< 2	9.9	-	-
Other VOCs	< 2 - < 10	< 0.5 - < 5.0	-	-
<u>1/5/1999</u>				
Hydrocarbon Oil and Grease	---	< 1,000	-	-
Tetrachloroethene	5.1	< 50	-	-
Trichloroethers	0.52	< 50	-	-
1,1,2,2-Tetrachloroethane	0.58	< 50	-	-
Chloroform	8.2	< 50	-	-
Other VOCs	< 0.5 - < 5	< 50 - < 500	-	-
<u>7/13/1999</u>				
Hydrocarbon Oil and Grease	---	< 1,000	-	-
Tetrachloroethene	1.5	0.68	-	-
Chloroform	4.6	< 50	-	-
1,2-Dichloroethane	< 0.50	7.7	-	-
Other VOCs	< 0.5 - < 5	< 0.5 - < 500	-	-
<u>1/12/2000</u>				
Hydrocarbon Oil and Grease	---	< 1,000	< 1,000	< 1,000
Tetrachloroethene	0.8	< 1.0	< 100	< 50
Chloroform	3.2	< 1.0	< 100	< 50
1,2-Dichloroethane	< 0.50	8.8	120	140
Acetone	---	---	25,000	6,400
Naphthalene	---	---	550	540
Isopropylbenzene	---	---	120	89
Other VOCs	< 0.5 - < 5.0	< 1.0 - < 4.0	< 100 - < 10,000	< 50 - < 5,000

TABLE THREE
Groundwater Analytical Results
Oil & Grease and Volatile Organic Compounds
 All results are in parts per billion

Date Sampled & Compound Analyzed	MW-1	MW-2	MW-3	MW-4
<u>4/24/2000</u>				
Hydrocarbon Oil and Grease	---	<1,000	4,100	<1,000
1,2-Dichloroethane	< 0.5	5.9	<1,000	< 250
Naphthalene	---	---	3,800	590
Isopropylbenzene	---	---	1,200	< 250
Other VOCs	< 0.5 - < 5.0	< 5.0 - < 20	< 1,000 - < 100,000	< 250 - < 25,000
<u>7/20/2000</u>				
Hydrocarbon Oil and Grease	---	<1,000		<1,000
Tetrachloroethene	0.59	< 5.0	FREE	< 200
Chloroform	2.1	< 5.0	PRODUCT	< 200
1,2-Dichloroethane	< 0.5	6.7	---	< 200
Acetone	---	---	NOT	< 20,000
Naphthalene	---	---	SAMPLED	730
Other VOCs	< 0.5 - < 20	< 5.0 - < 20		< 250 - < 20,000
<u>10/24/2000</u>				
Hydrocarbon Oil and Grease	---	<1,000	FREE	<1,000
Tetrachloroethene	< 0.5	< 5.0	PRODUCT	< 250
Chloroform	1.0	< 5.0	NOT	< 250
Other VOCs	< 0.5 - < 20	< 5.0 - < 20	SAMPLED	< 250 - < 25,000
<u>1/18/2001</u>				
Hydrocarbon Oil and Grease	---	2,100	FREE	1,300
Tetrachloroethene	1.3	< 5.0	PRODUCT	< 250
Chloroform	6.4	< 5.0	NOT	< 250
Other VOCs	< 0.5 - < 20	< 5.0 - < 20	SAMPLED	< 250 - < 25,000
<u>4/5/2001</u>				
Hydrocarbon Oil and Grease	---	< 1.0	FREE	1,100.0
Tetrachloroethene	< 0.5	1.1	PRODUCT	< 50
1,2 dichloroethane	< 0.5	4.6	---	< 50
Trichloroethene	< 0.5	0.58	NOT	< 50
Naphthalene	---	---	---	320
Other VOCs	< 0.5 - < 2.0	< 5.0 - < 20	SAMPLED	< 50 - < 5,000
<u>7/17/2001</u>				
Hydrocarbon Oil and Grease	---	< 500	FREE	< 500
Tetrachloroethene	---	---	PRODUCT	---
1,2 dichloroethane	< 0.5	< 50	---	69.0
Trichloroethene	---	---	NOT	---
Naphthalene	---	---	---	---
Other VOCs	---	---	SAMPLED	---
<u>10/25/2001</u>				
Hydrocarbon Oil and Grease	---	< 5.0	FREE	< 5.0
1,2 dichloroethane	---	< 50	PRODUCT	72
1,2 dibromoethane	---	< 50	NOT	< 50
Other VOCs	---	---	SAMPLED	---



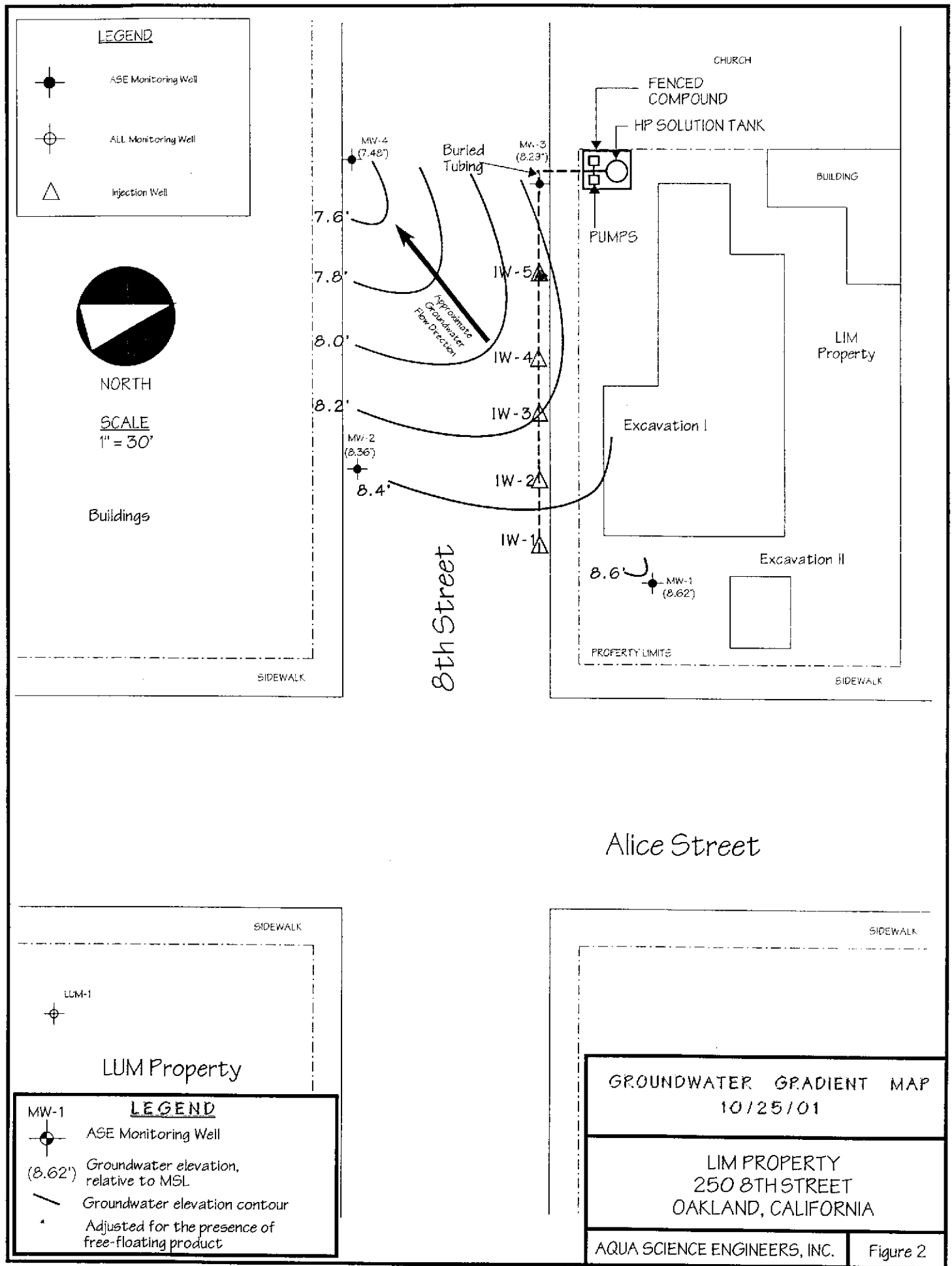
SITE LOCATION MAP

Lim Property
250 8th Street
Oakland, California

Aqua Science Engineers

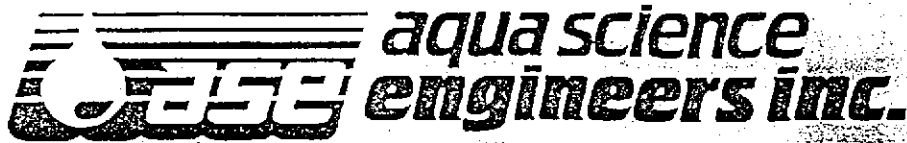
Figure 1

BASE: The Thomas Guide, Alameda and Contra Costa
Counties Street Guide & Directory, 1990



APPENDIX A

Well Sampling Field Log



WELL SAMPLING FIELD LOG

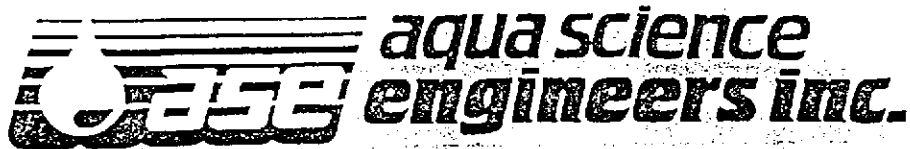
Project Name and Address: Lim Property
 Job #: 2808 Date of sampling: 10/25/01
 Well Name: MW-1 Sampled by: EP
 Total depth of well (feet): 26.78 Well diameter (inches): 2
 Depth to water before sampling (feet): 16.89
 Thickness of floating product if any: —
 Depth of well casing in water (feet): 9.89
 Number of gallons per well casing volume (gallons): 1.58
 Number of well casing volumes to be removed: 4
 Req'd volume of groundwater to be purged before sampling (gallons): 632
 Equipment used to purge the well: boiler
 Time Evacuation Began: 1240 Time Evacuation Finished: 1300
 Approximate volume of groundwater purged: 6
 Did the well go dry?: no After how many gallons: —
 Time samples were collected: 1305
 Depth to water at time of sampling: —
 Percent recovery at time of sampling: —
 Samples collected with: boiler
 Sample color: gray/clear Odor: slight HC
 Description of sediment in sample: silt

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
1	68.9	7.36	804
2	69.0	7.37	721
3	69.1	7.38	684
4	69.0	7.39	638

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
<u>MW-1</u>	<u>5</u>	<u>40 ml VOA</u>	<u>x</u>	<u>x</u>	



WELL SAMPLING FIELD LOG

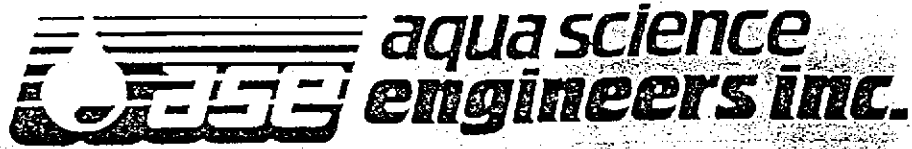
Project Name and Address: Lim Property
 Job #: 2808 Date of sampling: 10/25/01
 Well Name: MW-2 Sampled by: EP
 Total depth of well (feet): 26.78 Well diameter (inches): 2
 Depth to water before sampling (feet): 15.63
 Thickness of floating product if any: -
 Depth of well casing in water (feet): 11.15
 Number of gallons per well casing volume (gallons): 1.78
 Number of well casing volumes to be removed: 4
 Req'd volume of groundwater to be purged before sampling (gallons): 7
 Equipment used to purge the well: boiler
 Time Evacuation Began: 1130 Time Evacuation Finished: 1150
 Approximate volume of groundwater purged: 7
 Did the well go dry?: no After how many gallons: -
 Time samples were collected: 1200
 Depth to water at time of sampling: -
 Percent recovery at time of sampling: -
 Samples collected with: boiler
 Sample color: gray Odor: moderate HC odor
 Description of sediment in sample: silt

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
1	64.9	7.38	915
2	65.0	7.31	908
3	65.2	7.18	891
4	65.5	7.02	878

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
MW-2	5	40 ml VOA	x	x	
	1	1 liter amber		x	



WELL SAMPLING FIELD LOG

Project Name and Address: Lim property
Job #: 2808 Date of sampling: 10/25/01
Well Name: M4-3 Sampled by: EP
Total depth of well (feet): _____ Well diameter (inches): 2
Depth to water before sampling (feet): 1588 1626
Thickness of floating product if any: 0.38
Depth of well casing in water (feet): _____
Number of gallons per well casing volume (gallons): _____
Number of well casing volumes to be removed: _____
Req'd volume of groundwater to be purged before sampling (gallons): _____
Equipment used to purge the well: _____
Time Evacuation Began: _____ Time Evacuation Finished: _____
Approximate volume of groundwater purged: _____
Did the well go dry?: _____ After how many gallons: _____
Time samples were collected: _____
Depth to water at time of sampling: _____
Percent recovery at time of sampling: _____
Samples collected with: _____
Sample color: _____ Odor: _____
Description of sediment in sample: _____

CHEMICAL DATA

<u>Volume Purged</u>	<u>Temp</u>	<u>pH</u>	<u>Conductivity</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

SAMPLES COLLECTED

<u>Sample</u>	<u># of containers</u>	<u>Volume & type container</u>	<u>Pres</u>	<u>Iced?</u>	<u>Analysis</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____



WELL SAMPLING FIELD LOG

Project Name and Address: Linn Property
 Job #: 2808 Date of sampling: 10/25/01
 Well Name: MW-4 Sampled by: EP
 Total depth of well (feet): 26.60 Well diameter (inches): 2
 Depth to water before sampling (feet): 11.23
 Thickness of floating product if any: -
 Depth of well casing in water (feet): 10.37
 Number of gallons per well casing volume (gallons): 1.66
 Number of well casing volumes to be removed: 4
 Req'd volume of groundwater to be purged before sampling (gallons): 6.6
 Equipment used to purge the well: bailer
 Time Evacuation Began: 1205 Time Evacuation Finished: 1220
 Approximate volume of groundwater purged: 6
 Did the well go dry?: no After how many gallons: -
 Time samples were collected: 1230
 Depth to water at time of sampling: -
 Percent recovery at time of sampling: -
 Samples collected with: bailer
 Sample color: gray/clear Odor: moderate H₂S odor
 Description of sediment in sample: silt-f sand

CHEMICAL DATA

Volume Purged	Temp	pH	Conductivity
<u>1</u>	<u>67.5</u>	<u>7.40</u>	<u>793</u>
<u>2</u>	<u>67.6</u>	<u>7.28</u>	<u>790</u>
<u>3</u>	<u>67.7</u>	<u>7.21</u>	<u>790</u>
<u>4</u>	<u>67.7</u>	<u>7.14</u>	<u>780</u>

SAMPLES COLLECTED

Sample	# of containers	Volume & type container	Pres	Iced?	Analysis
<u>MW-4</u>	<u>5</u>	<u>40 ml VVA</u>	<u>x</u>	<u>x</u>	
	<u>1</u>	<u>1 liter Amber</u>		<u>x</u>	

APPENDIX B

Certified Analytical Report
and
Chain of Custody Documentation



Report Number : 23080

Date : 11/5/2001

Eric Paddleford
Aqua Science Engineers, Inc.
208 West El Pintado Rd.
Danville, CA 94526

Subject : 3 Water Samples
Project Name : Lim Property
Project Number : 2808

Dear Mr. Paddleford,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,



Joel Kiff



Report Number : 23080

Date : 11/5/2001

Subject : 3 Water Samples
Project Name : Lim Property
Project Number : 2808

Case Narrative

The Method Reporting Limit for TPH as Diesel has been increased due to interference from Gasoline-Range Hydrocarbons for the following sample:

MW-2

MW-4

Approved By:  _____
Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 916-297-4800



Report Number : 23080

Date : 11/5/2001

Project Name : **Lim Property**

Project Number : **2808**

Sample : **MW-1**

Matrix : **Water**

Lab Number : **23080-01**

Sample Date : **10/25/2001**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	11/1/2001
Toluene	< 0.50	0.50	ug/L	EPA 8260B	11/1/2001
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	11/1/2001
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	11/1/2001
Methyl-t-butyl ether (MTBE)	< 5.0	5.0	ug/L	EPA 8260B	11/1/2001
TPH as Gasoline	250	50	ug/L	EPA 8260B	11/1/2001
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	11/1/2001
4-Bromofluorobenzene (Surr)	109		% Recovery	EPA 8260B	11/1/2001
TPH as Diesel	260	50	ug/L	M EPA 8015	11/2/2001

Approved By:  Joel Kiff



Report Number : 23080

Date : 11/5/2001

Project Name : **Lim Property**

Project Number : **2808**

Sample : MW-2

Matrix : Water

Lab Number : 23080-02

Sample Date :10/25/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	9200	50	ug/L	EPA 8260B	11/2/2001
Toluene	14000	50	ug/L	EPA 8260B	11/2/2001
Ethylbenzene	2400	50	ug/L	EPA 8260B	11/2/2001
Total Xylenes	11000	50	ug/L	EPA 8260B	11/2/2001
Methyl-t-butyl ether (MTBE)	< 50	50	ug/L	EPA 8260B	11/2/2001
TPH as Gasoline	79000	5000	ug/L	EPA 8260B	11/2/2001
1,2-Dichloroethane	< 50	50	ug/L	EPA 8260B	11/2/2001
1,2-Dibromoethane	< 50	50	ug/L	EPA 8260B	11/2/2001
Toluene - d8 (Surr)	97.6		% Recovery	EPA 8260B	11/2/2001
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	11/2/2001
Dibromofluoromethane (Surr)	101		% Recovery	EPA 8260B	11/2/2001
1,2-Dichloroethane-d4 (Surr)	98.9		% Recovery	EPA 8260B	11/2/2001
TPH as Diesel	< 3800	3800	ug/L	M EPA 8015	11/2/2001

Approved By:  Joel Kiff



Report Number : 23080

Date : 11/5/2001

Project Name : Lim Property

Project Number : 2808

Sample : MW-4

Matrix : Water

Lab Number : 23080-03

Sample Date :10/25/2001

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	9300	50	ug/L	EPA 8260B	11/2/2001
Toluene	18000	50	ug/L	EPA 8260B	11/2/2001
Ethylbenzene	2400	50	ug/L	EPA 8260B	11/2/2001
Total Xylenes	12000	50	ug/L	EPA 8260B	11/2/2001
Methyl-t-butyl ether (MTBE)	66	50	ug/L	EPA 8260B	11/2/2001
TPH as Gasoline	89000	5000	ug/L	EPA 8260B	11/2/2001
1,2-Dichloroethane	72	50	ug/L	EPA 8260B	11/2/2001
1,2-Dibromoethane	< 50	50	ug/L	EPA 8260B	11/2/2001
Toluene - d8 (Surr)	98.8		% Recovery	EPA 8260B	11/2/2001
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	11/2/2001
Dibromofluoromethane (Surr)	101		% Recovery	EPA 8260B	11/2/2001
1,2-Dichloroethane-d4 (Surr)	98.8		% Recovery	EPA 8260B	11/2/2001
TPH as Diesel	< 2200	2200	ug/L	M EPA 8015	11/2/2001

Approved By:  Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 23080

Date : 11/5/2001

Project Name : **Lim Property**

Project Number : **2808**

23080 Quality Control Data - Method Blank

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
TPH as Diesel	< 50	50	ug/L	M EPA 8015	10/31/2001

Approved By: 
Joel Kiff

Report Number : 23080

Date : 11/5/2001

QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **Lim Property**

Project Number : **2808**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Spike Recovery Data														
TPH as Diesel	Blank	<50	1000	1000	808	962	ug/L	M EPA 8015	10/31/20080.8	96.2	17.4	70-130	25	

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Approved By: Joel Kiff



Report Number : 23080

Date : 11/5/2001

Project Name : **Lim Property**

Project Number : **2808**

23080 Quality Control Data - Method Blank

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	11/2/2001
Toluene	< 0.50	0.50	ug/L	EPA 8260B	11/2/2001
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	11/2/2001
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	11/2/2001
Methyl-t-butyl ether (MTBE)	< 0.50	0.50	ug/L	EPA 8260B	11/2/2001
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	11/2/2001
1,2-Dichloroethane	< 0.50	0.50	ug/L	EPA 8260B	11/2/2001
1,2-Dibromoethane	< 0.50	0.50	ug/L	EPA 8260B	11/2/2001
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	11/2/2001
4-Bromofluorobenzene (Surr)	91.8		% Recovery	EPA 8260B	11/2/2001
Dibromofluoromethane (Surr)	106		% Recovery	EPA 8260B	11/2/2001
1,2-Dichloroethane-d4 (Surr)	99.9		% Recovery	EPA 8260B	11/2/2001

Approved By:  Joel Kiff

Report Number : 23080

Date : 11/5/2001

QC Report : Matrix Spike/ Matrix Spike Duplicate

Project Name : **Lim Property**

Project Number : **2808**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Spike Recovery Data														
Benzene	23038-01	7.0	19.6	18.8	26.2	25.0	ug/L	EPA 8260B	11/2/2001	198.1	95.5	2.70	70-130	25
Toluene	23038-01	0.90	19.6	18.8	20.8	19.6	ug/L	EPA 8260B	11/2/2001	1101	99.4	1.99	70-130	25
Tert-Butanol	23038-01	6.6	98.0	94.0	106	103	ug/L	EPA 8260B	11/2/2001	1101	103	1.47	70-130	25
Methyl-t-Butyl Ether	23038-01	34	19.6	18.8	56.2	54.2	ug/L	EPA 8260B	11/2/2001	1112	106	5.21	70-130	25

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Approved By:  Joel Kiff

Report Number : 23080

Date : 11/5/2001

QC Report : Laboratory Control Sample (LCS)

Project Name : **Lim Property**

Project Number : **2808**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	40.0	ug/L	EPA 8260B	11/2/2001	92.8	70-130
Toluene	40.0	ug/L	EPA 8260B	11/2/2001	93.5	70-130
Tert-Butanol	200	ug/L	EPA 8260B	11/2/2001	101	70-130
Methyl-t-Butyl Ether	40.0	ug/L	EPA 8260B	11/2/2001	95.4	70-130

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Approved By:  _____
Joel Kiff

Analysis Report: N-Hexane Extractable Material by EPA Method 1664

Client: Joel Kiff
720 Olive Drive,
Suite D
Davis, CA 95616

Project No.: 2808
Contact: Joel Kiff
Phone: (530)297-4800

Project: Lim Property

Lab Contact: James Liang
Lab ID No.: T2933
Job No.: 842933
COC Log No.: 23080
Batch No.: E02394
Instrument ID: BA002
Analyst ID: ANHENG
Matrix: WA

Date Sampled: 10/25/2001
Date Received: 11/01/2001
Date Extracted: 11/05/2001
Date Analyzed: 11/06/2001
Date Reported: 11/07/2001

ANALYTICAL RESULTS

Lab / Client ID Analyte	CAS No.	Results (mg/L)	Rep. Limit (mg/L)	Dilution (factor)
1A / MW-2 N-Hexane Extractable Material	N/A	ND	5.0	1.0
2A / MW-4 N-Hexane Extractable Material	N/A	ND	5.0	1.0

ND = Not detected at or above indicated Reporting Limit

Aqua Science Engineers, Inc.
 208 W. El Pintado Road
 Danville, CA 94526
 (925) 820-9391
 FAX (925) 837-4853

Chain of Custody 23080

PAGE 1 OF 1

SAMPLER (SIGNATURE)

E. Paddelford

PROJECT NAME Llm Property

JOB NO. 2808

ADDRESS 250 8th St. Oakland, CA

ANALYSIS REQUEST

SPECIAL INSTRUCTIONS:

5 DAY TAT

SAMPLE ID.	DATE	TIME	MATRIX	NO. OF SAMPLES	TPH-GAS / MTBE & BTEX (EPA 503.0/8015-8020)	TPH-DIESEL (EPA 3510/8015)	TPH-DIESEL & MOTOR OIL (EPA 3510/8015)	PURGEABLE HALOCARBONS (EPA 601/8010)	VOLATILE ORGANICS (EPA 624/8240/8260)	SEMI-VOLATILE ORGANICS (EPA 625/8270)	OIL & GREASE (EPA 5520)	LUFT METALS (5) (EPA 6010+7000)	CAM 17 METALS (EPA 6010+7000)	PCBs & PESTICIDES (EPA 608/8080)	ORGANOPHOSPHORUS PESTICIDES (EPA 8140 EPA 608/8080)	FUEL OXYGENATES (EPA 8260)	Pb (TOTAL or DISSOLVED) (EPA 6010)	TPH-G/BTEX/5 OXY'S (EPA 8260)	TPH-G/BTEX/7 OXY'S / LEAD SCAVENGERS/ 1,2-DCP (EPA 8260)	Lead Scavengers		
					MW-1	10/25/01	1305	water	5	X	X											
MW-2	10/25/01	1200	water	6	X	X					X										X	02
MW-4	10/25/01	1230	water	6	X	X					X										X	03

RELINQUISHED BY:
E. Paddelford
 (signature) 10:11 (time)

RECEIVED BY:
 (signature) (time)

RELINQUISHED BY:
 (signature) (time)

RECEIVED BY LABORATORY:
Michael B...
 (signature) 10:10 (time)

COMMENTS:
 1,2-DCP = 1,2-dichloropropane

Erik H. Paddelford
 (printed name) 10/29/01 (date)

(printed name) (date)

(printed name) (date)

Michael B... #2901
 (printed name) (date)

TURN AROUND TIME
 STANDARD 24Hr 48Hr 72Hr

Company- Aqua Science Engineers, Inc.

Company-

Company-

Company- KIFF

OTHER: