

January 27, 1997

QUARTERLY GROUNDWATER MONITORING REPORT JANUARY 6, 1997 GROUNDWATER SAMPLING

at
Lim Family Property
250 8th Street
Oakland, California

Submitted by:
AQUA SCIENCE ENGINEERS, INC.
2411 Old Crow Canyon Road, #4
San Ramon, CA 94583
(510) 820-93 1

1.0 INTRODUCTION

This report outlines the methods and findings of Aqua Science Engineer's, Inc. (ASE) semi-annual groundwater monitoring at the property located at 250 8th Street in Oakland, California (Figures 1 and 2).

2.0 SITE HISTORY

A gasoline service station previously occupied the site. In May 1992, ASE removed ten underground fuel storage tanks from the site. The tanks consisted of one (1) 10,000-gallon gasoline tank, one (1) 5,000-gallon diesel tank, three (3) 2,000-gallon gasoline tanks, one (1) 2,000-gallon diesel tank, three (3) 500-gallon gasoline tanks and one (1) 250-gallon waste oil tank. Up to 10,000 parts per million (ppm) total petroleum hydrocarbons as gasoline (TPH-G) and 5,900 ppm total petroleum hydrocarbons as diesel (TPH-D) were detected in soil samples collected during the tank removal.

Between December 1992 and March 1993, All Environmental of San Ramon, California overexcavated 1,762 cubic yards of soil from the site and off-hauled the soil to the BFI Landfill in Livermore, California. Analytical results show that all on-site soil with hydrocarbon concentrations greater than 10 ppm was removed from the site with the exception of soil along the 8th Street shoring. Up to 1,800 ppm TPH-G and 120 ppm TPH-D were detected in soil samples collected along the shoring indicating that contamination likely extends below 8th Street. This contamination left in place may still be a source for groundwater contamination.

In January 1995, ASE installed monitoring wells MW-1 and MW-2 at the site. High hydrocarbon concentrations were detected in monitoring well MW-2, downgradient of the site. Moderate hydrocarbon concentrations were detected in on-site monitoring well MW-1.

Since April 1995, the site has been on a quarterly groundwater monitoring program. Analytical results for these sampling periods are presented in Tables Two and Three.

3.0 GROUNDWATER FLOW DIRECTION AND GRADIENT

On January 6, 1997, ASE environmental specialist Scott Ferriman 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. A sheen was present on the surface of the

groundwater in well MW-2. No free-floating hydrocarbons or sheen was present on the surface of water in monitoring well MW-1. Depth to groundwater measurements for the wells on the LUM property were measurements are utilized along with the data from the Lim property measurements to determine the groundwater flow direction and gradient beneath the site. This data is presented below in Table One.

TABLE ONE Summary of Groundwater Well Survey Data

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
141 44 - 1	04-12-95	20101	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
MW-2	01-30-95	23.99	15.02		8.97
IVI VV - Z	04-12-95	23.77	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	5 heen	9.65
LUM-1	07-14-95	23.42	Unknown		Unknown
20111	10-17-95		18.21	1.53	6.43*
	01-12-96		18.15	1.35	6.35*
	07-25-96		18.08	2.36	7.23*
	01-06-97		Unknown		Unknown
LUM-2	07-14-95	23.98	17.21		6.77
BOM 2	10-17-95		17.67		6.31
	01-12-96		17.89	0.01	6.10*
	07-25-96		16.94		7.04
	01-06-97		14.35		9.63

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

Groundwater elevation contours are presented on Figure 2. On January 6, 1997, groundwater flowed to the southwest beneath the site at a gradient of 0.003-feet/foot, which is consistent with previous findings.

4.0 MONITORING WELL SAMPLING

On January 6, 1997, ASE sampled monitoring wells MW-1 and MW-2 at the Prior to sampling, four well casing volumes of water were removed from each well. The pH, temperature and conductivity were monitored during the purging, and samples were not collected until these parameters stabilized. After the water level in each well recovered to at least 80% of the water level measured prior to purging water from the well, groundwater samples were collected from the wells with dedicated The groundwater samples from each well were polyethylene bailers. decanted from the bailer into 40-ml volatile organic analysis (VOA) vials All of the samples were properly and1-liter amber glass bottles. preserved, labeled, placed in protective foam sleeves, and stored on ice for transport to Chromalab of Pleasanton, California (ELAP #1094) under chain of custody. There was a slight hydrocarbon odor present in groundwater from monitoring well MW-1 and a strong hydrocarbon odor was present in groundwater from monitoring well MW-2.

Well sampling purge water was contained in a DOT 17H drum and stored on-site for handling by the client at a later date. See Appendix A for a copy of the well sampling field logs.

5.0 ANALYTICAL RESULTS FOR GROUNDWATER

The groundwater samples were analyzed for TPH-G by EPA Method 5030/8015M, TPH-D by EPA Method 3510/8015M, and benzene, toluene, ethylbenzene, and total xylenes (BTEX) and MTBE by EPA Method 8020. The groundwater sampled from monitoring well MW-2 were analyzed for oil and grease (O&G) by Standard Method 5520BF. The analytical results are tabulated below in Tables Two and Three, and the certified analytical report and chain of custody record are included in Appendix B.

- 3 -

TABLE TWO
Summary of Chemical Analysis of GROUNDWATER Samples
TPH-G, TPH-D, BTEX and MTBE
All results are in parts per billion

Well/ Date Sampled	TPH Gasoline	TPH Diesel	Benzene	Toluene	Ethyl Benzene	Total Xylenes	MTBE
							TATE OF THE
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
07-08-96	320	300	0.52	2.7	1.2	2.3	<5
01-06-97	110	75	< 0.5	0.68	< 0.5	< 0.5	<5
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	2.5
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
EPA METHOD	5030/ 8015M	3550/ 8015M	8020	8020	8020	8020	8020

TABLE THREE Summary of Chemical Analysis of GROUNDWATER Samples Lead, Oil & Grease and Volatile Organic Compounds All results are in parts per billion

Compound 1-30-95	<u>MW-1</u>	<u>MW-2</u>
Dissolved Lead Total Oil and Grease	< 0.04 < 500	< 0.04 19,000
Hydrocarbon Oil and Grease Chloroform	< 500 0.5	17,000 < 30
Tetrachloroethene (PCE) Other VOCs	8 < 0.5-2	< 30 < 30-100
4-12-95		
Dissolved Lead Hydrocarbon Oil and Grease	< 0.04 < 500	< 0.04 22,000
Tetrachloroethene (PCE) 1,2-Dichloroethane	6 < 0.5	0.9 43
Other VOCs	< 0.5-2	< 30-100

Lim Quarterly Report - January 1997 Sampling

-4-

TABLE THREE (Continued) Summary of Chemical Analysis of GROUNDWATER Samples Lead, Oil & Grease and Volatile Organic Compounds All results are in parts per billion

Compound	MW-1	MW-2
7-14-95 Total Oil and Grease Hydrocarbon Oil and Grease 1,2-Dichloroethane Tetrachloroethene (PCE) Other VOCs	< 500 < 500 < 0.5 4 < 0.5-2	25,000 23,000 35 <5 < 5-20
10-17-95 Total Oil and Grease Hydrocarbon Oil and Grease Tetrachloroethene (PCE) Trichloroethene (TCE)	< 1,000 < 1,000 5 < 0.5	15,000 13,000 < 0.5 5
01-12-96 Hydrocarbon Oil and Grease	< 5,000	< 5,000
07-08-96 Hydrocarbon Oil and Grease Chloroform Tetrachloroethane (PCE) Other VOC's	0.8 6.4 < 0.5-3	< 1,000 < 0.5 < 0.5 < 0.5-3
Hydrocarbon Oil and Grease		4,100

6.0 CONCLUSIONS AND RECOMMENDATION

Very high hydrocarbon concentrations were detected in groundwater samples collected from monitoring well MW-2, downgradient of the site. The benzene, ethylbenzene and total xylenes concentrations in these samples exceeded the California Department of Toxic Substances (DTSC) maximum contaminant levels (MCLs) for drinking water. In addition, the toluene concentration in these samples exceeded the DTSC recommended action level for drinking water. Only low TPH-G, TPH-D and toluene concentrations were detected in groundwater samples collected from monitoring well MW-1. Low hydrocarbon oil and grease concentrations were detected in groundwater samples collected from monitoring well MW-2. No MTBE was detected in either of these groundwater samples.

Within the next thirty days ASE will submit a corrective action plan to the Alameda County Health Care Services Agency. The next semi-annual groundwater sampling is scheduled for early July 1997.

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 CA-DHS 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 (510) 820-9391.

Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.

Scott T. Ferriman

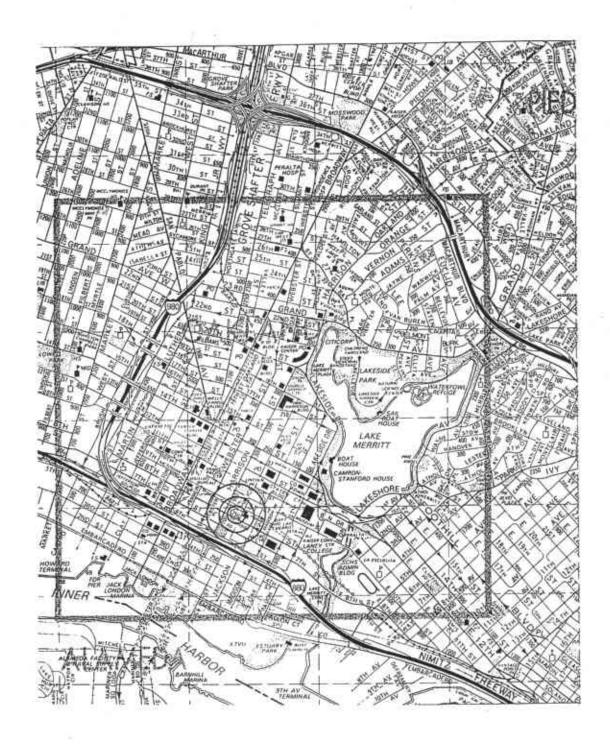
Environmental Specialist

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Attachments: Figures 1 and 2

Appendices A and B

-6-

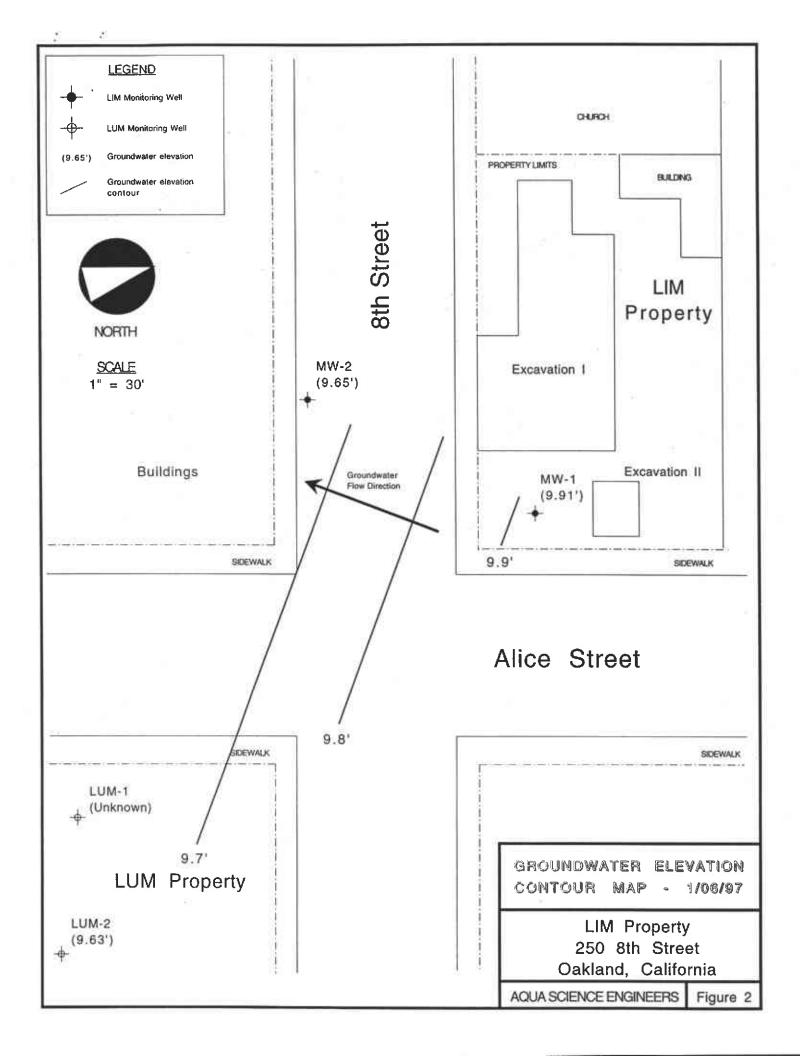


SITE LOCATION MAP

Lim Property 250 8th Street Oakland, California

Aqua Science Engineers

Figure 1



APPENDIX A

Well Sampling Field Log

	1 a 1 att at a second
Project Name and Add	ress: Lim Apperty, 250 8th Street Oakland, CA
Job #:	Date of sampling: 1-6-97 Sampled by: S
Well Name: MW-1	Sampled by:
Total depth of well (fee	et): 27.96 Well diameter (inches): 2'
Depth to water before	sampling (feet): 5.60
Thickness of floating p	product if any:
Depth of well casing in	n water (feet): 1236
Number of gallons per	well casing volume (gallons): 2,1
Number of well casing	volumes to be removed: 4
Req'd volume of groun	dwater to be purged before sampling (gallons): 3.4
Equipment used to pur	ge the well: Dedicated Poly Railer
Time Evacuation Began	n: 10:50 Time Evacuation Finished: 11:15
Approximate volume of	of groundwater purged:
	After how many gallons:
	ollected:
Depth to water at time	e of sampling: 15.71
	ne of sampling: 99 %
Samples collected with	1: Dedicated Boly Build
Sample color:	or Odor: Sight
Description of sedimer	it in sample: Deal
-	
CHEMICAL DATA	
Volume Purged	Temp pH Conductivity
	68.6 9.93 371
2	67.7 8.79 384
3	6714 4.53 400
ч	67.3 5.49 415
	(A)
SAMPLES COLLECTE	ED
Sample # of containers	Volume & type container Pres Iced? Analysis
MW-1 3	40 ml vote the Us TRHG/BTEXIMIBE
	1 e Ander V V TPHD
	1 e Ander V V TPHD
	1 e Ander V V TPHD



WELL SAMPLING FIELD LOG

Project Name and Address: Lim Property 250 8th Street Oakkal, (A
Job #: 2808 Date of sampling: 1-6-94
Well Name: Sampled by: 1:6 % SF
Total depth of well (feet): 23.82 Well diameter (inches): 2
Depth to water before sampling (feet):
Thickness of floating product if any:
Depth of well casing in water (feet): 11.97
Number of gallons per well casing volume (gallons): 2
Number of well casing volumes to be removed:
Rea'd volume of groundwater to be purged before sampling (gallons):
Req'd volume of groundwater to be purged before sampling (gallons): 8 Equipment used to purge the well:
Time Evacuation Began: 15:30 Time Evacuation Finished: 15:52
Approximate volume of groundwater purged:
Did the well go dry?: No After how many gallons:
Time samples were collected: 15:55
Depth to water at time of sampling: 14.37
Percent recovery at time of sampling: 100%
Samples collected with: Dedicard Poly Parler
Sample color: Cloudy Odor: Strong
Description of sediment in sample: Black S.H
<i>h</i>
SAMPLES COLLECTED
Sample # of containers Volume & type container Pres Iced? Analysis
MW-2 3 YOMI VOAS HEY YES TPHG/BIEX/MIRE
1 le amen 1 le TPHO
V 1 12 Amber V Ot 6 BF

APPENDIX B

Analytical Report and Chain of Custody Forms For Groundwater Samples

Environmental Services (SDB)

January 27, 1997

Submission #: 9701060

AQUA SCIENCE ENGINEERS INC

Atten: Scott Ferriman

Project: LIM, 250 8TH STREET

Project#: 2808

Received: January 7, 1997

re: 1 sample for Oil and Grease analysis.

Method: 5520 B&F

Matrix: WATER

Extracted: January 13, 1997

Analyzed: January 13, 1997 Run#: 4841 Sampled: January 6, 1997

BLANK BLANK DILUTION REPORTING RESULT SPIKE FACTOR LIMIT OIL & GREASE (mg/L)(mq/L)(%) (mq/L)113175 MW-2 4.11.0

tions Supervisor

Operations Manager

Environmental Services (SDB)

January 27, 1997

Submission #: 9701060

AQUA SCIENCE ENGINEERS INC

Atten: Scott Ferriman

Project: LIM, 250 8TH STREET

Project#: 2808

Received: January 7, 1997

re: 2 samples for TPH - Diesel analysis.

Method: EPA 8015M

Matrix: WATER

Extracted: January 13, 1997

Sampled: January 6, 1997

Run#: 4843

Analyzed: January 14, 1997

REPORTING BLANK BLANK DILUTION

RESULT SPIKE FACTOR DIESEL LIMIT (ug/L) (uq/L) <u> Spl#</u> (ug/L) CLIENT SPL ID N.D. 66.0 50 113174 MW-1 75 Note: Hydrocarbon reported does not match the pattern of our Diesel standard.

Note: Hydrocarbon reported does not match the pattern of our bleser standard. 113175 MW-2 37000 1000 N.D. 66.0 20

Note: Estimated concentration due to overlapping fuel patterns.

Bruce Havlik

Chemist

Alex Tam

Semivolatiles Supervisor

Environmental Services (SDB)

January 27, 1997

Submission #: 9701060

AQUA SCIENCE ENGINEERS INC

Atten: Scott Ferriman

Project: LIM, 250 8TH STREET

Project#:

2808

Received: January 7, 1997

re: One sample for Gasoline, BTEX & MTBE analysis.

Method: EPA 8015M SW846 8020A Nov 1990

Client Sample ID: MW-1

Spl#: 113174

Matrix: WATER

Sampled: January 6, 1997

Run#: 4808

Analyzed: January 8, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	SPIKE (%)	DILUTION FACTOR
GASOLINE BENZENE TOLUENE ETHYL BENZENE XYLENES MTBE	110 N.D. 0.68 N.D. N.D. N.D.	50 0.50 0.50 0.50 0.50 5.0	N.D. N.D. N.D. N.D. N.D. N.D.	73.4 113 112 113 111 99.0	1 1 1 1

Kayvan Kimyai

Chemist

Marianne Alexander

Gas/BTEX Supervisor

Environmental Services (SDB)

January 27, 1997

Submission #: 9701060

AQUA SCIENCE ENGINEERS INC

Atten: Scott Ferriman

Project: LIM, 250 8TH STREET

Project#:

2808

Received: January 7, 1997

re: One sample for Gasoline, BTEX & MTBE analysis.

Method: EPA 8015M SW846 8020A Nov 1990

Client Sample ID: MW-2

Spl#: 113175

Matrix: WATER

Sampled: January 6, 1997

Run#: 4808

Analyzed: January 9, 1997

ANALYTE	RESULT (ug/L)	REPORTING LIMIT (ug/L)	BLANK RESULT (ug/L)	BLANK SPIKE (%)	DILUTION FACTOR
GASOLINE BENZENE TOLUENE ETHYL BENZENE XYLENES MTBE	230000 11000 19000 4300 20000 N.D.	12000 120 120 120 120 120 120	N.D. N.D. N.D. N.D. N.D. N.D.	73.4 113 112 113 111 99.0	250 250 250 250 250 250

Surrogate recovery was outside QA/QC limits due to sample interference.

See Surrogate Summary page.

Kayvan Kimyai

Chemist

Marianne Alexander

Gas/BTEX Supervisor

Environmental Services (SDB)

January 27, 1997

Submission #: 9701060

AQUA SCIENCE ENGINEERS INC

Atten: Scott Ferriman

Project: LIM,250 8TH STREET

Project#: 2808

Received: January 7, 1997

re: Surrogate report for 2 samples for Gasoline, BTEX & MTBE Method: EPA 8015M SW846 8020A Nov 1990

Lab Run#: 4808 Matrix: WATER

			% I	Recovery
Sample#	Client Sample ID	Surrogate	Recovered	Limits
113174-1	MW-1	TRIFLUOROTOLUENE	126	65-135
113174-1	MW - 1	BROMOFLUOROBENZENE	100	65-135
113175-1	MW - 2	TRIFLUOROTOLUENE	118	65-135
113175-1	MW - 2	BROMOFLUOROBENZENE	95.4	65-135
113175-2	MW - 2	TRIFLUOROTOLUENE	111	65-135
113175-2	MW-2	BROMOFLUOROBENZENE	156	65 - 135
				Recovery
Sample#	QC Sample Type	Surrogate	Recovered	
113403-1	Reagent blank (MDB)	TRIFLUOROTOLUENE	115	65-135
113403-1	Reagent blank (MDB)	BROMOFLUOROBENZENE	88.0	6 5-13 5
113404-1	Spiked blank (BSP)	TRIFLUOROTOLUENE	118	65-135
113404-1	Spiked blank (BSP)	BROMOFLUOROBENZENE	111	65-135
113405-1	Spiked blank duplicate	(BSD)TRIFLUOROTOLUENE	85.6	65-135
113405-1	Spiked blank duplicate	(BSD)BROMOFLUOROBENZENE	113	65-135
113406-1	Matrix spike (MS)	TRIFLUOROTOLUENE	108	65-135
113406-1	Matrix spike (MS)	BROMOFLUOROBENZENE	82.5	65-135
113407-1	Matrix spike duplicate	(MSD)TRIFLUOROTOLUENE	109	65-135
113407-1	Matrix spike duplicate	(MSD)BROMOFLUOROBENZENE	85.5	65-135

V125 QCSURR1229 VINCE 27-Jan-97 12:0

060/113174-1/3175

Aqua Science Engineers, Inc. 2411 Old Crow Canyon Road, #4, San Ramon, CA 94583

Chain of Custody

(510) 820-9391 - FAX (51	(0) 837-4853									DAT	E	- 6 -	97_	PAGE		_OF <u> </u>		
SAMPLERS (SIGNATURE)		HONE NO.)		ECT N		Lin		50 (A		Yes	,		î	10. <u> </u>	28	708		_
ANALYSIS RI SPECIAL INSTRUCTIONS: 5-0-1	EQUEST	TPH- GASOLINE (EPA 5030/8015) TPH- GASOLINE/BTEX/MPG (EPA 5030/8015-8020)	TPH- DI ESEL (EPA 3510/8015)	PURGABLE AROMATICS (EPA 602/8020)	PURCABLE HALOCARBONS (EPA 601/8010)	VOLATILE ORGANICS (EDA 624/8240)	BASE/NUETRALS, ACIDS (EPA 625/8270)	OIL & CREASE (EPA 5520 E&F or (B&F))	LUFT METALS (5) (EPA 6010+7000)	TITLE 22 (CAM 17) (EPA 6010+7000)	(01-17	CLIE DUE: REF	#:315	SE UZIA			rsv.	,
SAMPLE ID. DATE TIME	MATRIX SAMPLES	TPH- (EPA TPH- (EPA	TPH- (EPA	PURG.	PURG.	VOLA (EPA	BASE (EPA	OIL (EPA	LUFT (EPA	TETE (EPA	TCLP (EPA	STLC- CA (EPA 131	REACTIVI CORROSIV IGNITABI					
MW-1 1-697 11:20 MW-2 1-697 15:55		X	X					X										
RELINQUISHED BY: Scott i. Ferrimon 1-7-9 (printed name) (date Company- ASE	7 /// (printed name)	120 (time) (date	e) (sig	LINQUI (nature) (ninted na mpany-	//// (br me)		7 9 7 (date	(A	nature)	Kor	ABOR) Wes	1/29 1/7/	<u>(</u> 1)	MENT	S:			