A REPORT DOCUMENTING THE
EXCAVATION OF CONTAMINATED
SOIL AND THE INSTALLATION
OF THREE GROUNDWATER MONITORING
WELLS WITH SUBSEQUENT DEVELOPMENT
AND SAMPLING

at

ALAMEDA FIRE STATION #2
635 PACIFIC STREET
ALAMEDA, CALIFORNIA

prepared for

City Of Alameda
Santa Clara Street @ Oak
Engineering Department
Alameda, California

A Report Documenting the
Installation of Three
Groundwater Monitoring Wells

at

FIRE STATION #2
635 PACIFIC STREET
ALAMEDA, CALIFORNIA

by

ZACCOR CORPORATION
Gary Zaccor
Project Manager

ENVIRONMENTAL TECHNICAL SERVICES
Helen Mawhinney
Senior Environmental Specialist

REGISTERED GEOLOGIST
Roger W. Greensfelder PhD
CA R.G. #3011

REGISTERED GEOLOGIST
R. W. GREENSFELDER
No. 003011
STATE OF CALIFORNIA

September 28, 1992

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1.0 INTRODUCTION

The following report documents the installation of three (3) groundwater monitoring wells by S & G Drilling and Environmental Technical Services on August 19, 1992 at, **Alameda Fire Station #2, 635 Pacific Street, Alameda, CA.**

2.0 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

2.1 TANK REMOVAL

On November 15, 1991, one (1) 285-gallon gasoline underground storage tank (UST) was removed from the subject site. The tank had previously contained diesel.

One soil sample was collected from the native soil beneath the tank. The sample contained a detectable amount of toluene at 6.5 ppb and total xylenes at 4.4 ppb.

A soil sample was collected from stockpiled fill material removed from the tank pit. This had a detectable amount of Total Petroleum Hydrocarbons as Diesel at 220 ppm and Xylenes at 52 ppb.

2.2 EXCAVATION OF CONTAMINATED SOIL

Excavation of contaminated soil was completed on August 17, 1992 and four soil samples were collected. A sample was collected from each sidewall vadose/capillary zone. These samples were designated as FSX-1 and FSX-4. Soil sample FSX2-A was collected subsequent to excavation of material around sample FSX2, and confirms removal of the slight contamination present around FSX2. See Table 1 for analytical results.

TABLE 1
ORIGINAL EXCAVATION
SOIL ANALYTICAL RESULTS
Total Petroleum Hydrocarbons as Gasoline
with Benzene, Toluene, Ethylbenzene and Xylenes
8/17/92

Results reported in mg/kg

Sample #	TPHg	TPHd	B	T	E	X
FSX-1	ND	ND	ND	ND	ND	ND
FSX-2	ND	7.1	ND	ND	ND	ND
FSX-3	ND	ND	ND	ND	ND	ND
FSX-4	ND	ND	ND	ND	ND	ND

FSSP1-FSSP4..This stockpile sample was composited with FSSP5 and FSSP6 which was collected on August 18, 1992. See Table II for analytical results.

ND=Not detected at lower detection limit for this compound

To ensure that all of the contaminated soil was excavated, additional excavation was performed on August 18, 1992 due to the 7.1 ppm detection of diesel in sidewall sample, FSX2. The stockpile sample collected on August 17, FSSP1-FSSP4, was composited with FSSP-5 and FSSP6 collected on August 18, 1992 for one analysis. Refer to Table II for analytical results.

TABLE II
ADDITIONAL EXCAVATION
SOIL ANALYTICAL RESULTS
Total Petroleum Hydrocarbons as Gasoline and Diesel
8/18/92

Results reported in mg/kg

Sample #	TPHg	TPHd
FSX2-A (2FSX2)*	NA	ND
FSSP1-FSSP6	ND	3.0

NA = Not Analyzed
ND = Not detected at lower detection limit for this compound
*as listed on Chain of Custody

An existing 2-inch groundwater monitoring well is located adjacent to and within 1.5' of the tank pit cavity. The well was constructed by Aqua Science Engineering on June 3, 1986. The well was constructed in compliance with Assembly Bill 1362 and the Groundwater Monitoring Guidelines for Hazardous Materials Storage drafted by the Alameda County Water District in May 1984. The well was placed in the assumed local down gradient direction. Gradient direction information differed within the area.

3.0 SCOPE OF SERVICES

S & G Drilling and Environmental Technical Services installed three 2" groundwater monitoring wells. The wells were installed to determine the impact, if any, of contamination upon the first encountered aquifer and to establish groundwater gradient beneath the site. Soil samples were collected within each soil boring. Soil was classified according to the Unified Soil Classification System. The wells were developed and a water sample collected from each well for analysis.

Construction, development and sampling of the wells was performed in accordance with guidelines set forth by the Regional Water Quality Control Board (RWQCB) San Francisco Bay Region and the Alameda County Department of Environmental Health Hazardous Materials Division.

The work was performed to comply with State and County Regulations in response to the presence of petroleum hydrocarbons discovered at the time of the UST removal.

3.1 SOIL BORING ADVANCEMENT

Three soil borings were advanced using a hydraulically driven truck/trailer mounted drill rig equipped with 8-1/4 inch O.D. hollow-stem augers and completed as two-inch diameter monitoring wells.

The augers were cleaned prior to arriving on site and decontaminated subsequent to drilling and before leaving the site.

The augers were decontaminated between borings using a hot high pressure wash.

3.2 MONITORING WELL INSTALLATION

Three monitoring wells were constructed within the soil borings. For the well locations, construction details, and boring logs for the wells, refer to Appendix C .

3.3 SOIL SAMPLE COLLECTION

Soil samples were collected using a California Modified Split Spoon Sampler driven by the drill rig. Immediately upon opening the sampler a brass sleeve was removed.

Each end of the brass sleeve was covered with teflon, fitted with plastic caps, sealed with duct tape, labeled, and placed on blue ice under chain of custody to be transported to a certified hazardous waste analytical laboratory. The split spoon sampler was decontaminated between samples using an Alconox wash and tap water rinse.

3.4 SOIL SAMPLE LOCATIONS

MW-2
Soil samples were collected at:
5.0' - 5.5'

* 9.0' - 9.5'*

MW-3
Soil samples were collected at:
5.0' - 5.5'

* 9.0' - 9.5'*

MW-4
Soil samples were collected at:
5.0' - 5.5'

* 8.0' - 8.5'

15.0' - 15.5'*

*Samples analyzed by Certified Lab.

3.5 SOIL SAMPLE ANALYSIS

Soil samples were analyzed for total petroleum hydrocarbons as gasoline with benzene, toluene, ethylbenzene, total xylenes (TPHg with BTEX using EPA Method 5030/8020) and total petroleum hydrocarbons as diesel (TPHd using EPA Method 3550).

Refer to Table III for analytical results.

3.6 ANALYTICAL RESULTS

TABLE III
MONITORING WELL SOIL RESULTS
TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
WITH BENZENE, TOLUENE, ETHYLBENZENE, XYLENES
AND DIESEL
8/19/92 (ppm)

Sample#	TPHd	TPHg	B	T	E	X
MW-2 9.0' - 9.5'	5.0	1.0	.005	.005	.005	.005
MW-3 9.0' - 9.5'	5.0	1.0	.005	.005	.005	.005
MW-4 8.0' - 8.5'	5.0	1.0	.005	.005	.005	.005

3.7 WELL DEVELOPMENT

Development and sampling of the wells was performed on August 20, 1992. All well effluent was contained in Department of Transportation approved 17-H, 55-gallon drums pending analysis of water samples. MW-2 was developed by evacuating water using a clean stainless steel bailer 1.5 inch by 3'. Approximately 10 gallons of water were evacuated during development. The well yield was low. Prior to development the total depth of MW-2 was 17.7' and depth to water was 7.55'. MW-3 was developed by evacuating water using a clean stainless steel bailer 1.5 inch by 3'. Approximately 10 gallons of water were evacuated during development. The well yield was low. Prior to development the total depth of MW-3 was 18.0' and depth to water was 8.05'. MW-4 was developed by evacuating water using a clean stainless steel bailer 1.5 inch by 3'. Approximately 10 gallons of water were evacuated during development. The well yield was low. Prior to development the total depth of MW-4 was 19.81' and depth to water was 7.44'.

Refer to Appendix D for Well Development Report.

3.8 WELL SAMPLING

On September 5, 1992 following development, each of the three wells was sampled. Sampling was performed using a stainless steel bailer which was decontaminated between wells using a Alconox wash and tap water rinse followed by a de-ionized water rinse.

4.0 RECOMMENDATIONS AND CONCLUSIONS

Soil and groundwater samples collected within MW-1, MW-2, and MW-3 contained no detectable amount of total petroleum hydrocarbons as gasoline, benzene, toluene, ethylbenzene, total xylenes, or total petroleum hydrocarbons as diesel.

Groundwater gradient within the local area was determined on at near by site to be flowing to the east in the late 1980s, and to the northeast in 1992.

Groundwater gradient was calculated to be flowing to the southeast beneath the subject site on Spetember 20, 1992.

It appears that groundwater gradient fluctuates within the local area. Therefore it is our recommendation that gradient beneath the site be determined on a monthly basis and a groundwater sample collected from the downgradient monitorng well located within 10 feet of the former gasoline/diesel underground storage tank while gradient is flowing toward the well.

5.0 REPORT

Please forward copies of this report, chain of custody documentation, and laboratory analytical reports to the San Francisco Regional Water Quality Control Board, and the Alameda County Department of Environmental Health Hazardous Materials Division.

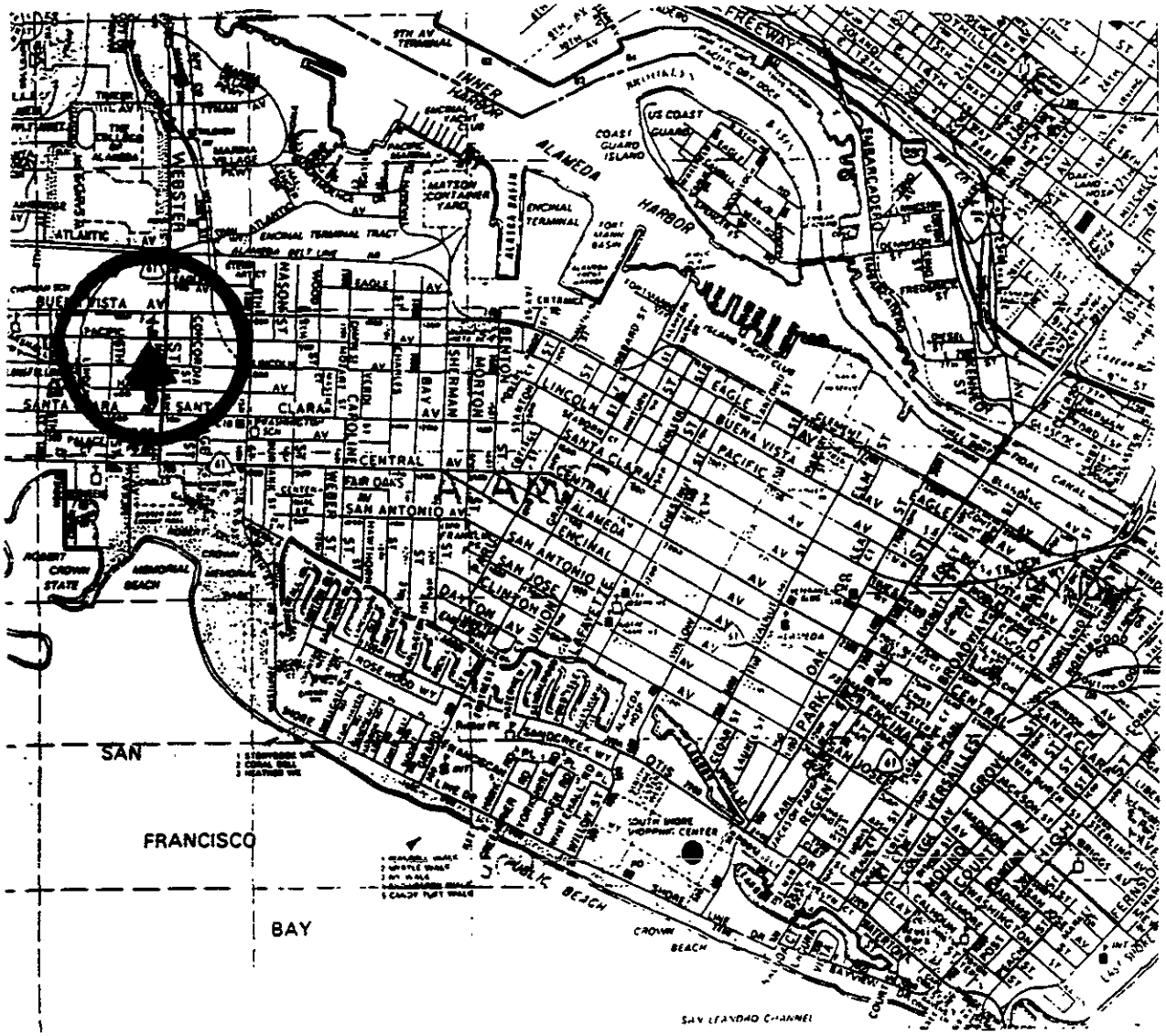
The following addresses have been included for your convenience:

Water Quality Control Board
San Francisco Bay Region
1800 Harrison Street
Room 700
Oakland, CA 94612

Alameda County Department
of Environmental Health
Hazardous Materials Division
80 Swan Way, Room 200
Oakland, CA 94621

APPENDIX A

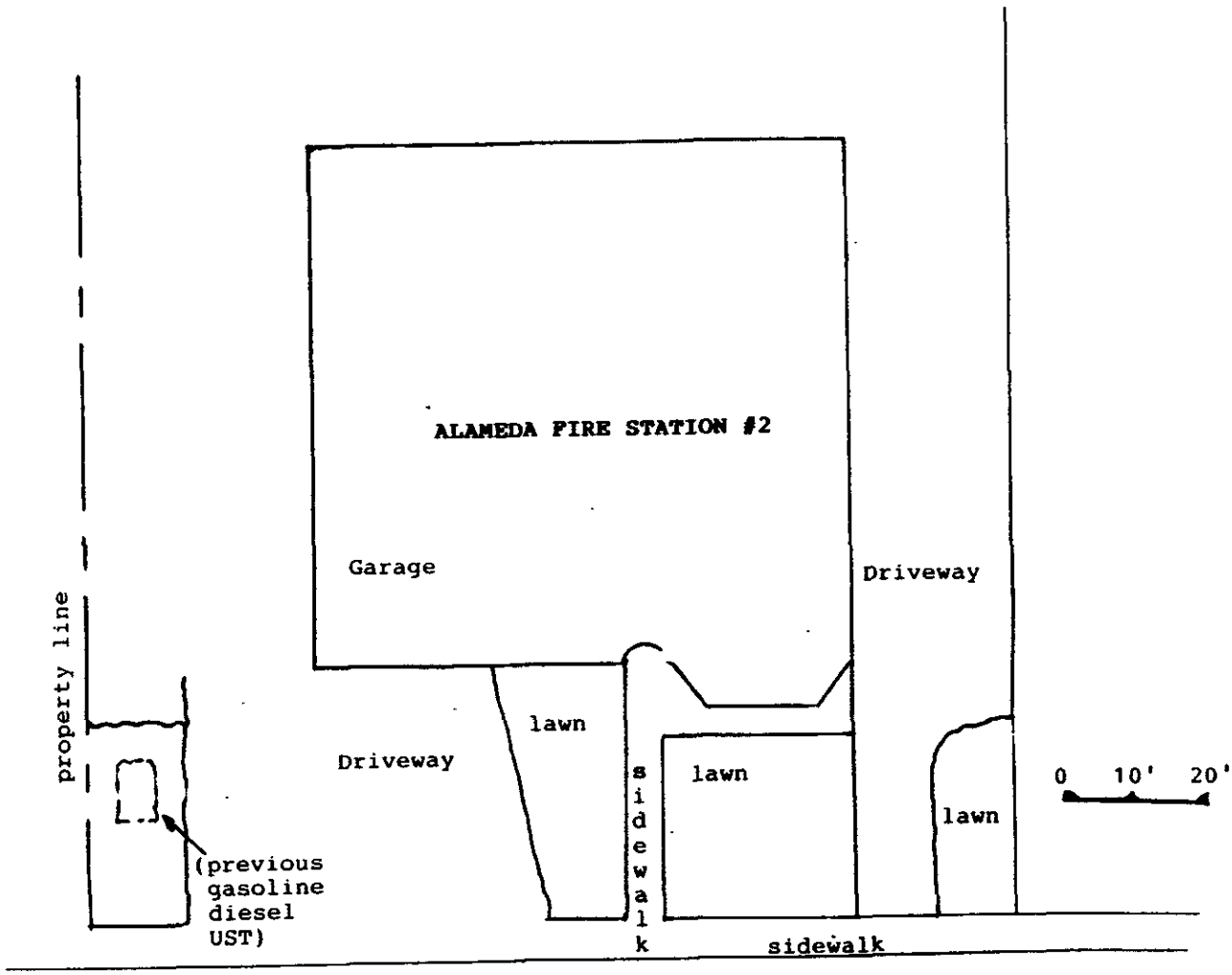
Maps



635 Pacific Avenue, Alameda, California

ENVIRONMENTAL TECHNICAL SERVICES	Site: **FIRE STATION #2** **635 PACIFIC STREET** **ALAMEDA, CALIFORNIA**	

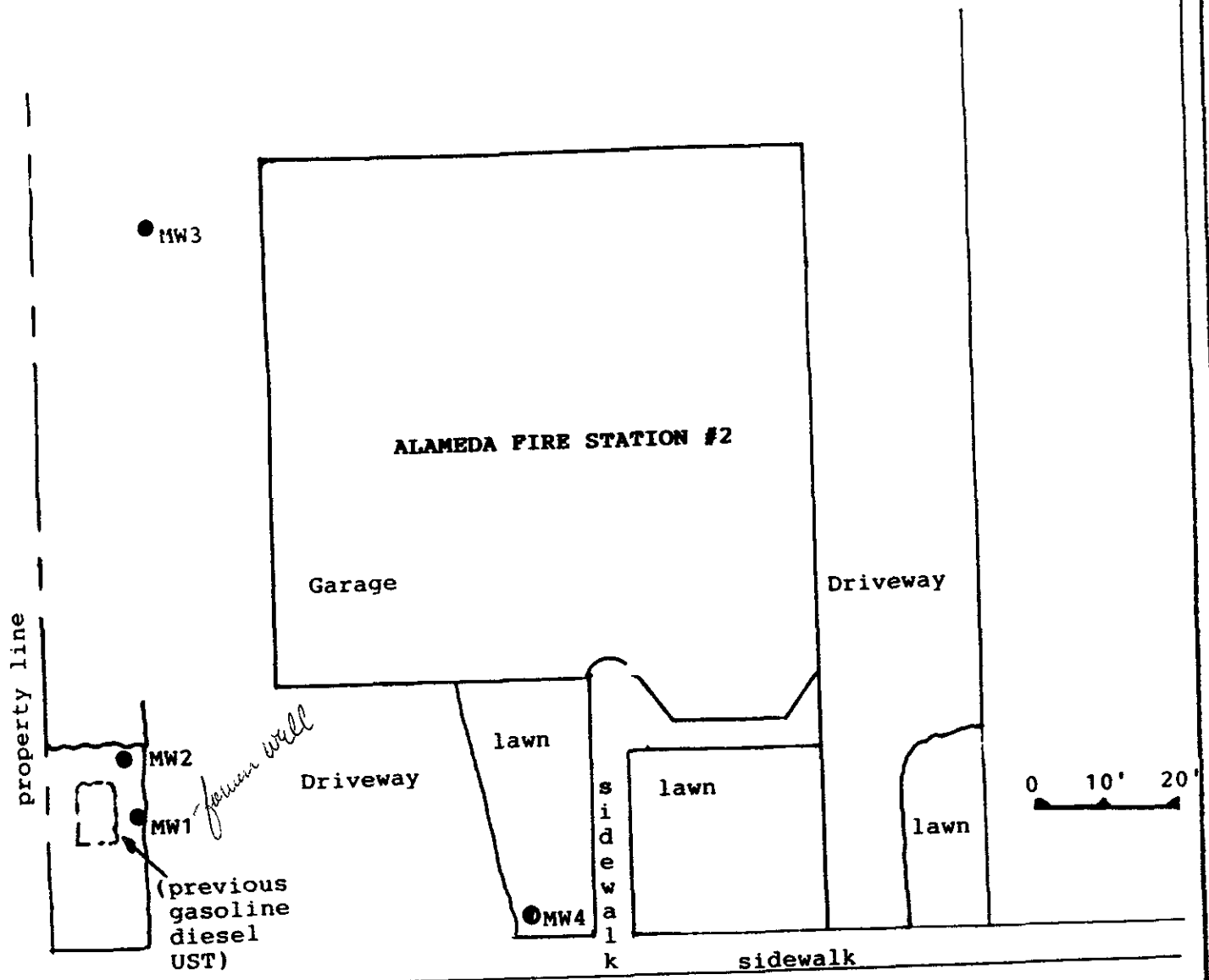
Figure 1.	Site Location Map	



ENVIRONMENTAL TECHNICAL SERVICES

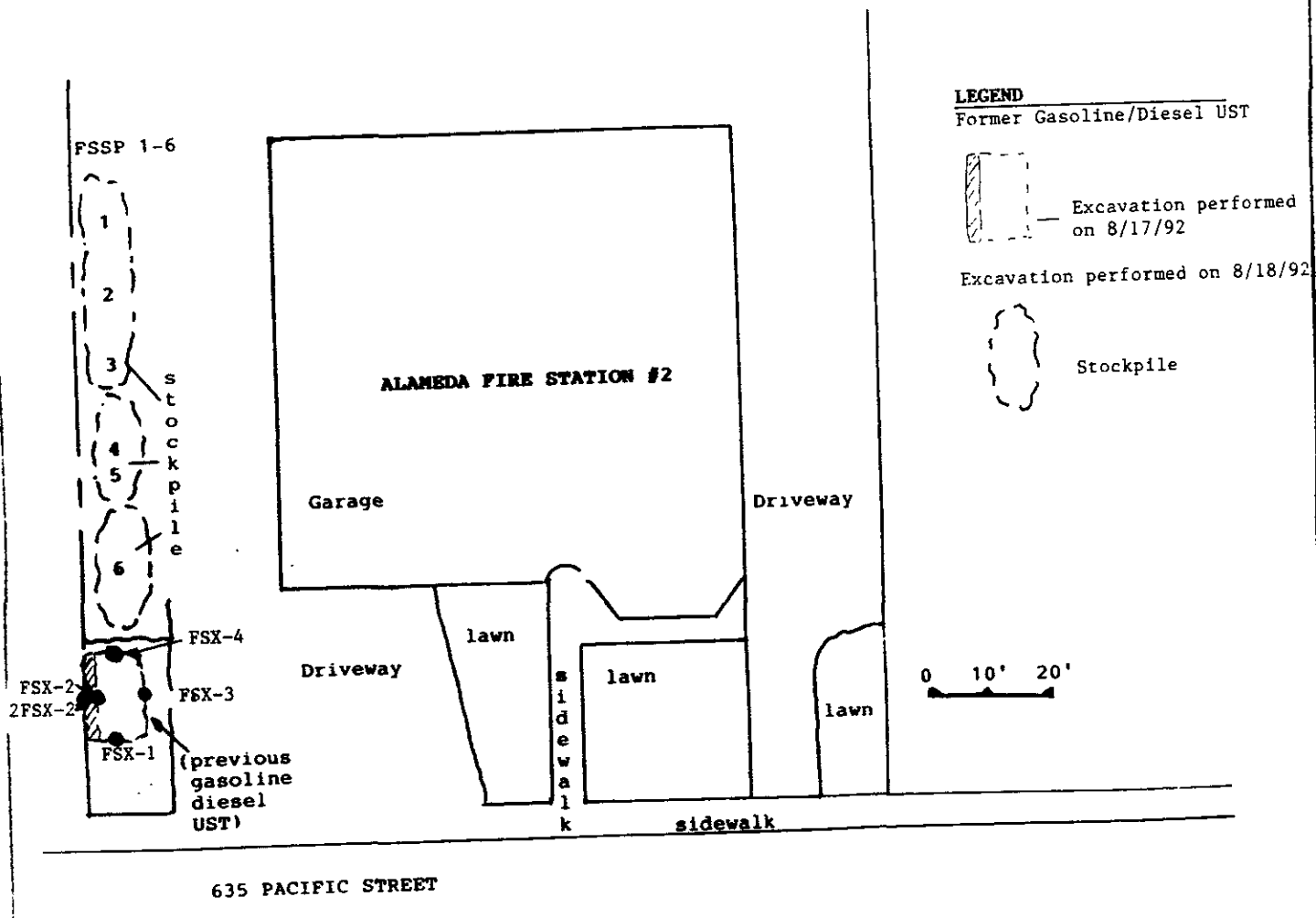
Site: **FIRE STATION #2**
635 PACIFIC STREET
ALAMEDA, CALIFORNIA

Figure 2. Tank Location Map



ENVIRONMENTAL TECHNICAL SERVICES	Site: FIRE STATION #2 635 PACIFIC STREET ALAMEDA, CALIFORNIA	Drawn by: Mawhinney 9/26/92

Figure 3. Monitoring Well Location Map 8/17/92



ENVIRONMENTAL TECHNICAL SERVICES

Site: **FIRE STATION #2**
635 PACIFIC STREET
ALAMEDA, CALIFORNIA

Figure 4. EXCAVATION & SAMPLING MAP

APPENDIX B

Original Tank Removal,
Original Sampling Report
Environmental Technical Services
& Zaccor Corporation, 11/20/92

November 20, 1991

City Hall of Alameda
Engineering Department
2263 Santa Clara at Oak Street
Room 207
Alameda, CA 94621
ATTN: Hank Wong

The following documentation concerns the initial tank removal and subsequent confirmatory sample collection, at:

ALAMEDA FIRE STATION #2
635 PACIFIC AVENUE
ALAMEDA, CALIFORNIA

On November 15, 1991, one 285 gallon underground storage tank was removed from the above referenced site. The tank recently contained diesel but had stored gasoline in past years.

Field Sampling was performed in accordance with state and local agency approved methodology, in the presence of Mr. Brian P. Oliva, Hazardous Materials Specialist for the Alameda County Department of Environmental Health.

See accompanying site diagram for the tank location, field sampling designations, and sampling depths.

UNDERGROUND STORAGE TANK INSPECTION

The tank condition was inspected upon removal. Rust and some pitting were noted. No holes were apparent. A slight hydrocarbon odor was present within the tank cavity backfill and native soil.

TANK PIT SAMPLING

A soil sample was collected from beneath the tank center. This was accomplished by the clearing of fill material and slough from the designated sample area. A backhoe bucket then obtained a sample from 12" to 18" into the native soil. The surface three inches of soil was removed from the backhoe bucket and a clean brass sleeve driven into the remaining soil.

TANK PIT SAMPLING-continued

The soil was packed into the brass sleeve to eliminate head space. Each sleeve end was immediately covered with a teflon sheet, fitted with plastic caps, sealed with duct tape, labeled, and placed under chain of custody, on blue ice for transport to a Certified Hazardous Waste Analytical Laboratory by laboratory personnel.

STOCKPILE SAMPLE COLLECTION

Approximately six cubic yards of soil was excavated from the tank pit cavity at the time of the tank removal. The excavated soil was stockpiled on asphalt and covered with Visqueen.

A composite soil sample was collected by dividing the stockpile into three sections. A brass sleeve was filled within each section by removing the surface two feet (2') of soil. A clean brass sleeve was driven into the remaining soil. The three soil samples were composited at a certified laboratory to be analyzed as one sample.

SAMPLE DATA

Matrix	Sample #	Location	Depth
Soil	TP-1	Beneath Tank Center	9'
Soil	SP1A-C	Stockpile	2'

SOIL SAMPLE ANALYSIS

#TP-1 and #SP1A-1C were analyzed for Total Petroleum Hydrocarbons as diesel (TPH-D, using EPA Method 3550), benzene, toluene, ethylbenzene and total xylenes (BTEX, using EPA Method 8020).

SOIL ANALYTICAL RESULTS

Sample#	TPH-D (ppm)	B (ppb)	T (ppb)	E (ppb)	X (ppb)
TP #1	ND	ND	6.5	ND	44
SP1A-C	220	ND	ND	ND	52

Not Detected at the lower detection limit.

RECOMMENDATIONS & CONCLUSIONS

The State Water Resources Control Board Document, Leaking Underground Fuel Tank Field Manual (LUFT), supported by the San Francisco Regional Water Quality Control Board (SFRWQCB), defines acceptable limits and appropriate actions for addressing UST contamination.

Stockpile composite sample, SP1A-C, contained a detectable amount of Total Petroleum Hydrocarbons as diesel at 220 ppm and total xylenes at 52 ppb.

Sample #TP-1 contained a detectable amount of toluene at 6.5 ppb and total xylenes at 44 ppb.

REPORT

Copies of the sampling report, chain of custody, and certified analytical report should be submitted to both the SFRWQCB and the Alameda County Department of Environmental Health.

The following addresses have been listed for your convenience:

Water Quality Control Board
San Francisco Bay Region
2101 Webster St. Rm. 500
Oakland Ca. 94612
ATTN: Fuel Leaks Division

Alameda County
Department of Environmental Health
Hazardous Materials Division.
80 Swan Way, Room 200
Oakland, California 94621

It has been a pleasure working with you. If I can be of further service please call me at (415) 363-2181.

Sincerely,
ZACCOR CORPORATION

Gary Zaccor

ALAMEDA FIRE DEPARTMENT #2, 635 Pacific Ave, Alameda, California

11/15/91

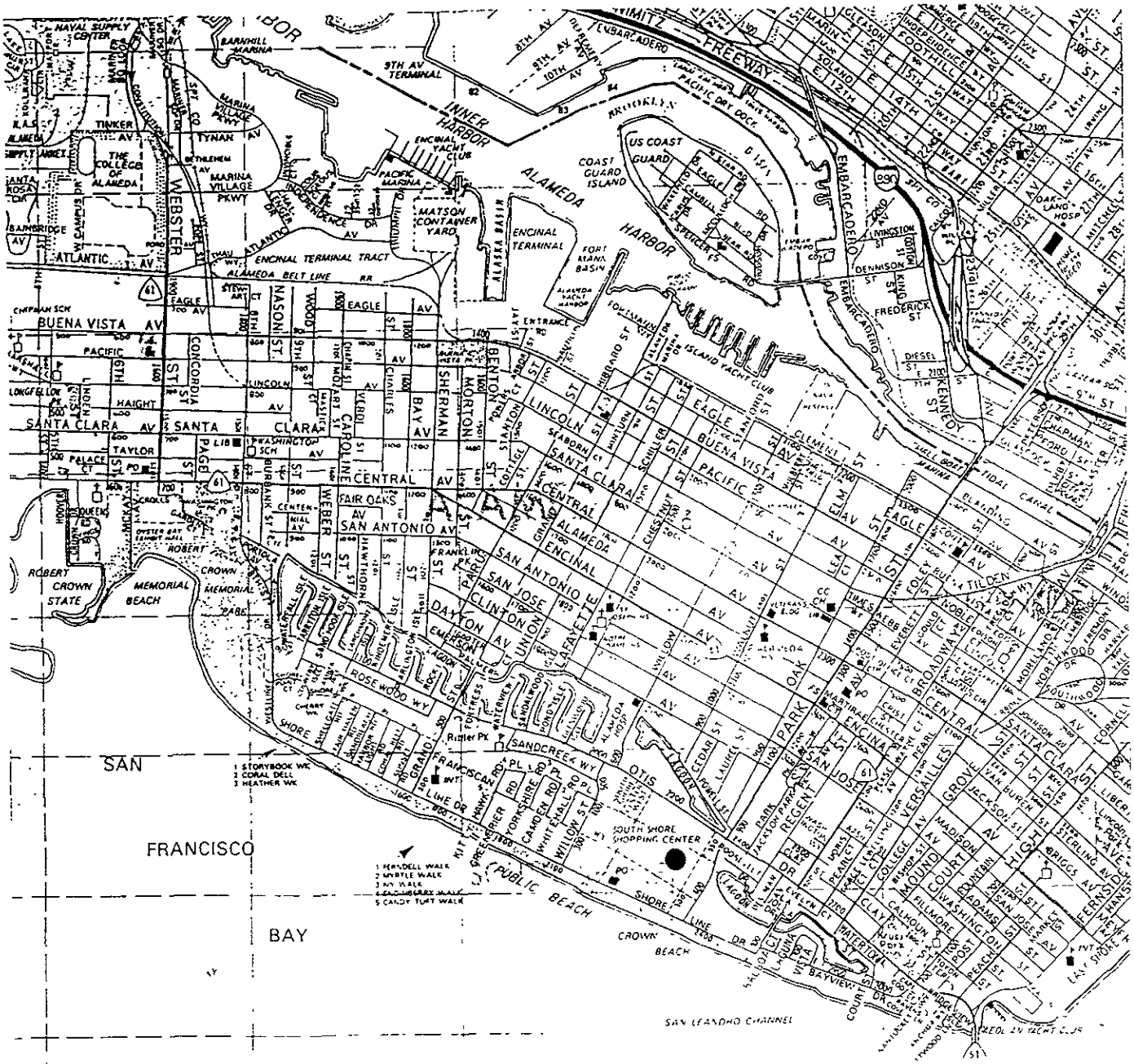
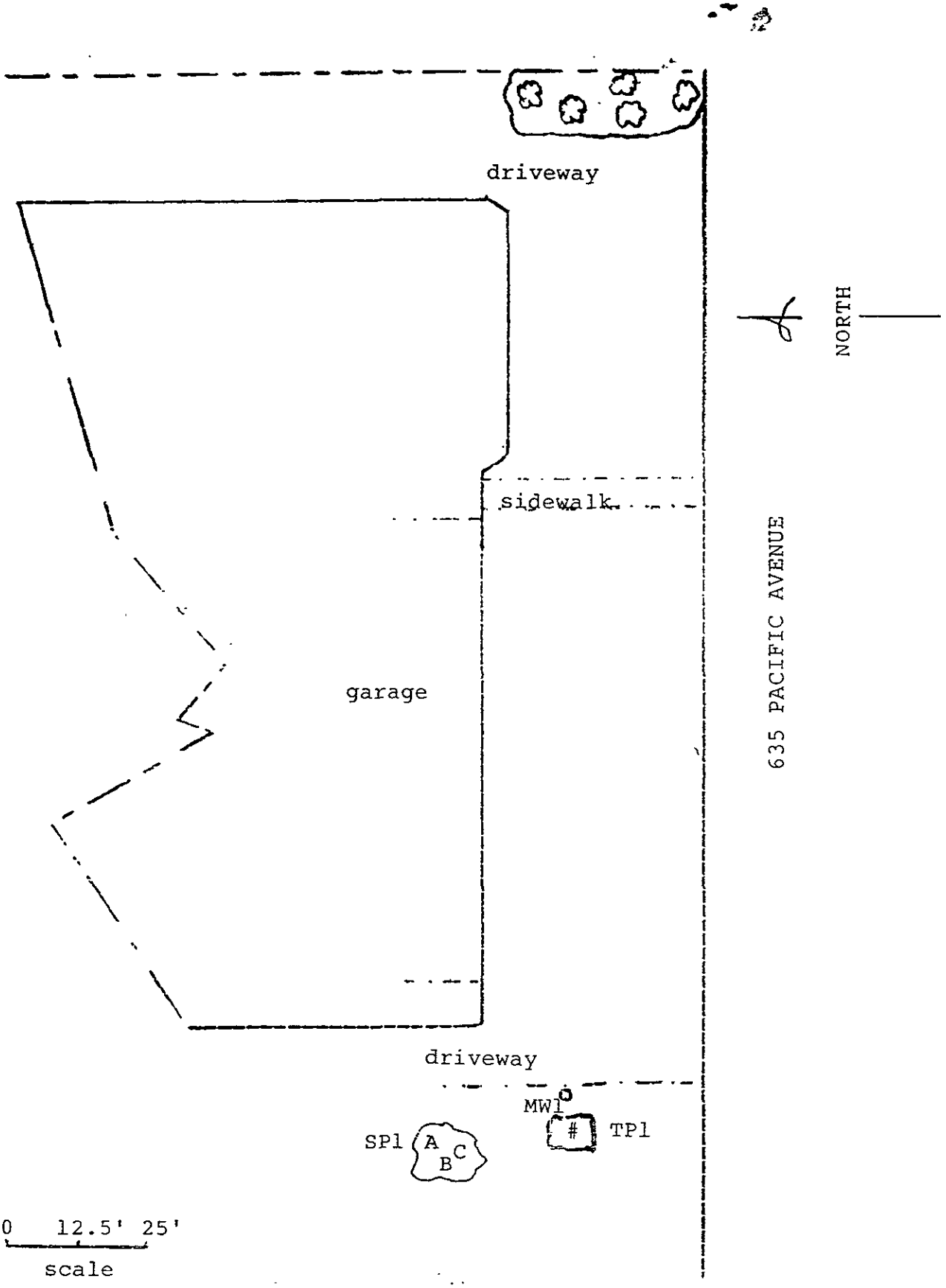


Fig.1 Site Location Map.

ENVIRONMENTAL
TECHNICAL
SERVICES

at: ALAMEDA FIRE STN. #2.

11/15/91



CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

November 15, 1991 ChromaLab File No.: 1191152

ZACCOR CORPORATION

Attn: Gary Zaccor

RE: Two rush soil sample for BTEX and Diesel analysis

Project Name: ALAMEDA FIRE DEPT.
Project Number: ALM.FIRE
Date Sampled: Nov. 15, 1991 Date Submitted: Nov. 15, 1991
Date Extracted: Nov. 15, 1991 Date Analyzed: Nov. 15, 1991

RESULTS:

Sample I.D.	Diesel (mg/kg)	Benzene (µg/kg)	Toluene (µg/kg)	Ethyl Benzene (µg/kg)	Total Xylenes (µg/kg)
TP-1	N.D.	N.D.	6.5	N.D.	44
SP1A-1C	220	N.D.	N.D.	N.D.	52
LANK	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	89.2%	85.7%	93.9%	100.8%	106.6%
DETECTION LIMIT	1.0	5.0	5.0	5.0	5.0
METHOD OF ANALYSIS	3550/ 8015	8020	8020	8020	8020

ChromaLab, Inc.

David Duong
Chief Chemist

Eric Tam
Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583
510/831-1788 • Facsimile 510/831-8798
Federal ID #68-0140157

ZACCOR COMPANIES, INCORPORATED Environmental Technical Services

CLIENT CHAIN-OF-CUSTODY RECORD

PROJECT NUMBER: ALM.FIRE

PROJECT NAME: Alameda Fire Dept 635 Pacifica, Alameda

Send Report Attention of: Gary Zaccor, Menlo Park Ca, 791 Hamilton Ave

Report Due: / /

Verbal Due: / /

Type of Analysis

LAB FILE # 119152

WORK ORDER # 4194

Sample Number	Date	Time	Comp	Grab	Station Location	Number of Cntnrs	Type of Containers	TPH as Diesel	BTEX	Samples	Initial
TP-1	11/15/91	9:05 AM		X	Beneath 9' Tank Center	1	BRASS SLEEVE	X	X		
SP1A-1C	11/15/91	9:10 AM	X		Stock pile 2'	3	BRASS SLEEVES	✓	✓		

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
Helen Mawdsley	11-15-91		
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time

Remarks: SAME DAY ANALYSIS

SAMPLE DISPOSAL:
Return to Client [ ]
Soil Disposal by Anametrix ($5.00 per container) [ ]

COMPANY: ZACCOR (0121)
ADDRESS: 791 Hamilton Ave Menlo Park, Ca
PHONE : 363-2181 FAX :

5025

APPENDIX C

Soil Boring Logs

MONITORING WELL BORING LOGS

ENVIRONMENTAL TECHNICAL SERVICES
for: ZACCOR CORPORATION

AT:
FIRE STATION #2
635 PACIFIC STREET
ALAMEDA, CALIF

MW-2

Drilling Method : Augers

Sample Method : Split Spoon

Project Manager: Gary Zaccor

DEPTH	SAMPLE COLLECTED: INT. SAMPLE#	Soil Description	USCS	LOG	BLOW COUNTS	WELL CONSTRUCTION
		SANDY SILT, brown, 15% sand, dry, loose	ML			0-3.5' Grout 3.5-4.5 Bentonite Pellets 4.5-18 Lonestar #2/12 sand Christy Box 0-5' 2" PVC Blank 5'-18' 2" PVC 0.010" Slot
		CLAYEY SILT, fine, grey-brown, 12% clay damp, loose.	ML			
5'	MW-2 5.5-6'	CLAYEY SAND, fine, brown, 25% clay, moist, poor cohesion Minor blk. mottling Plant fibers, No fuel odor.	SC		6,4,20	
10'	MW-2 9'-9.5'	CLAYEY SAND, fine, orange-brown, 10% clay moderatly cohesive, wet, plant fibers. No fuel odor. Inclusions of gray sand columns 1" diameter, red rimmed, possible of roots.	SC		32,35,80	
15'					25,33 50	
		Total Depth = 18'				
20'						
25'						
30'						

MONITORING WELL BORING LOGS

ENVIRONMENTAL TECHNICAL SERVICES
for: ZACCOR CORPORATION

R.G. M. Bushnell #3633

AT:
FIRE STATION #2
635 PACIFIC STREET
ALAMEDA, CALIFORNIA

MW-3

Drilling Method : Augers

Sample Method : Split Spoon

Project Manager: Gary Zaccor

DEPTH	SAMPLE COLLECTED: INT. SAMPLE#	Soil Description	USCS	LOG	BLOW COUNTS	WELL CONSTRUCTION
		Asphalt 1.5, coarse rock base 4" SILTY CLAY, brown, wet cohesive.	CL			3.5-4.5 Bentonite pellet Locked Well Cap 0-5' Blank 2" PVC
		CLAYEY SILT, dk. brown, wet				
5'	MW-3 5'-5.5'	SILTY SAND, brown, 10% clay, minor blk. motteling, plant fibers, moist, No fuel odor.	SM		6,5,5	
10'	MW-3 9'-9.5'	SILTY SAND, fine, brown, 30% silt, wet cohesive, trace plant fibers & blk. motteling in lowest 6".	CL		16,24,28	4.5 15 #2/12 sand 2" PVC 0.010" slot 5'-15'
15'	MW-3 15-16.5'	CLAYEY SILT, very fine, brown/gray, mottled, 20% clay saturated, moderately cohesive. Trace black mottling in lowest 6".	SC		13 20 21	
20'		Boring terminated at the 18.0' depth Converted to a 2" monitoring well 8-19-92				
25'						
30'						

MONITORING WELL BORING LOGS

ENVIRONMENTAL TECHNICAL SERVICES
for: ZACCOR CORPORATION

AT:
FIRE STATION #2
635 PACIFIC STREET
ALAMEDA, CALIFORNIA

MW-4

R.G. M. Bushnell #3633

Drilling Method : Augers

Sample Method : Split Spoon

Project Manager: Gary Zaccor

8-19-92

DEPTH	SAMPLE COLLECTED: INT. SAMPLE#	Soil Description	USCS	LOG	BLOW COUNTS	WELL CONSTRUCTION
		CLAYEY SAND, fine brown, 15% clay, dry, unconsolidated	SC			Grout: Locked Well Cap
		CLAYEY SILT, light brown, 20% clay damp, non-cohesive	ML			Bentonite pellet: 0-5' 2" Blank PVC
5'	MW-4 5'-5.5'	FINE SAND, 10% clay lt. brown/med brown poor cohesion, moist. No petroleum petroleum hydrocarbon odor.	SP		4,6,6	
10'	MW-4 8'-8.5'				18 32 34	4.5'-20' #2/12 sand: 5'-20' 2" 0.010" slot
15'	MW-4 15'-15.5	FINE SAND, clayey gray/brown, mottled, saturated No petroleum hydrocarbon odor.	SP			
20'		Boring terminated at the 20.0' depth Converted to a 2" monitoring well on 8/19/92				
25'						
30'						

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

August 18, 1992 ChromaLab File No.: 0892132

ZACCOR CORPORATION

Attn: Gary Zaccor

RE: Four rush soil samples for Diesel and Gas/BTEX analyses

Project Name: FIRE STN. #2
Project Location: 635 Pacific St., Alameda, CA
Project Number: Fire Stn. #2
Date Sampled: Aug. 17, 1992 Date Submitted: Aug. 17, 1992
Date Extracted: Aug. 17, 1992 Date Analyzed: Aug. 17, 1992

RESULTS:

Sample I.D.	Gasoline (mg/Kg)	Diesel (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)
FSX-1	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
FSX-2	N.D.	7.1	N.D.	N.D.	N.D.	N.D.
FSX-3	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
FSX-4	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE REC.	107%	85%	112%	106%	102%	103%
DUP SPIKE REC	----	92%	117%	114%	107%	108%
DET. LIMIT	1.0	1.0	5.0	5.0	5.0	5.0
METHOD OF ANALYSIS	5030/ 8015	3550/ 8015	8020	8020	8020	8020

ChromaLab, Inc.

Billy Thach
Analytical Chemist

Eric Tam
Laboratory Director

ENVIRONMENTAL TECHNICAL SERVICES

CHROMALAB FILE # 892132
ORDER # 7388

CHAIN OF CUSTODY RECORD

PROJECT NO. | Fire Stn #2 SITE NAME & ADDRESS
Fire Stn #2 | 635 Pacific St. Alameda, Ca
WITNESSING AGENCY / INSPECTOR NAME / DATE
Juliet Shen / Alameda Co. Hlth Dept

ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION	TPH (Gasoline) & B, T, X, & E	TPH (Diesel) & ~~B, T, X, & E~~	Total Oil & Grease	Halogenated HC's	B, T, X & E	Heavy Metals		REMARKS
FSX-1	8/17/92		X		S End of Tank Pit (Wall)	X	X						
FSX-2			X		W Tank Pit Wall	X	X						
FSX-3			X		E Tank Pit Wall	X	X						
FSX-4			X		N End of Tank Pit (Wall)	X	X						
FSSP1-FSSP4			X		Stockpile								Hold (Composite Sample)

(1) See attached "Table 2" for specific analysis method.

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Helen Mawhinney	8/17/92 12:36	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Rec'd for Laboratory by: (Signature)

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in Ice?
2. Will samples remain refrigerated until analyzed?
3. Did any samples received for analysis have head space?
4. Were samples in appropriate containers and properly packaged?

Signature | Title | Date

Rev: 12-88

APPENDIX D

Groundwater Development Report

MONITORING WELL SAMPLING DATA/MW-2

Project Name:	Well#
ALAMEDA FIRE STATION# 2	MW-2

Date: September 4, 1992

Name:	Time Began:
Mawhinney	3:12

DEPTH OF WELL(ft.)	DEPTH TO WATER(ft.)	WELL DIAM.
17.7	7.33	2"

Time	Gallons	Salinity	pH	Temp.	Cond.
3:12	1	.05	7.5	25 C	1.46
3:30	3	.05	7.3	23 C	1.00
3:41	5	.04	7.0	23 C	1.26
3:54	8	.04	7.3	23 C	1.20
4:11	10	.04	7.3	23 C	1.24

Volume Evacuated	Purging Equip.	Sampling Equip.
10 gallons	Stainless Steel Bailer	Stainless Steel Bailer

Depth to Water Upon Completion of Sampling

Not measured. Recharge very good

Sheen	Floating Product	Sample Color	Odor
no	no	gold	no

Sediment/Foreign Matter: sample clear

Sample ID#	Analysis	Laboratory
MW-2	TPHg, BTEX	S & W Lab.

Sample Containers	Preservative
3/ 40-ml VOAs	None (24 hr analysis)

MONITORING WELL SAMPLING DATA/MW-3

Project Name:	Well#
ALAMEDA FIRE STATION# 2	MW-3

Date: September 4, 1992

Name:	Time Began:
Mawhinney	4:29

DEPTH OF WELL(ft.)	DEPTH TO WATER(ft.)	WELL DIAM.
17.73	7.93	2"

Time	Gallons	Salinity	pH	Temp.	Cond.
12:21	1	.04	7.6	26 C	1.25
12:34	3	.05	7.5	25 C	1.38
12:48	5	.04	7.3	23 C	1.26
1:01	8	.04	7.2	24 C	1.26
1:15	10	.04	7.3	23 C	1.24

Volume Evacuated	Purging Equip.	Sampling Equip.
10 gallons	Stainless Steel Bailer	Stainless Steel Bailer

Depth to Water Upon Completion of Sampling

Recharge very good

Sheen	Floating Product	Sample Color	Odor
no	no	gold	no

Sediment/Foreign Matter: sample clear

Sample ID#	Analysis	Laboratory
MW-3	TPHg, BTEX	S & W Lab.

Sample Containers	Preservative
3/ 40-ml VOAs	None (24 hr analysis)

MONITORING WELL SAMPLING DATA/MW-4

Project Name:	Well#
ALAMEDA FIRE STATION# 2	MW-4

Date: September 4, 1992

Name:	Time Began:
Mawhinney	4:29

DEPTH OF WELL(ft.)	DEPTH TO WATER(ft.)	WELL DIAM.
19.81	7.26	2"

Time	Gallons	Salinity	pH	Temp.	Cond.
2:01	1	.04	7.6	26 C	1.25
2:16	3	.05	7.5	25 C	1.38
2:25	5	.04	7.3	23 C	1.26
2:45	8	.04	7.2	24 C	1.26
3:01	10	.04	7.3	23 C	1.24

Volume Evacuated	Purging Equip.	Sampling Equip.
10 gallons	Stainless Steel Bailer	Stainless Steel Bailer

Depth to Water Upon Completion of Sampling

Recharge very good

Sheen	Floating Product	Sample Color	Odor
no	no	gold	no

Sediment/Foreign Matter: sample clear

Sample ID#	Analysis	Laboratory
MW-4	TPHg, BTEX	S & W Lab.

Sample Containers	Preservative
3/ 40-ml VOAs	None (24 hr analysis)

APPENDIX E

Soil Analytical Results

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

August 19, 1992 ChromaLab File No.: 0892149

ZACCOR CORPORATION

Attn: Gary Zaccor

RE: Two rush soil samples for Gasoline and Diesel analyses

Project Name: FIRE STN #2
Project Location: 635 Pacific St., Alameda
Date Sampled: Aug. 18, 1992 Date Submitted: Aug. 18, 1992
Date Extracted: Aug. 18, 1992 Date Analyzed: Aug. 18, 1992

RESULTS:

Sample I.D.	Gasoline (mg/Kg)	Diesel (mg/Kg)
2FSX-2	----	N.D.
FSSP1-FSSP6*	N.D.	3.0
BLANK	N.D.	N.D.
SPIKED RECOVERY	94%	96%
DUPLICATE SPIKED RECOVERY	----	91%
DETECTION LIMIT	1.0	1.0
METHOD OF ANALYSIS	5030/8015	3550/8015

*6 in 1 soil composite.

ChromaLab Inc.,

Yiu Tam
Analytical Chemist

Eric Tam
Laboratory Director

CHROMALAB, INC.

2239 Omega Road, #1 • San Ramon, California 94583
510/831-1788 • Facsimile 510/831-8798

ORDER # 7433 dy

DATE _____ PAGE _____ OF _____

PROJ. MGR. Gary Zador
COMPANY ZADOR CORP
ADDRESS 791 Hamilton Ave
Menlo Park, Ca 94025

SAMPLERS (SIGNATURE) Helen Mawhinney (PHONE NO.)

SAMPLE ID	DATE	TIME	MATRIX	LAB ID.	TPH - Gasoline (EPA 5030, 8015)	TPH - Gasoline (5030, 8015) w/BTeX (EPA 602,8020)	TPH - Diesel (EPA 3510/3550, 8015)	PURGEABLE AROMATICS BTEX (EPA 602, 8020)	PURGEABLE HALOCARBONS (EPA 601, 8010)	VOLATILE ORGANICS (EPA 624, 8240, 524.2)	BASE/NEUTRALS, ACIDS (EPA 625/627, 8270, 525)	TOTAL OIL & GREASE (EPA 5520 E&F)	PESTICIDES/PCB (EPA 608, 8080)	PHENOLS (EPA 604, 8040)	TOTAL RECOVERABLE HYDROCARBONS (EPA 418.1)	METALS: Cd, Cr, Pb, Zn, Ni	CAM METALS (17)	PRIORITY POLLUTANT METALS (13)	EXTRACTION (TCLP, STLC)	NUMBER OF CONTAINERS
2FSX-2	8/8/92		Soil				✓												Immediate	
FSSP5 FSSP6	↓		↓		✓		✓												Stockpile (comp) immediate	
					Phone results to (408) 264-9095															
2 Priority					Fax to (408) 267-6427															

PROJECT INFORMATION

PROJECT NAME: Fire Stn # 2 Alameda
PROJECT NUMBER: 635 Pacific St, Alameda
SHIPPING ID. NO.
VIA.

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS	3
CHAIN OF CUSTODY SEALS	
RECD GOOD CONDITION/COLD	
CONFORMS TO RECORD	
LAB NO.	

SPECIAL INSTRUCTIONS/COMMENTS:
Composite FSSP1 - FSSP4 from work order # 892132 with FSSP5 & FSSP6 from this Chain of Custody

RELINQUISHED BY 1.	RELINQUISHED BY 2.	RELINQUISHED BY 3.
(SIGNATURE) Helen Mawhinney (TIME)	(SIGNATURE) (TIME)	(SIGNATURE) (TIME)
(PRINTED NAME) Helen Mawhinney (DATE) 8/10/92	(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)
(COMPANY) Env. Tech. Services	(COMPANY)	(COMPANY)
RECEIVED BY 1.	**RECEIVED BY 2.**	**RECEIVED BY (LABORATORY) 3.**
(SIGNATURE) (TIME)	(SIGNATURE) (TIME)	(SIGNATURE) Gary Cook 8/10/92 (TIME)
(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)	(PRINTED NAME) Gary Cook 14:20 (DATE)
(COMPANY)	(COMPANY)	(LAB) Chromalab

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

AFS#2/MW\1428\012026

Zaccor Corporation
791 Hamilton Avenue
Menlo Park, CA 94025
Attn: Gary Zaccor
Project Manager

Date Sampled: 08-19-92
Date Received: 08-19-92
Date Analyzed: 08-27-92

Sample Number	Sample Description	Detection Limit ppm	SOIL Total Petroleum Hydrocarbons as Diesel ppm
	Alameda Fire Station #2 635 Pacific Street Alameda, CA		
082154	MW-2 9'-9.5'	5.0	<5.0
082155	MW-3 9'-9.5'	5.0	<5.0
082156	MW-4 8'-8.5'	5.0	<5.0

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA method 3550 and TPH LUFT.
(ppm) = (mg/kg)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

AFS#2/MW\1428\012026

Zaccor Corporation
791 Hamilton Avenue
Menlo Park, CA 94025
Attn: Gary Zaccor
Project Manager

Date Sampled: 08-19-92
Date Received: 08-19-92
Date Analyzed: 08-27-92

Sample Number	Sample Description
082154	Project # AFS#2/MW Alameda Fire Station #2 635 Pacific Street MW-2 9'-9.5' SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	<1.0
Benzene	0.005	<0.005
Toluene	0.005	<0.005
Xylenes	0.005	<0.005
Ethylbenzene	0.005	<0.005

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.
(ppm) = (mg/kg)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

AFS#2/MW\1428\012026

Zaccor Corporation
791 Hamilton Avenue
Menlo Park, CA 94025
Attn: Gary Zaccor
Project Manager

Date Sampled: 08-19-92
Date Received: 08-19-92
Date Analyzed: 08-27-92

Sample Number	Sample Description
082155	Project # AFS#2/MW Alameda Fire Station #2 635 Pacific Street MW-3 9'-9.5' SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	<1.0
Benzene	0.005	<0.005
Toluene	0.005	<0.005
Xylenes	0.005	<0.005
Ethylbenzene	0.005	<0.005

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX diatinction.
(ppm) = (mg/kg)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

5021 Blum Road, Suite 3 • Martinez, CA 94553
Phone (415) 372-3700 • Fax (415) 372-6955

AFS#2/MW\1428\012026

Zaccor Corporation
791 Hamilton Avenue
Menlo Park, CA 94025
Attn: Gary Zaccor
Project Manager

Date Sampled: 08-19-92
Date Received: 08-19-92
Date Analyzed: 08-27-92

Sample Number	Sample Description
082156	Project # AFS#2/MW Alameda Fire Station #2 635 Pacific Street MW-4 8'-8.5' SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	<1.0
Benzene	0.005	<0.005
Toluene	0.005	<0.005
Xylenes	0.005	<0.005
Ethylbenzene	0.005	<0.005

QA/QC: Sample blank is none detected

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.
(ppm) = (mg/kg)

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

ENVIRONMENTAL TECHNICAL SERVICES

COPY

CHAIN OF CUSTODY RECORD 082154

PROJECT NO.	SITE NAME & ADDRESS
AES#2/MW	Alameda Fire Stn #2, 6th Pacific St Alameda

WITNESSING AGENCY / INSPECTOR NAME / DATE: Juliett Shin / Alam. Hlth. Envir. Dept

ID.NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION	TPH (Gasoline) & B,T,X, & E	TPH (Diesel) & B,T,X & E	Total Oil & Grease	Halogenated HC's	B,T,X & E	Heavy Metals		REMARKS
MW-2	8/19/92		✓		5'-5.5'								HOLD
MW-2	↓		↓		9'-9.5'	✓	✓						082154
MW-3	↓		↓		5'-5.5'								HOLD
MW-3	↓		↓		9'-9.5'	✓	✓						082155
MW-4	↓		↓		5'-5.5'								HOLD
MW-4	↓		↓		8'-8.5'	✓	✓						082156
MW-4	↓		↓		15'-15.5'								HOLD
													Fax copy of CofC to
													408 263-6427

(1) See attached "Table 2" for specific analysis method.

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Kelley Mauhinney	8-19-92 12:45	David R Levine
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Rec'd for Laboratory by: (Signature)

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in ice?
2. Will samples remain refrigerated until analyzed?
3. Did any samples received for analysis have head space?
4. Were samples in appropriate containers and properly packaged?

Signature ______ Title ______ Date ______

Rev: 12-88

See I+ #3541

Travis [illegible]

APPENDIX F

Groundwater Analytical Results

S&W
Soil and Water
Environmental
Laboratory

Drinking Water
Waste Water ○ Asbestos
Hazardous Waste – Soil
Calderon Testing – Air

14072 W. Park Avenue
Boulder Creek, CA 95006
(408) 338-3053

Laboratory Report

Client: Environmental Tech. Services
1548 Jacob Ave.
San Jose CA 95118

Report Date: 09/29/92

Sample Site: Alam Fire Dept
635 Pacific Street
Alameda
Alam Fire #2

Date Received: 09/05/92

Analysis Requested	Procedure	Date Analyzed
Total Hydrocarbons - Gas	EPA 5030	09/05/92
Total Hydrocarbons - Diesel	EPA 3510	
BTEX	EPA 602	

S&W Ref. #	Client Ref. #	Matrix/Analysis	Concentration	Detection Limit
2492-ET1-A	MW-2	Water/TPH-G	*	50 ppb
2492-ET1-A	MW-2	Water/TPH-D	*	50 ppb
2492-ET1-A	MW-2	Water/BTEX		
		Benzene	*	0.5 ppb
		Toluene	*	0.5 ppb
		Ethylbenzene	*	0.5 ppb
		Xylenes	*	0.5 ppb
2492-ET1-B	MW-4	Water/TPH-G	*	50 ppb
2492-ET1-B	MW-4	Water/TPH-D	*	50 ppb
2492-ET1-B	MW-4	Water/BTEX		
		Benzene	*	0.5 ppb
		Toluene	*	0.5 ppb
		Ethylbenzene	*	0.5 ppb
		Xylenes	*	0.5 ppb

* No detectable amount @ detection limit

Analyst Signature: R. W. Lawson

S&W
Soil and Water
Environmental
Laboratory

Drinking Water
Waste Water ○ Asbestos
Hazardous Waste – Soil
Calderon Testing – Air

14072 W. Park Avenue
Boulder Creek, CA 95006
(408) 338-3053

Laboratory Report

Client	Report Date
Enviornmental Tech. Services 1548 Jacob Ave. San Jose CA 95118	03/10/92

Sample Site	Date Received
Alameda Fire Det. 635 Pacific St. Alameda, CA Alam Fire #2	03/05/92

Analysis Requested	Procedure	Date Analyzed
Total Hydrocarbons - Gas	EPA 5030	03/06/92
Total Hydrocarbons - Diesel	EPA 3510	
BTEX	EPA 602	

S&W Ref. #	Client Ref. #	Matrix/Analysis	Concentration	Detection Limit
2492-ET1-C	MW-3	Water/TPH-G	*	50 ppb
2492-ET1-C	MW-3	Water/TPH-D	*	50 ppb
2492-ET1-C	MW-3	Water/BTEX		
		Benzene	*	0.5 ppb
		Toluene	*	0.5 ppb
		Ethylbenzene	*	0.5 ppb
		Xylenes	*	0.5 ppb

* No detectable amount @ detection limit

Analyst Signature R. M. Lamoy

CHAIN OF CUSTODY RECORD

PROJECT NO/MW: Alam Fire #2

SITE NAME & ADDRESS: Alam Fire Dept / 635 Pacific St Alameda, Ca

WITNESSING AGENCY / INSPECTOR NAME / DATE: Juliet Shen / Alam Health Dept

ID.NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION	TPH (Gasoline) & B, T, X, & E	TPH (Diesel) & [illegible]	Total Oil & Grease	Halogenated HC's	B, T, X & E	Heavy Metals		REMARKS
MW-2	9/4/92			X		✓	✓						
MW-4	9/4/92			X		✓	✓						
MW-3	9/4/92			X		✓	✓						

ANALYSES REQUESTED (1)

(1) See attached "Table 2" for specific analysis method.

Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Helen Mavrakissian	9/5/92 1:16	
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Received by: (Signature)
Relinquished by: (Signature)	Date/Time	Rec'd for Laboratory by: (Signature)
	9/5/92 1:45	R Henson

The following MUST BE completed by the laboratory accepting samples for analysis:

1. Have all samples received for analysis been stored in ice? Yes
2. Will samples remain refrigerated until analyzed? Yes
3. Did any samples received for analysis have head space? No
4. Were samples in appropriate containers and properly packaged? Yes

R Henson — Signature — Title — 9-5-92 Date

Rev: 12-88