Environmental Bio-Systems
30028 Industrial Parkway, Southwest
Hayward, California 94544-6904
(415) 429-9988

October 10, 1989

Gary Zaccor
Zaccor Corporation
791 Hamilton Avenue
Menlo Park, California 94025

Mr. Zaccor:

The following documentation concerns the additional excavation sampling and assessment performed by Environmental Bio-Systems, for Zaccor Corporation, on September 11, 1989 at:

LEWIS BAY SERVICE STATION
1127 LINCOLN AVENUE
ALAMEDA, CALIFORNIA

On this date, following removal and sampling of 5 underground storage tanks, Environmental Bio-Systems, Inc. returned to the site to collect samples confirming the results of additional soil removal. in areas of the tank pits found to be of concern during on site analysis of soil interface samples collected during tank removal. Mr. Lawrence Seto of the Alameda County Department of Environmental Health was present to approve sampling locations and protocols.

SAMPLING

Due to the close proximity of buildings and streets to the pits, coupled with the sandy composition of the surrounding soils, vertical excavation was not possible to any great extent. See the site diagram included with this report for corresponding sample locations.

Soil sample #10 was collected from the west side of the tank B depression at a depth below grade of 10.0 feet. Analyses included TPH (total petroleum hydrocarbons) as gasoline and BTEX (benzene, toluene, ethylbenzene, and xylenes).

Soil sample #11 was collected from the north end of the tank C depression at a depth below grade of 12.0 feet. Analyses included TPH as gasoline and BTEX.

Soil sample #12 was collected from the east side of the tank C depression at a depth below grade of 11.0 feet. Analyses included TPH as gasoline and BTEX.

Soil sample #13 was collected from the south side of the tank B&C depression, in between the tank locations, at a depth below grade of 11.0 feet. Analyses included TPH as gasoline and BTEX.

Soil sample #14A-D was collected to be analyzed as a composite from approximately 1/2 of stockpile II (east side of pile). Soil from this pile was removed from the tank B&C excavation. Analyses included TPH as gasoline and BTEX.

Soil sample #15A-D was collected to be analyzed as a composite from approximately 1/2 of stockpile II (west side of pile). Soil from this pile was removed from the tank B&C excavation. Analyses included TPH as gasoline and BTEX.

Soil sample #16A-D was collected to be analyzed as a composite from stockpile III. Soil from this pile was removed from the tank D&E excavation. Analyses included TPH as gasoline and BTEX.

Analytical methods used were consistent with current guidelines set forth by the San Francisco Regional Water Quality Control Board (SFRWQCB).

SAMPLING METHODOLOGY

Soil was removed from the pit in a backhoe bucket. After removing the first 3 to 4 inches of soil, presumably slough, samples were contained by driving clean brass tubes (1.92" x 6") into the exposed layer just above the teeth of the bucket. Soil was packed into the tubes to exclude the existence of headspace. Thus prepared, the ends of the tubes were wrapped with aluminum foil and sealed with plastic caps. After removing excess foil, electrical tape was applied to the seems between cap and tube in an effort to reduce evaporative loss of volatile constituents.

Soil samples taken from a hand auger were promptly packed into clean brass tubes (1.92" x 6"). The exposed ends of the tubes are covered with aluminum foil beneath snug fitting plastic caps. The seams between cap and tube were covered with a non-contributing plastic tape in an effort to reduce evaporative loss of volatile compounds.

The samples were documented on an appropriate chain of custody, placed on ice and transported to Mobile Chem Labs Inc., a certified hazardous waste analytical laboratory for analyses.

RESULTS

Copies of the sample analytical results are enclosed.

Soil sample #10 was found to contain 670 ppm (parts per million) TPH as gasoline, as well as 2.9 ppm benzene, 8.3 ppm toluene, 22 ppm ethylbenzene, 110 ppm xylenes.

Soil sample #11 was found to contain 3.7 ppm TPH as gasoline, as well as .1 ppm toluene, .1 ppm ethylbenzene, .5 ppm xylenes.

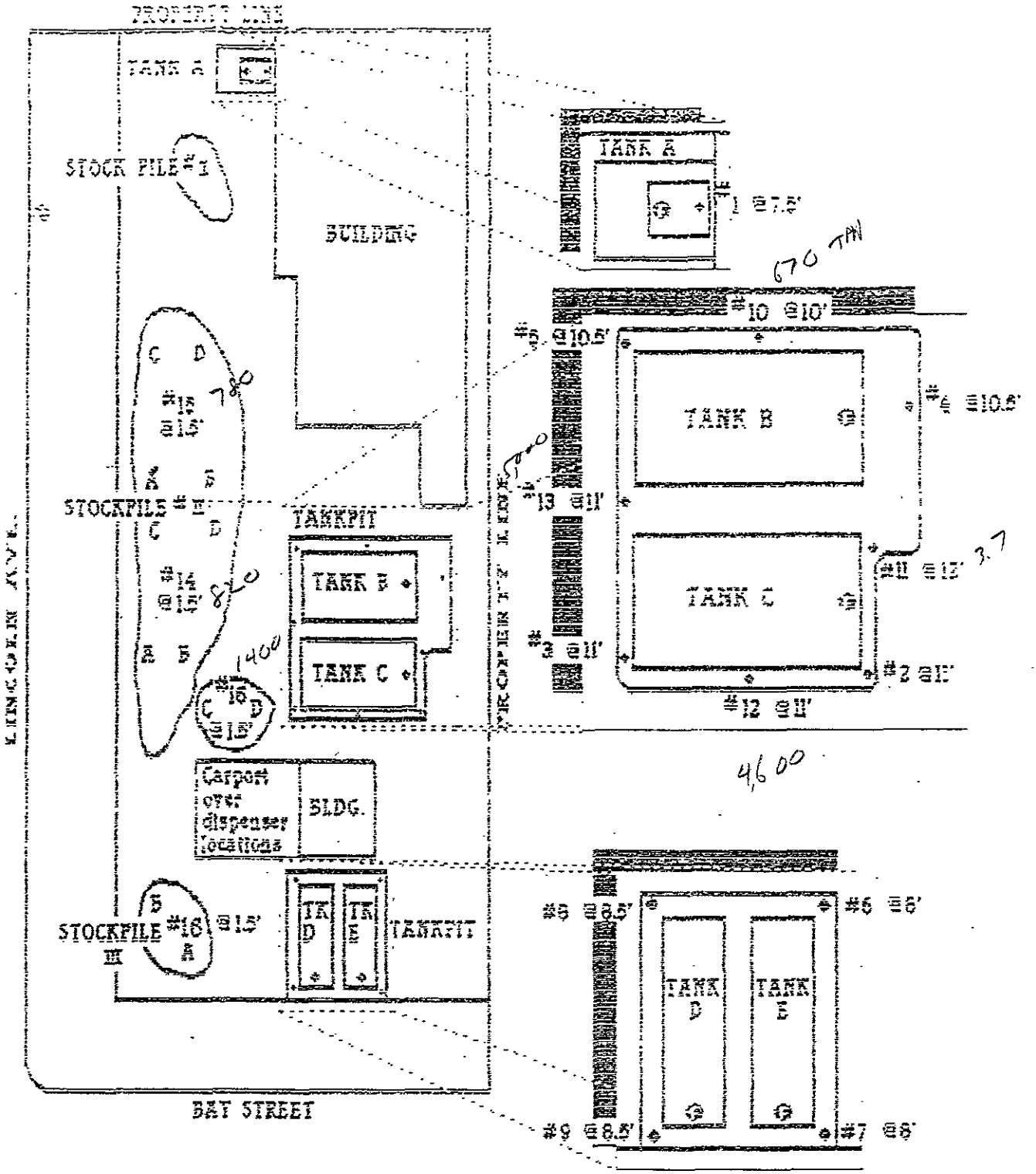
Soil sample #12 was found to contain 4,600 ppm TPH as gasoline, as well as 42 ppm benzene, 220 ppm toluene, 160 ppm ethylbenzene, 350 ppm xylenes.

Soil sample #13 was found to contain 5,000 ppm TPH as gasoline, as well as 21 ppm benzene, 200 ppm toluene, 150 ppm ethylbenzene, 380 ppm xylenes.

Soil sample #14A-D was found to contain 820 ppm TPH as gasoline, as well as 6.1 ppm benzene, 26 ppm toluene, 31 ppm ethylbenzene, 110 ppm xylenes.

Soil sample #15A-D was found to contain 780 ppm TPH as gasoline, as well as 18 ppm benzene, 64 ppm toluene, 27 ppm ethylbenzene, 120 ppm xylenes.

Soil sample #16A-D was found to contain 1,400 ppm TPH as gasoline, as well as 0.9 ppm benzene, 44 ppm toluene, 36 ppm ethylbenzene, 220 ppm xylenes.



ZACCOR @
LEWIS BAY SERVICE STATION
1127 LINCOLN AVE.
ALAMEDA, CA.

0' 5' 10' 15'

0' 10' 20' 30'

RECOMMENDATIONS

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 in dealing with tank removal and associated contamination.

To remain in compliance with SFRWQCB guidelines, we recommend the following: the installation of at least one groundwater monitoring wells placed within ten feet of the previous locations of each of the three tank pits in verified downgradient positions, as approved by the appropriate regulatory agency assigned to oversee work done at this location. Subsequent sampling of the groundwater and measurement of depth to groundwater should be carried out quarterly for at least one hydrologic cycle (one year) to determine any impact on shallow water quality as effected by varying groundwater levels.

The presence of soil contamination greater than 100 ppm mandates remedial action. Further examination into the extent of soil contamination in excess of the maximum allowable limits is necessary to determine the volume and area involved.

In order to address the active status of the site as a business, future soil assessment should be directed toward developing an in-situ remedial plan. Before this can be accomplished, the area of impact must be established.

Soil vapor extraction appears to be a viable alternative given the nature of the contamination and the porosity of the surrounding soils. Using this methodology involves the installation of "dry wells" screened within the contaminated soil zone. A vacuum is applied to the wells to extract the vapor from the soil. This technology is most appropriate in cases of significantly volatile hydrocarbon contamination where excavation is impossible or unattractive.

A protocol combining the installation of monitoring wells with both soil borings and dry wells could be implemented, reducing the costs of operation. Such a protocol would involve the use of a certified mobile laboratory to give immediate soil analysis during drilling.

With an average concentration of 1,000 ppm TPH as gasoline, the stockpiled soils may be aerated at a rate of 30 cubic yards per day, with approval by the BAAQMD (Bay Area Air Quality Management District) in conjunction with regulation 8, rule 40.

REPORTAGE

Copies of the sampling report, the chain of custody, and the certified analytical data sheets should be submitted to both the SFRWQCB fuel leaks division and the Alameda County Department of Health.

If you have any questions, or if I may be of further service please contact me at (415) 429-9988.

Sincerely,
ENVIRONMENTAL BIO-SYSTEMS

Timothy M. Babcock
Project Manager

TMB/ss

MOBILE CHEM LABS INC.

1678 Reliez Valley Road
Lafayette, CA 94549 • (415) 945-1266

Environmental Bio-Systems
30028 Industrial Pkwy. S.W.
Hayward, CA 94544-6904
Attn: Timothy Babcock
Environmental Scientist

Date Sampled:09-11-89
Date Received:09-11-89
Date Reported:09-19-89

Sample Number	Sample Description
099113	Job #003-066-254 - Alemeda 1127 Lincoln Ave. # 10 SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	670
Benzene	0.1	2.9
Toluene	0.1	8.3
Xylenes	0.1	110
Ethylbenzene	0.1	22

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.

MOBILE CHEM LABS

Ronald G. Evans
Lab Director

MOBILE CHEM LABS INC.

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30028 Industrial Pkwy. S.W.
Hayward, CA 94544-6904
Attn: Timothy Babcock
Environmental Scientist

Date Sampled: 09-11-89
Date Received: 09-11-89
Date Reported: 09-19-89

Sample Number	Sample Description
099114	Job #003-066-254 - Alemeda 1127 Lincoln Ave. # 11 SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	3.7
Benzene	0.1	<0.1
Toluene	0.1	0.1
Xylenes	0.1	0.5
Ethylbenzene	0.1	0.1

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.

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Attn: Timothy Babcock
Environmental Scientist

Date Sampled:09-11-89
Date Received:09-11-89
Date Reported:09-19-89

Sample Number	Sample Description
099115	Job #003-066-254 - Alemeda 1127 Lincoln Ave. # 12 SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	4,600
Benzene	0.1	42
Toluene	0.1	220
Xylenes	0.1	350
Ethylbenzene	0.1	160

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.

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Attn: Timothy Babcock
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Date Sampled:09-11-89
Date Received:09-11-89
Date Reported:09-19-89

Sample Number	Sample Description
099116	Job #003-066-254 - Alemeda 1127 Lincoln Ave. # 13 SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	5,000
Benzene	0.1	21
Toluene	0.1	200
Xylenes	0.1	380
Ethylbenzene	0.1	150

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.

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Attn: Timothy Babcock
Environmental Scientist

Date Sampled:09-11-89
Date Received:09-11-89
Date Reported:09-19-89

Sample Number	Sample Description
099071	Job #003-066-254 - Alemeda 1127 Lincoln Ave. # 14 A-D SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	820
Benzene	0.1	6.1
Toluene	0.1	26
Xylenes	0.1	110
Ethylbenzene	0.1	31

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.

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Hayward, CA 94544-6904
Attn: Timothy Babcock
Environmental Scientist

Date Sampled:09-11-89
Date Received:09-11-89
Date Reported:09-19-89

Sample Number	Sample Description
099072	Job #003-066-254 - Alemeda 1127 Lincoln Ave. # 15 A-D SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	780
Benzene	0.1	18
Toluene	0.1	64
Xylenes	0.1	120
Ethylbenzene	0.1	27

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.

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Hayward, CA 94544-6904
Attn: Timothy Babcock
Environmental Scientist

Date Sampled:09-11-89
Date Received:09-11-89
Date Reported:09-19-89

Sample Number	Sample Description
099073	Job #003-066-254 - Alemeda 1127 Lincoln Ave. # 16 A-D SOIL

ANALYSIS

	Detection Limit	Sample Results
	ppm	ppm
Total Petroleum Hydrocarbons as Gasoline	1.0	1,400
Benzene	0.1	0.9
Toluene	0.1	44
Xylenes	0.1	220
Ethylbenzene	0.1	36

Note: Analysis was performed using EPA methods 5030 and TPH LUFT with method 8020 used for BTX distinction.

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Lab Director

ENVIRONMENTAL BIO-SYSTEMS
30028 INDUSTRIAL PKWY., S.W.
HAYWARD, CA. 94544
(415) 429-9988

CHAIN OF CUSTODY DOCUMENTATION

Site Address: Zaccor & Lewis Bay str. Service 1127 Lincoln Ave Alameda Cal
Job #: 003-066-254

Turn Around: On-Site 2wks per Gary Zaccor

Lab Used: Mobile Chem (on Site)

Sampler: Harry Hall Date Sampled: 9-11-89

Sample:	Soil/ Water:	Analyses:	Single/ COMP.:	
#10	S	TPH(gas) BTX&E	S	1163
#11	S		S	1164
#12	S		S	1165
#13	S		S	1166
090071 14A-D	S		C	
090072 15A-D	S		C	

Released By:	Accepted By:	Date/Time
Harry Hall	Charles F. Morrow	5:05 9/11/89
		: / /
		: / /

Signed: _____

ENVIRONMENTAL BIO-SYSTEMS
30028 INDUSTRIAL PKWY., S.W.
HAYWARD, CA. 94544
(415) 429-9288

CHAIN OF CUSTODY DOCUMENTATION

Site Address: Zaccor @ Lewis Bay Str. Station 1123 Lincoln Ave Alameda Calif
Job #: 003-066-254

Turn Around: On Site 2wks per Gary Zaccor

Lab Used: Mobile Chem (on site)

Sampler: Harry Hall Date Sampled: 9-11-89

	Sample:	Soil/ Water:	Analyses:	Single/ COMP.:
099073	16A-D	S	TPH (gas) BTX; E	C

Released By:	Accepted By:	Date/Time
Harry Hall		6:15 9/11/89
		: / /
		: / /

Signed: _____