A·C·C
ENVIRONMENTAL
CONSULTANTS

October 23, 1996

Mr. Steve Chrissanthos
Alameda Cellars
1709 Otis Drive
Alameda, CA 94501

RE: Biannual Groundwater Monitoring
901 Lincoln Avenue, Alameda, California
ACC Project No. 94-6039-1.5

Dear Mr. Chrissanthos:

Enclosed please find the report for the biannual groundwater monitoring for the groundwater monitoring wells associated with the ongoing subsurface investigation at the above referenced property. This work was performed in accordance with requests from Ms. Juliet Shin of the Alameda County Health Care Services Agency to document that the residual contaminants impacting the groundwater are attenuating and do not pose a human health risk.

The results of the groundwater analysis indicated no detectable concentrations of constituents in monitoring well MW-4. Sample analytical results from monitoring well MW-1 indicated detectable levels of total petroleum hydrocarbons as gasoline, benzene, toluene, and ethylbenzene.

If you have any comments regarding this report, please call me at (510) 638-8400.

Sincerely,

Misty Kaltreider

Misty C. Kaltreider MCK
Project Geologist

cc: Ms. Juliet Shin, Alameda County Health Care Services Agency

A·C·C
ENVIRONMENTAL
CONSULTANTS

BIANNUAL GROUNDWATER MONITORING REPORT

October 23, 1996

901 Lincoln Avenue
Alameda, California

Prepared For:
Mr. Steve Chrissanthos
Alameda Cellars

ACC Project No. 95-6039-1.6

OAKLAND ▪ SACRAMENTO
SEATTLE ▪ LOS ANGELES

A·C·C
ENVIRONMENTAL
CONSULTANTS

BIANNUAL GROUNDWATER MONITORING REPORT
901 Lincoln Avenue
Alameda, California

ACC Project No. 94-6039-1.5

Prepared for:

Mr. Steve Chrissanthos
Alameda Cellars
1709 Otis Drive
Alameda, California 94501

October 23, 1996

Prepared by: Misty Kaltreider
Misty Kaltreider
Project Geologist

Reviewed by: David R. DeMent
David R. DeMent
Registered Geologist

REGISTERED GEOLOGIST
DAVID R. DEMENT
NO. 5874
STATE OF CALIFORNIA

7977 Capwell Drive, Suite 100 • Oakland, CA 94621 • (510) 638-8400 • FAX· (510) 638-8404
OAKLAND • LOS ANGELES • SACRAMENTO • SEATTLE

A·C·C ENVIRONMENTAL CONSULTANTS

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

A·C·C ENVIRONMENTAL CONSULTANTS

BIANNUAL GROUNDWATER MONITORING REPORT
901 Lincoln Avenue
Alameda, California

1.0 INTRODUCTION

On behalf of Mr. Steve Chrissanthos and Alameda Cellars, ACC Environmental Consultants, Inc., (ACC) has prepared this report on biannual groundwater monitoring performed at 901 Lincoln Avenue, Alameda, California (Figure 1). The purpose of the work was to evaluate changes in the groundwater direction and gradient, monitor the extent of petroleum hydrocarbons in the groundwater by obtaining samples from the existing monitoring wells, and evaluate groundwater quality by evaluating biodegradation indicators.

2.0 BACKGROUND

In March 1990, two 10,000-gallon gasoline tanks and one 2,000-gallon diesel tank were removed from the site. Analysis of the soil samples collected from beneath the two gasoline tanks indicated concentrations up to 710 parts per million (ppm) of total petroleum hydrocarbons as gasoline (TPHg). Soil samples collected from beneath the diesel tank indicated nondetectable concentrations of total petroleum hydrocarbons as diesel.

According to a request from the Alameda County Health Care Services Agency, Hazardous Materials Division (ACHCSA), a Preliminary Site Assessment was conducted to further evaluate soil impact from the gasoline release on site. ACC was retained by Mr. Chrissanthos to perform the work requested by the ACHCSA.

On December 4, 1992, three monitoring wells were installed on site. Analytical results of soil samples collected during drilling boring MW-1 indicated concentrations of 56 ppm of TPHg and concentrations of benzene, toluene, ethylbenzene, and total xylenes (BTEX). Monitoring well MW-1 is located adjacent to the former tank excavation. Soil samples collected from the other borings indicated constituents of concern were not above reporting limits.

Initial groundwater samples collected from the onsite monitoring wells on December 15, 1992, indicated below detectable levels of constituents. On February 24, 1993, ACC performed a soil investigation at the property to evaluate the lateral and vertical extents of soil impact adjacent to monitoring well MW-1. Analytical results of soil samples collected indicated below detectable levels of petroleum hydrocarbon constituents in the soil. It was concluded that petroleum hydrocarbon impact on site is limited to soil around monitoring well MW-1.

In October 1993, monitoring well MW-4 was installed downgradient of monitoring well MW-1 on site (Figure 2). Laboratory analysis of soil samples collected during drilling indicated below detectable levels of constituents. In November 1993, laboratory analysis of groundwater samples collected from the onsite monitoring wells indicated below detectable levels of constituents in monitoring wells MW-2, MW-3, and MW-4.

In December 1993, ACHCSA approved a reduction in groundwater sampling. The revised groundwater sampling and monitoring program included performing monitoring of all four wells on site and collecting groundwater samples from only monitoring wells MW-1 and MW-4 on a biannual basis. Groundwater samples collected from these wells should be analyzed for TPHg and BTEX.

In 1995, site closure with no further monitoring was requested based on the continual degrading of dissolved petroleum hydrocarbon concentrations in monitoring well MW-1 and degrading concentrations since 1993. The request for closure was denied by the ACHCSA in a letter dated December 11, 1995, due to the elevated concentrations of benzene reported in monitoring well MW-1 in August 1995. The ACHCSA requested continued biannual monitoring. ACHCSA requested that the groundwater samples be analyzed for dissolved oxygen (DO), nitrate, sulfate, ferrous and ferric iron, and total dissolved solids (TDS) in its letter dated May 17, 1996, to evaluate whether natural bioremediation is occurring. This report documents the water quality at the site.

3.0 GROUNDWATER MONITORING AND SAMPLING

ACC conducted biannual groundwater monitoring on September 6, 1996. Work at the site included measuring depth to water, subjectively evaluating groundwater in the wells, and purging and sampling the wells in preparation for laboratory analysis.

3.1 Groundwater Monitoring

Prior to groundwater monitoring, the depth to the surface of the water table was measured from the top of the polyvinyl chloride casing in each on site monitoring well using a Solinst water level meter. Information regarding depths of wells, well elevations and groundwater levels is summarized in Table 1.

TABLE 1 - GROUNDWATER DEPTH INFORMATION

Well No. Well Elevation	Sample Date	Depth to Groundwater (feet)	Groundwater Elevation (MSL)
MW-1	12/15/92	10.27	8.72
18.99	01/06/93	8.67	10.32
	02/09/93	6.67	12.01
	03/20/93	6.94	12.05
	04/08/93	7.25	11.74
	05/17/93	8.67	10.32
	06/23/93	9.58	9.41
	07/13/93	10.21	8.78
	08/10/93	10.78	8.21
	09/10/93	11.21	7.78
	10/25/93	11.58	7.41
	11/12/93	11.74	7.25
	02/16/94	8.94	10.05
	03/10/94	8.71	10.32
	05/16/94	9.76	9.23
	08/29/94	11.28	7.71
	02/15/95	6.76	12.23
	08/28/95	10.03	8.96
	02/23/96	6.81	12.18
	09/06/96	10.70	8.29
MW-2	12/15/92	10.14	8.89
19.03	01/06/93	8.50	10.53
	02/09/93	6.66	12.37
	03/20/93	6.53	12.50
	04/08/93	6.83	12.20
	05/17/93	8.34	10.69
	06/23/93	9.36	9.67
	07/13/93	9.99	9.04
	08/10/93	10.54	8.49
	09/10/93	11.08	7.95
	10/25/93	11.41	7.62
	11/12/93	11.58	7.45
	02/16/94	8.71	10.32
	03/10/94	7.93	11.10
	05/16/94	9.58	9.45
	08/29/94	11.16	7.87
	02/15/95	6.32	12.71
	08/28/95	9.75	9.28
	02/23/96	6.37	12.66
	09/06/96	10.53	8.50

Well No. Well Elevation	Sample Date	Depth to Groundwater (feet)	Groundwater Elevation (MSL)
MW-3 19.35	12/15/92	10.44	8.91
	01/06/93	8.91	10.44
	02/09/93	7.26	12.09
	03/20/93	7.16	12.19
	04/08/93	7.49	11.86
	05/17/93	9.01	10.34
	06/23/93	10.22	9.13
	07/13/93	10.58	8.77
	08/10/93	11.12	8.23
	09/10/93	11.68	7.67
	10/25/93	11.98	7.37
	11/12/93	12.12	7.23
	02/16/94	9.18	10.17
	03/10/94	8.32	10.83
	05/16/94	10.28	9.07
	08/29/94	11.77	7.58
	02/15/95	6.87	12.50
	08/28/95	10.27	9.08
	02/23/96	6.93	12.42
	09/06/96	11.14	8.21
MW-4 18.51	08/23/93	10.27	9.08
	10/25/93	11.43	7.08
	11/12/93	11.59	6.92
	02/16/94	7.80	10.71
	03/10/94	8.36	10.15
	05/16/94	9.66	8.85
	08/29/94	11.11	7.40
	02/15/95	6.75	11.76
	08/28/95	9.95	8.56
	02/23/96	6.75	11.76
	09/06/96	10.57	7.94

Notes: All measurements in feet
MSL = Mean sea level

In addition, groundwater monitoring was performed before, during, and after purging to evaluate the groundwater for intrinsic parameters of biodegradation. Monitoring included measuring for temperature and DO with the use of a Horiba® U-10 meter and continuous flow cell and conductivity and pH with the use of a Hydac® meter. In addition, samples were collected for analysis of nitrate, sulfate, total iron, soluble iron, and TDS. The parameter results are summarized in Table 2. Only wells MW-1, MW-2, and MW-4 were measured. Well MW-3 has historically been clean, and was not monitored for this study.

TABLE 2 - MONITORING PARAMETERS

Well No.- Gallons Removed	pH	Temp (°C)	Conductivity (µn/cm)	DO (mg/L)	Nitrate (mg/L)	Sulfate (mg/L)	Total Iron (mg/L)	Soluble Iron (mg/L)	TDS (mg/L)
MW-1 - 0	6.36	23.3	0.750	1.57	---	---	---	---	---
1	6.38	22.7	0.750	1.87	---	---	---	---	---
1.5	6.40	22.5	0.762	1.87	---	---	---	---	---
2.5	6.38	22.2	0.761	1.84	<0.05	13	14	0.22	430
MW-2- 0	6.40	24.0	0.254	---	---	---	---	---	---
1.8	6.33	23.2	0.263	---	---	---	---	---	---
2.7	6.31	23.1	0.257	---	---	---	---	---	---
4.5	6.36	22.9	0.248	---	4.7	25	15	0.19	140
MW-4 - 0	7.22	21.6	0.818	1.87	---	---	---	---	---
2.8	6.55	20.7	0.831	1.83	---	---	---	---	---
4.2	6.52	20.5	0.805	1.68	---	---	---	---	---
5.6	6.48	20.4	0.801	1.73	~~<0.05~~ 1.1	26	94	0.15	390

Notes: mg/L = milligrams per liter, equivalent to parts per million

3.2 Groundwater Gradient

Groundwater levels were measured from the four existing monitoring wells on September 6, 1996, and were used to calculate groundwater elevation (Figure 3). The gradient was evaluated by triangulation using the elevation of the potentiometric surface measured with respect to MSL data. Based on groundwater elevation calculations, groundwater flow direction is toward the northwest at an average gradient of 0.006 foot/foot. The groundwater flow direction is consistent with previous sampling events since 1993. Table 3 summarizes the current and historic groundwater gradient and direction of groundwater flow on site.

TABLE 3 - HISTORICAL GROUNDWATER GRADIENT

Date Monitored	Gradient (foot/foot)	Direction
12/15/92	0.002	west-southwest
01/06/93	0.004	northwest
02/09/93	0.008	northwest
03/10/93	0.009	northwest
04/08/93	0.011	northwest
05/17/93	0.008	northwest
06/23/93	0.008	north-northwest
07/13/93	0.006	northwest
08/10/93	0.006	northwest
09/10/93	0.006	northwest
10/25/93	0.007	northwest

Date Monitored	Gradient (foot/foot)	Direction
11/12/93	0.006	northwest
02/16/94	0.01	northwest
03/10/94	0.01	northwest
05/16/94	0.016	northwest
08/29/94	0.006	northwest
02/15/95	0.009	northwest
08/23/95	0.008	northwest
02/23/96	0.009	northwest
09/06/96	0.006	northwest

3.3 Groundwater Sampling

During sampling, after water level measurements were taken, monitoring wells MW-1, MW-2, and MW-4 were purged by hand using a designated, disposable polyethylene bailer for each well. Groundwater pH, temperature, and electrical conductivity were monitored during well purging. Each well was considered to be purged when these parameters stabilized. Four well volumes were removed to purge each well. In addition, wells MW-1 and MW-4 were monitored for DO, salinity, and turbidity. Worksheets of groundwater conditions monitored during purging are attached in Appendix 1.

Groundwater samples were collected from monitoring wells MW-1, MW-2, and MW-4 on September 6, 1996. After the groundwater had recovered to a minimum of approximately 80 percent of its static level, water samples were obtained using a designated disposable polyethylene bailer attached to new string. From each monitoring well, approved, laboratory-supplied sample vials were filled to overflowing and sealed so that no air was trapped in the vial. In addition, samples intended for soluble iron analysis were filtered through a 0.45 micron filter for collection. Once filled, sample vials were inverted and tapped to test for air bubbles. Sample containers were labeled with self-adhesive, preprinted tags and were stored in a pre-chilled, insulated container pending delivery to a state-certified laboratory for analysis.

Water purged during the development and sampling of the monitoring wells was stored temporarily on site in Department of Transportation approved 55-gallon drums pending laboratory analysis and proper disposal.

4.0 RESULTS OF GROUNDWATER MONITORING

Groundwater samples collected from each well were submitted to Chromalab, Inc., following chain of custody protocol. Groundwater samples collected from wells MW-1 and MW-4 were analyzed for TPHg and BTEX by EPA Method 8015M/8020. Samples collected from wells MW-1, MW-2, and MW-4 were analyzed for nitrate and sulfate by EPA Method 300.0, total and soluble iron by EPA Method 3010A/6010A, and TDS by EPA Method 160.1. Copies of the chain of custody record and laboratory analytical reports are included in Appendix 2. Laboratory analytical results are summarized in Table 3.

TABLE 4 - GROUNDWATER SAMPLE ANALYTICAL RESULTS

Well No.	Date Sampled	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW-1	12/15/92	<50	<0.5	<0.5	<0.5	<0.5
	03/10/93	100	0.86	<0.5	<0.5	6.3
	06/23/93	6,800	2,500	1,100	100	560
	09/10/93	15,000	4.400	620	850	630
	10/25/93	----	----	----	----	----
	11/12/93	5,400	1,900	1.1	700	20
	02/16/94	69	1.5	<0.5	<0.5	3.1
	03/10/94	----	----	----	----	----
	05/16/94	520	14	1.1	9.0	8.9
	08/29/94	500	12	1.3	2.2	4.6
	02/15/95	80	1.9	<0.5	<0.5	3.6
	08/28/95	2,400	650	7.4	68	19
	02/23/96	100	7.4	<0.5	<0.5	4.3
	09/06/96	980	7.2	1.1	47	~~<0.5~~ 5
MW-2	12/15/92	<50	<0.5	<0.5	<0.5	<0.5
	03/10/93	<50	<0.5	<0.5	<0.5	<0.5
	06/23/93	<50	<0.5	<0.5	<0.5	<0.5
	09/10/93	<50	<0.5	<0.5	<0.5	<0.5
	10/25/93	----	----	----	----	----
	11/12/93	<50	<0.5	<0.5	<0.5	<0.5
	02/16/94	----	----	----	----	----
	03/10/94	----	----	----	----	----
	05/16/94	----	----	----	----	----
	08/29/94	----	----	----	----	----
	02/15/95	----	----	----	----	----
	08/28/95	----	----	----	----	----
	02/23/96	----	----	----	----	----
	09/06/96	----	----	----	----	----

Well No.	Date Sampled	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Total Xylenes (µg/L)
MW-3	12/15/92	<50	<0.5	<0.5	<0.5	<0.5
	03/10/93	<50	<0.5	<0.5	<0.5	<0.5
	06/23/93	<50	<0.5	<0.5	<0.5	<0.5
	09/10/93	<50	<0.5	<0.5	<0.5	<0.5
	10/25/93	----	----	----	----	----
	11/12/93	<50	<0.5	<0.5	<0.5	<0.5
	02/16/94	----	----	----	----	----
	03/10/94	----	----	----	----	----
	05/16/94	----	----	----	----	----
	08/29/94	----	----	----	----	----
	02/15/95	----	----	----	----	----
	08/28/95	----	----	----	----	----
	02/23/96	----	----	----	----	----
	09/06/96	----	----	----	----	----
MW-4	10/25/93	<50	<0.5	<0.5	<0.5	<0.5
	11/12/93	<50	<0.5	<0.5	<0.5	<0.5
	02/16/94	<50	<0.5	<0.5	<0.5	<0.5
	03/10/94	<50	<0.5	<0.5	<0.5	<0.5
	05/16/94	<50	<0.5	<0.5	<0.5	<0.5
	08/29/94	<50	<0.5	<0.5	<0.5	<0.5
	02/15/95	<50	<0.5	<0.5	<0.5	<0.5
	08/28/95	<50	<0.5	<0.5	<0.5	<0.5
	02/23/96	<50	<0.5	<0.5	<0.5	<0.5
	09/06/96	<50	<0.5	<0.5	<0.5	<0.5

Notes: µg/L = micrograms per liter (ppb)

5.0 DISCUSSION

Laboratory analysis of groundwater samples collected from monitoring well MW-1 indicated detectable concentrations of TPHg, benzene, toluene, and ethylbenzene. No concentrations above reporting limits were detected in the groundwater sample collected from monitoring well MW-4, indicating a downgradient extent of petroleum hydrocarbons. Concentrations of TPHg reported in monitoring well MW-1 rose with respect to TPHg concentrations detected in April 1996. This possibly indicates that remnant impact in soil is deeper than groundwater (the tank bottom was between 10 and 12 feet below ground surface [bgs]); therefore, when groundwater is deeper (i.e., between 10 and 12 feet bgs) constituents migrate through the groundwater whereas at higher levels, more groundwater is present and more dilution is occurring.

5.1 Dissolved Oxygen

DO concentrations can be used to evaluate the mass of constituents that can be biodegraded by aerobic processes. During aerobic biodegradation, DO levels are reduced, and aerobic biodegradation can degrade BTEX components if sufficient DO (>1 to 2 mg/L) is present (Buscheck and O'Reilly, March 1995). Levels of DO were consistent throughout the site ranging from 1.57 to 1.87 mg/L in wells MW-1 and MW-4. This indicates that sufficient DO is present in the groundwater and aerobic degradation of the petroleum hydrocarbons is occurring.

↑But DO levels in uncontaminated wells were same level as contaminated wells.

5.2 pH

The pH of groundwater affects the presence and activity of microbes. Microbes capable of degrading petroleum hydrocarbons prefer pH values varying from 6 to 8. A difference in pH between the impacted groundwater and uncontaminated groundwater indicates biological activity (Buscheck and O'Reilly, March 1995). Values for pH were reported to be very slightly acidic but well within levels conducive to microbial growth.

5.3 Nitrate

After DO has been depleted in the groundwater, nitrate and sulfate can be used as electron acceptors for anaerobic biodegradation in processes known as denitrification and sulfanogenesis (Buscheck and O'Reilly, March 1995). No nitrate was reported in wells MW-1 and MW-4 and an elevated concentration was detected in well MW-2, indicating elevated natural conditions; therefore, it appears that the microbes are using nitrate as the primary source of electrons.

5.4 Sulfate

wrong. Levels of sulfates were lower in MW-1 than in other wells indicating anaerobic degradation.

The reported sulfate concentration in the groundwater collected from impacted well (MW-1) was slightly higher than that in the groundwater collected from non-impacted wells (MW-4 and MW-2). This indicates that sulfate is being used by microbes at a slower rate than nitrate. The lower concentration of sulfate in well MW-1 indicates higher natural conditions (e.g., in wells MW-2 and MW-4).

5.5 Iron

Total iron (ferric iron) in the groundwater can be used as an electron acceptor, which aids biodegradation of petroleum hydrocarbons in aerobic conditions (Buscheck and O'Reilly, March 1995). In this process, ferric iron is reduced to ferrous iron, which is soluble in water. The presence of ferrous iron in the groundwater is an indicator of anaerobic degradation of petroleum hydrocarbons. Minor detectable concentrations of ferrous iron were reported in the groundwater collected from impacted well MW-1 and non-impacted well MW-4. This further indicates natural anaerobic biodegradation.

6.0 CONCLUSIONS AND RECOMMENDATIONS

The concentrations of TPHg and BTEX detected within samples collected from monitoring well MW-1 have decreased significantly since August 1995. Due to the natural soil makeup of this site, migration of petroleum hydrocarbons is unlikely. Based on experience with similar site conditions, with minor petroleum hydrocarbon residues in soil overlying a shallow, poor quality aquifer, ACC believes the petroleum hydrocarbon concentrations will continue to degrade with time. ACC believes that continued monitoring is not warranted based on the following conclusions:

- The findings from the groundwater monitoring and analysis indicate that natural biodegradation is occurring within the impacted groundwater plume. DO concentrations indicate that aerobic biodegradation can occur at the site but microbes appear to be using nitrate as the main source of biodegradation catalyst. However, the relatively low naturally occurring concentrations of sulfate and iron in the groundwater could suppress aerobic biodegradation; therefore, the petroleum hydrocarbons in the groundwater also appear to be degrading by anaerobic means. This indicates that natural biodegradation is occurring both aerobically and anaerobically within the groundwater at the site.

- Because of the relatively slow rate of anaerobic biodegradation, petroleum hydrocarbon concentrations in the groundwater will continue to illustrate fluctuations as a result of fluctuating water levels, but the overall concentrations will decrease with time. This slow decrease has been illustrated in the groundwater sampling and analysis performed at the site since 1993.

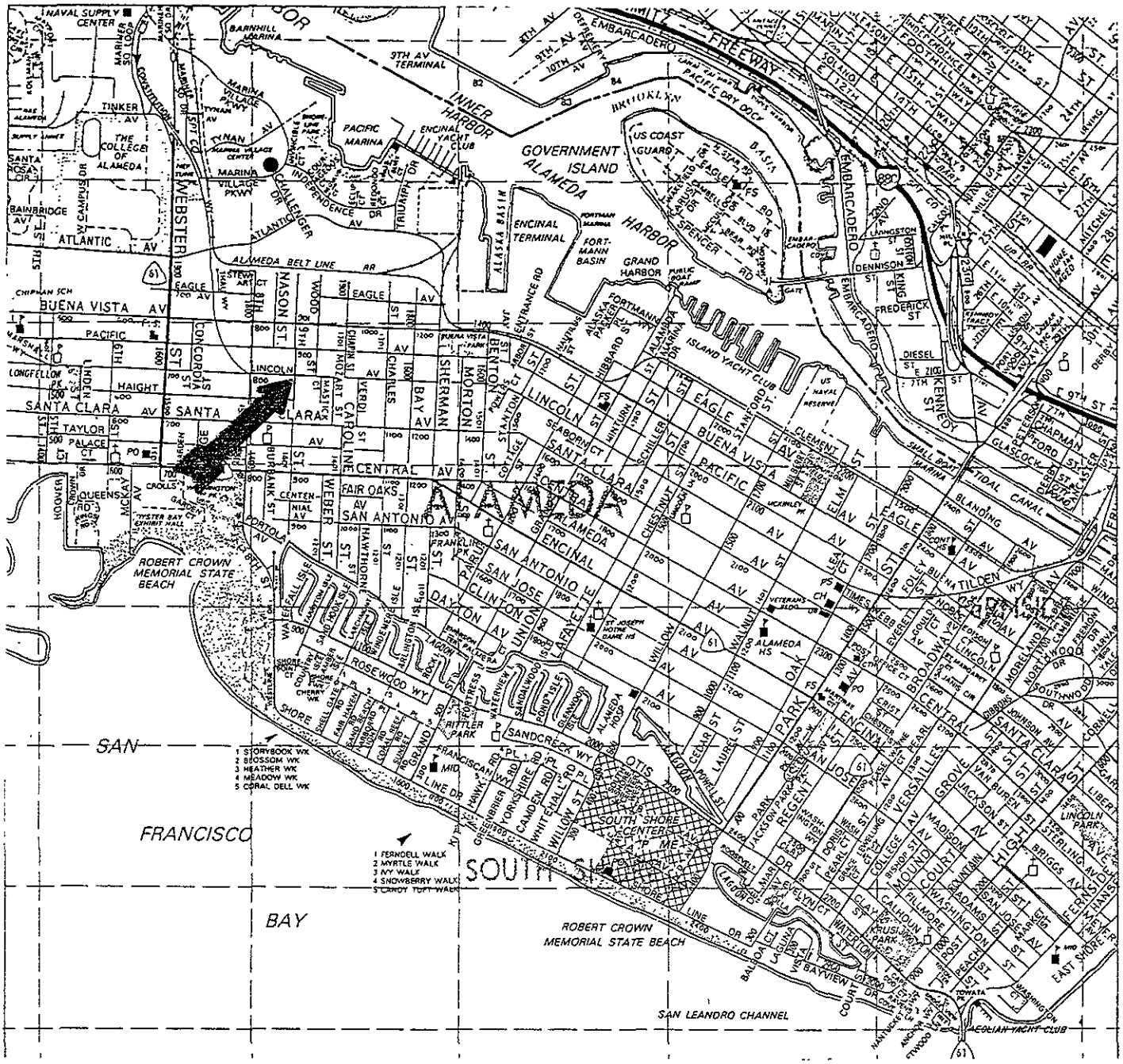
- Groundwater at the site has been monitored since 1993. The concentrations of constituents in well MW-1 have decreased significantly (Figure 4).

- The plume of concentrations is stable, based on no reportable concentrations of constituents in monitoring well MW-4 since August 1993, located 50 feet downgradient of the former UST excavation.

- According to the property owner, the building located on site is approximately 2,400 square feet; therefore, the foundation should be no deeper than 3 to 5 feet bgs. ACC believes the building has no effect on the groundwater flow at the site.

- The concentration of benzene reported in the groundwater sample collected from monitoring well MW-1 is below RBCA Tier 1 guidelines for the exposure pathway of groundwater vapor intrusion into residential buildings, based on a $1x10^{-6}$ cancer risk.

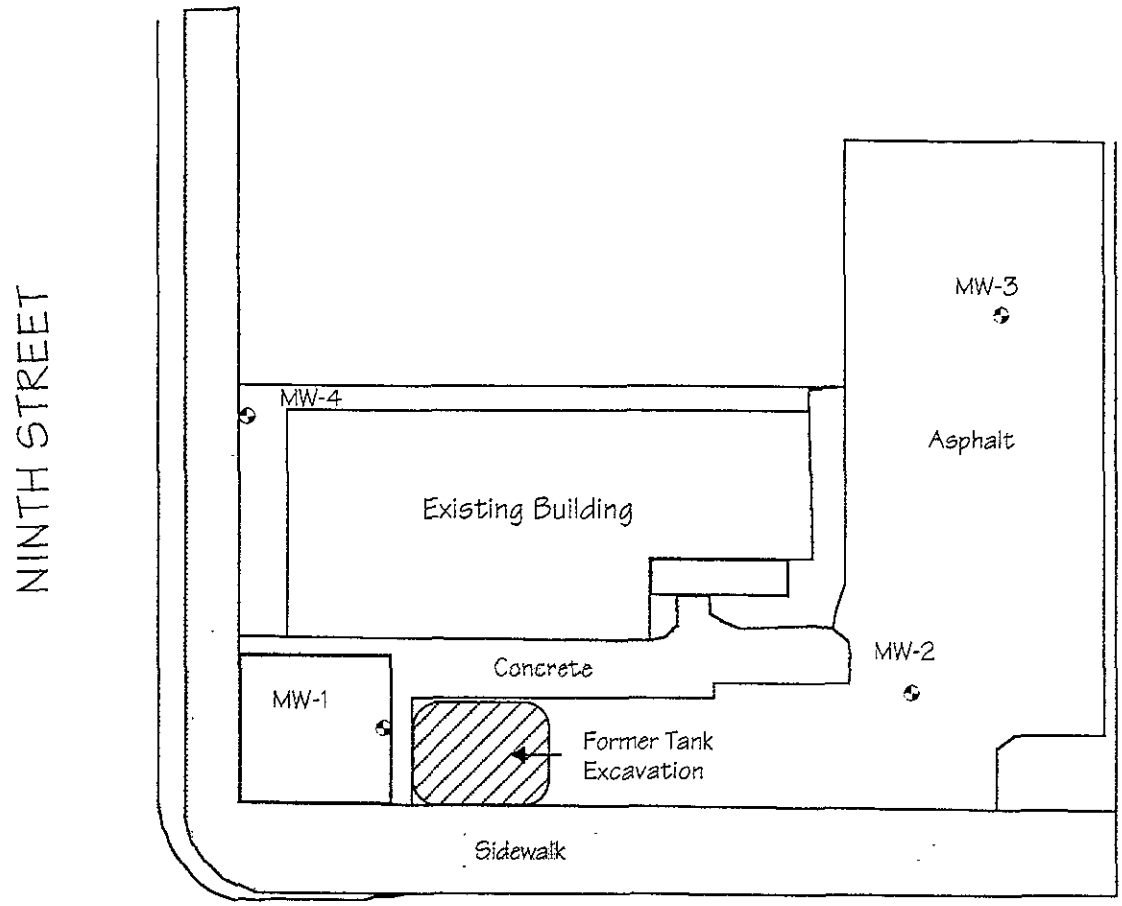
Therefore, no significant risk to human health or the environment exists from the remnant impact around monitoring well MW-1. Concentrations within monitoring well MW-1 will continue to degrade with time.



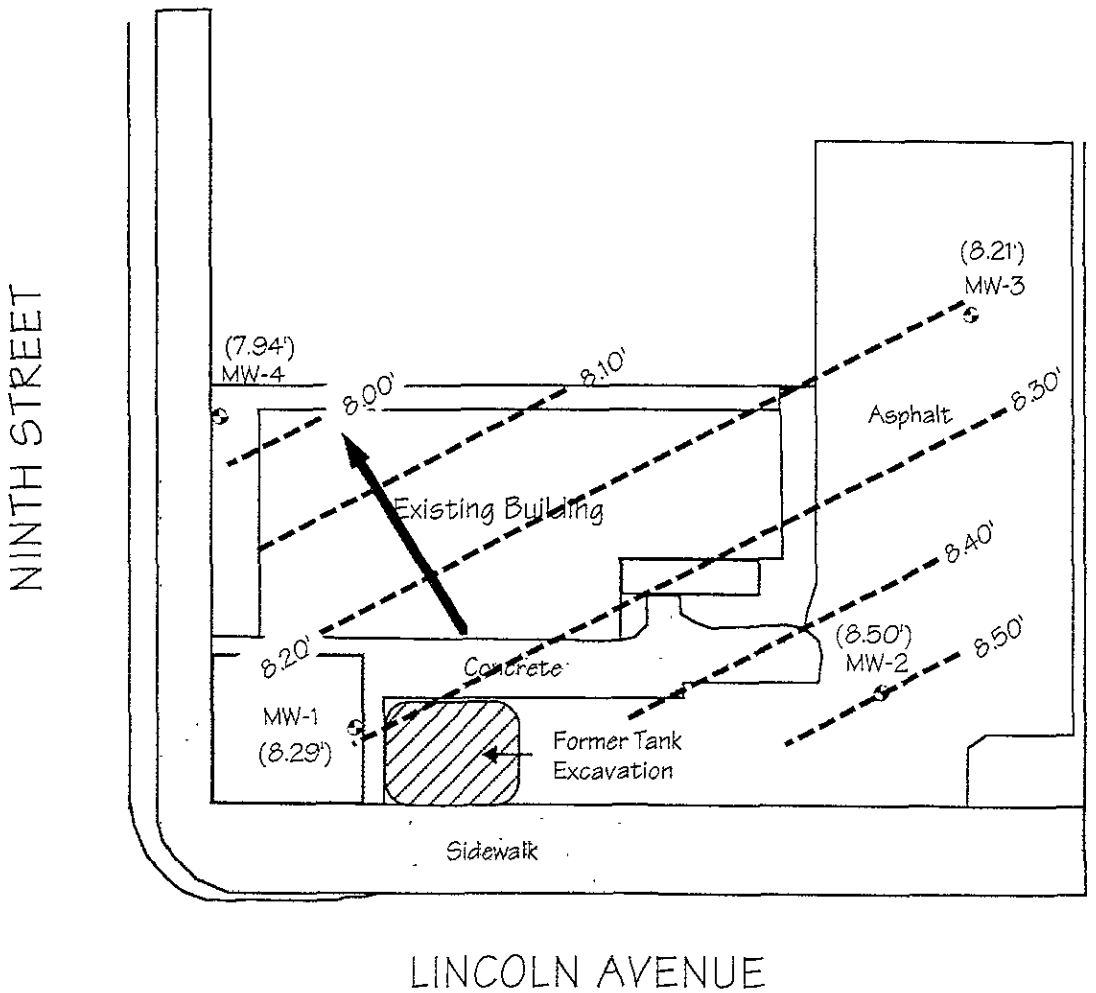
Title:	Location Map 901 Lincoln Avenue Alameda, California
Figure Number: 1.0	Scale: 1"=30'
Drawn By: EFC	Date: 4/1//96
Project Number: 6039-2b	

ACC Environmental Consultants
7977 Capwell Drive, Suite 100
Oakland, CA 94621
(510) 638-8400 Fax: (510) 638-8404

N
W E
S



Title: Site Plan 901 Lincoln Avenue Alameda, California	
Figure Number: 2.0	Scale: 1"=30'
Drawn By: JVC	Date: 10/22/96
Project Number: 6039-1.6	N W E S
ACC Environmental Consultants 7977 Capwell Drive, Suite 100 Oakland, CA 94621 (510) 638-8400 Fax: (510) 638-8404	



LEGEND

--- 8.30' Groundwater Elevation Contour

Groundwater Flow Direction

Elevations in Feet Above Mean Sea Level

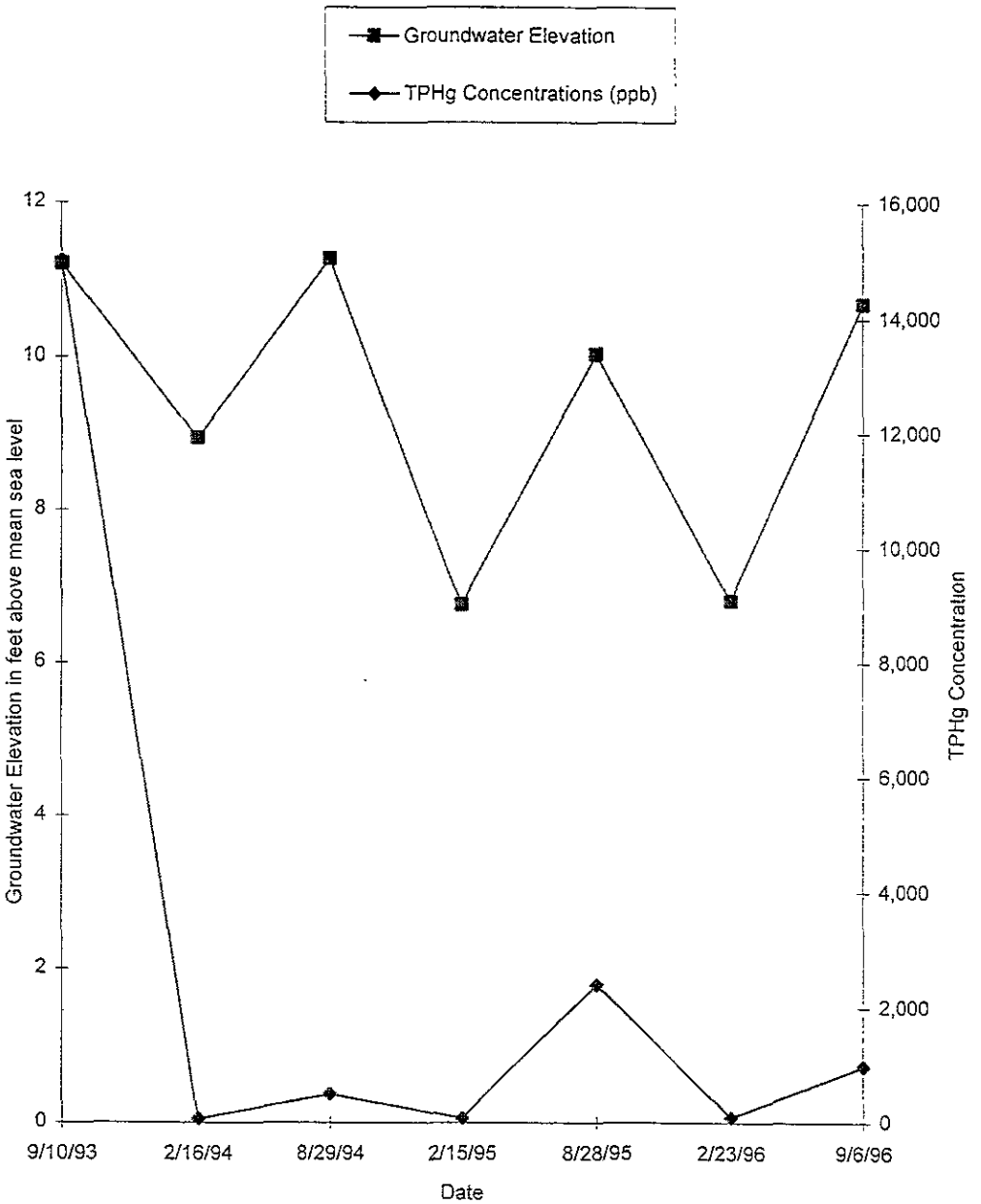
Water Levels Measured on September 6, 1996

Title: Groundwater Gradient 901 Lincoln Avenue Alameda, California	
Figure Number: 3	Scale: 1"=30'
Drawn By: EFC	Date: 4/1//96
Project Number: 6039-1.6	

ACC Environmental Consultants
7977 Capwell Drive, Suite 100
Oakland, CA 94621
(510) 638-8400 Fax: (510) 638-8404

N
W E
S

Figure 4 - Groundwater Elevation Versus TPHg Concentrations



WELL MONITORING WORKSHEET

A·C·C ENVIRONMENTAL CONSULTANTS

ACC MONITORING WELL WORKSHEET

JOB NAME: EZ Liquors #2	PURGE METHOD: Manual Bailing
SITE ADDRESS: 901 Lincoln Ave	SAMPLED BY: E. Cisneros
JOB #: 6039-26	LABORATORY: Chromalab
DATE: 9/6/96	ANALYSIS: Sulfate, Nitrate, Ferric Iron, TDS, Ferrous Iron (MW-1 & MW-4) TPHg, BTEX
Onsite Drum Inventory SOIL:	MONITORING ☒ DEVELOPING ☐
EMPTY: WATER: 1 = 100% Full	SAMPLING ☒

WELL: MW-1

DEPTH OF BORING: 13.95'
DEPTH TO WATER: 10.70'
WATER COLUMN: 3.25'
WELL DIAMETER: 2"
WELL VOLUME: ≈0.5 gal
COMMENTS:

PURGE VOLUME (Gal)	pH	Temp. (F)	Cond. un/cm	HYDAC READINGS D.O.	Sal.	Turb
0.5	6.36	23.3	.750			
1.0	6.38	22.7	.750			
1.5	6.40	22.5	.762			
2.0	6.39	22.4	.759			
				1.57	0.03	43
				1.87	0.03	219
				1.87	0.03	613
2.5	6.38	22.2	.761	1.84	0.03	658

OBSERVATIONS: ☐ Froth ☐ Sheen ☒ Odor Type gas ☐ Free Product Amount____ Type____ ☐ Other

WELL: MW-2

DEPTH OF BORING: 16.05'
DEPTH TO WATER: 10.53'
WATER COLUMN: 5.52
WELL DIAMETER: 2"
WELL VOLUME: ≈0.9 gal
COMMENTS:

PURGE VOLUME (Gal)	pH	Temp. (F)	Cond. un/cm
0.9	6.40	24.0	.254
1.8	6.33	23.2	.263
2.7	6.31	23.1	.257
3.6	6.28	23.0	.253
4.5	6.36	22.9	.248

OBSERVATIONS: ☐ Froth ☐ Sheen ☐ Odor Type____ ☐ Free Product Amount____ Type____ ☐ Other

WELL: MW-3

DEPTH OF BORING: 17.06'
DEPTH TO WATER: 11.14'
WATER COLUMN: 5.92
WELL DIAMETER: 2"
WELL VOLUME: ≈1.0 gal
COMMENTS:
Not Sampled or Purged.

PURGE VOLUME (Gal)	pH	Temp. (F)	Cond. un/cm

OBSERVATIONS: ☐ Froth ☐ Sheen ☐ Odor Type____ ☐ Free Product Amount____ Type____ ☐ Other

7977 Capwell Drive, Suite 100 • Oakland, CA 94621 • (510) 638-8400 • FAX (510) 638-8404

A·C·C ENVIRONMENTAL CONSULTANTS

ACC MONITORING WELL WORKSHEET

JOB NAME: EZ Liquors #2	PURGE METHOD: Manual Bailing
SITE ADDRESS: 901 Lincoln Ave	SAMPLED BY: E. Cisneros
JOB #: 6039-2b	LABORATORY: Chromalab
DATE: 9/6/96	ANALYSIS: Nitrate, Sulfate, Ferric Iron, Ferrous Iron TPHg, BTEX
Onsite Drum Inventory SOIL:	MONITORING ☒ DEVELOPING ☐
EMPTY: WATER: 1=100% full	SAMPLING ☒

WELL: MW-4
DEPTH OF BORING: 18.97'
DEPTH TO WATER: 10.57'
WATER COLUMN: 8.40'
WELL DIAMETER: 2"
WELL VOLUME: ≈1.4gal
COMMENTS:

PURGE VOLUME (Gal)	HYDAC READINGS pH	Temp. (F)	Cond. un/cm	OBSERVATIONS
1.4	7.22	21.6	.818	☐ Froth
2.8	6.55	20.7	.831	☐ Sheen
4.2	6.52	20.5	.805	☐ Odor Type_____
	✓	✓	✓	☐ Free Product
				Amount_____ Type_____
				☐ Other
				D.O. / Sal / Turb
				1.87 / .03 / 600
				1.83 / .03 / 999
				1.68 / .03 / 999
5.6	6.48	20.4	.801	1.73 / .03 / 999

WELL:
DEPTH OF BORING:
DEPTH TO WATER:
WATER COLUMN:
WELL DIAMETER:
WELL VOLUME:
COMMENTS:

(Gal)	pH	Temp. (F)	Cond. un/cm	
				☐ Froth
				☐ Sheen
				☐ Odor Type_____
				☐ Free Product
				Amount_____ Type_____
				☐ Other

WELL:
DEPTH OF BORING:
DEPTH TO WATER:
WATER COLUMN:
WELL DIAMETER:
WELL VOLUME:
COMMENTS:

(Gal)	pH	Temp. (F)	Cond. un/cm	
				☐ Froth
				☐ Sheen
				☐ Odor Type_____
				☐ Free Product
				Amount_____ Type_____
				☐ Other

7977 Capwell Drive, Suite 100 • Oakland, CA 94621 • (510) 638-8400 • FAX (510) 638-8404

ANALYTICAL RESULTS AND CHAIN OF CUSTODY RECORD

CHROMALAB, INC.

Environmental Services (SDB)

September 10, 1996 *Submission #:* 9609093

ACC ENVIRONMENTAL CONSULTANTS

Atten: Misty Kaltreider

Project: 901 LINCOLN *Project#:* 6039-1.0
Received: September 6, 1996

re: 2 samples for Gasoline and BTEX compounds analysis.
Method: *EPA 5030/8015M/8020*

Matrix: WATER
Sampled: September 5, 1996 *Run#:* 3036 *Analyzed:* September 9, 1996

Spl# CLIENT SPL ID	Gasoline (ug/L)	Benzene (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
99201 MW-1	980	7.2	1.1	47	5.0
99202 MW-4	N.D.	N.D.	N.D.	N.D.	N.D.
Reporting Limits	50	0.50	0.50	0.50	0.50
Blank Result	N.D.	N.D.	N.D.	N.D.	N.D.
Blank Spike Result (%)	95.6	83.4	88.2	79.9	81.4

June Zhao
Chemist

Marianne Alexander
Gas/BTEX Supervisor

510-638-8404 FM 09/13

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

September 12, 1996 *Submission #:* 9609093

ACC ENVIRONMENTAL CONSULTANTS

Atten: Misty Kaltreider

Project: 901 LINCOLN *Project#:* 6039-1.0
Received: September 6, 1996

re: One sample for Miscellaneous Metals analysis.
Method: *EPA 3010A/6010A*

Client Sample ID: **MW-1**
Spl#: 99201 *Matrix:* WATER *Extracted:* September 12, 1996
Sampled: September 5, 1996 *Run#:* 3070 *Analyzed:* September 12, 1996

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
IRON	14	0.10	N.D.	102	1

Charles Woolley
Chemist

John S. Labash
Inorganic Supervisor

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

September 12, 1996 *Submission #:* 9609093

ACC ENVIRONMENTAL CONSULTANTS

Atten: Misty Kaltreider

Project: 901 LINCOLN *Project#:* 6039-1.0
Received: September 6, 1996

re: One sample for Miscellaneous Metals analysis.
Method: *EPA 3010A/6010A*

Client Sample ID: **MW-2**
Spl#: 99203 *Matrix:* WATER *Extracted:* September 12, 1996
Sampled: September 5, 1996 *Run#:* 3070 *Analyzed:* September 12, 1996

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
IRON	15	0.10	N.D.	102	1

Charles Woolley
Chemist

John S. Tabash
Inorganic Supervisor

CHROMALAB, INC.

Environmental Services (SDB)

September 12, 1996 *Submission #:* 9609093

ACC ENVIRONMENTAL CONSULTANTS

Atten: Misty Kaltreider

Project: 901 LINCOLN *Project#:* 6039-1.0
Received: September 6, 1996

re: One sample for Miscellaneous Metals analysis.
Method: *EPA 3010A/6010A*

Client Sample ID: **MW-4**
Spl#: 99202 *Matrix:* WATER *Extracted:* September 12, 1996
Sampled: September 5, 1996 *Run#:* 3070 *Analyzed:* September 12, 1996

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
IRON	94	0.10	N.D.	102	1

Charles Woolley
Chemist

John S. Labash
Inorganic Supervisor

510-638-8404 PM 09/13

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

September 12, 1996 *Submission #:* 9609093

ACC ENVIRONMENTAL CONSULTANTS

Atten: Misty Kaltreider

Project: 901 LINCOLN *Project#:* 6039-1.0
Received: September 6, 1996

re: One sample for Soluble Miscellaneous Metals analysis.
Method: *EPA 3005A/6010A*

Client Sample ID: **MW-1**
Spl#: 99204 *Matrix:* WATER *Extracted:* September 11, 1996
Sampled: September 5, 1996 *Run#:* 3054 *Analyzed:* September 11, 1996

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
IRON	0.22	0.10	N.D.	98.6	1

Charles Woolley
Chemist

John S. Labash
Inorganic Supervisor

510-638-8404 PM 09/13

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

September 12, 1996 *Submission #:* 9609093

ACC ENVIRONMENTAL CONSULTANTS

Atten: Misty Kaltreider

Project: 901 LINCOLN *Project#:* 6039-1.0
Received: September 6, 1996

re: One sample for Soluble Miscellaneous Metals analysis.
Method: *EPA 3005A/6010A*

Client Sample ID: **MW-2**
Spl#: 99205 *Matrix:* WATER *Extracted:* September 11, 1996
Sampled: September 5, 1996 *Run#:* 3054 *Analyzed:* September 11, 1996

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
IRON	0.19	0.10	N.D.	98.6	1

Charles Woolley
Chemist

John S. Habash
Inorganic Supervisor

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Services (SDB)

September 12, 1996 *Submission #:* 9609093

ACC ENVIRONMENTAL CONSULTANTS

Atten: Misty Kaltreider

Project: 901 LINCOLN *Project#:* 6039-1.0
Received: September 6, 1996

re: One sample for Soluble Miscellaneous Metals analysis.
Method: *EPA 3005A/6010A*

Client Sample ID: **MW-4**
Spl#: 99206 *Matrix:* WATER *Extracted:* September 11, 1996
Sampled: September 5, 1996 *Run#:* 3054 *Analyzed:* September 11, 1996

ANALYTE	RESULT (mg/L)	REPORTING LIMIT (mg/L)	BLANK RESULT (mg/L)	BLANK SPIKE (%)	DILUTION FACTOR
IRON	0.15	0.10	N.D.	98.6	1

Charles Woolley
Chemist

John S. Labash
Inorganic Supervisor

1220 Quarry Lane • Pleasanton, California 94566-4756
(510) 484-1919 • Facsimile (510) 484-1096
Federal ID #68-0140157

Clayton
ENVIRONMENTAL
CONSULTANTS

Analytical Results
for
Chromalab, Inc.
Client Reference: 29623
Clayton Project No. 96091.01

Sample Identification: See Below
Lab Number: 9609101
Sample Matrix/Media: WATER
Method Reference: EPA 300.0

Date Received: 09/06/96
Date Analyzed: 09/06/96

Lab Number	Sample Identification	Date Sampled	Nitrate-N (mg/L)	Method Detection Limit (mg/L)
-01	MW-1	09/05/96	<0.05	0.05
-02	MW-2	09/05/96	4.7	0.05
-03	MW-4	09/05/96	1.1	0.05
-04	METHOD BLANK	--	<0.05	0.05

ND: Not detected at or above limit of detection
--: Information not available or not applicable

Clayton
ENVIRONMENTAL
CONSULTANTS

Analytical Results
for
Chromalab, Inc.
Client Reference: 29623
Clayton Project No. 96091.01

Sample Identification: See Below
Lab Number: 9609101
Sample Matrix/Media: WATER
Method Reference: EPA 300.0

Date Received: 09/06/96
Date Analyzed: 09/06/96

Lab Number	Sample Identification	Date Sampled	Sulfate (mg/L)	Method Detection Limit (mg/L)
-01	MW-1	09/05/96	13	2
-02	MW-2	09/05/96	25	2
-03	MW-4	09/05/96	26	2
-04	METHOD BLANK	--	<2	2

ND: Not detected at or above limit of detection
--: Information not available or not applicable

Clayton
ENVIRONMENTAL
CONSULTANTS

Analytical Results
for
Chromalab, Inc.
Client Reference: 29623
Clayton Project No. 96091.01

Sample Identification: See Below
Lab Number: 9609101
Sample Matrix/Media: WATER
Method Reference: EPA 160.1

Date Received: 09/06/96
Date Analyzed: 09/10/96

Lab Number	Sample Identification	Date Sampled	Total Dissolved Solids (mg/L)	Method Detection Limit (mg/L)
-01	MW-1	09/05/96	430	10
-02	MW-2	09/05/96	140	10
-03	MW-4	09/05/96	390	10
-04	METHOD BLANK	--	<10	10

ND: Not detected at or above limit of detection
--: Information not available or not applicable

CHROMALAB, INC.
SAMPLE RECEIPT CHECKLIST

Client Name ACC

Project 901 LINCOLN

Reference/Subm # 29623/9609093

Checklist completed by: C Rowley 9/9/96
Signature / Date

Date/Time Received 9/6/96 1745
Date / Time

Received by M Park

Carrier name

Logged in by MP 9/6/96
Initials / Date

Matrix H2O

Shipping container in good condition? NA____ Yes____ No____

Custody seals present on shipping container? Intact____ Broken____ Yes____ No____

Custody seals on sample bottles? Intact____ Broken____ Yes____ No____

Chain of custody present? Yes✓ No____

Chain of custody signed when relinquished and received? Yes✓ No____

Chain of custody agrees with sample labels? Yes✓ No____

Samples in proper container/bottle? Yes✓ No____

Samples intact? Yes✓ No____

Sufficient sample volume for indicated test? Yes✓ No____

VOA vials have zero headspace? NA____ Yes✓ No____

Trip Blank received? NA____ Yes____ No✓

All samples received within holding time? Yes✓ No____

Container temperature? 7.4°C ← Should've been 4°C

pH upon receipt _____ pH adjusted _____ Check performed by: _____ NA____

Any NO response must be detailed in the comments section below. If items are not applicable, they should be marked NA.

Client contacted? _____ Date contacted? _____

Person contacted? _____ Contacted by? _____

Regarding? _____

Comments: _____

_____

_____

_____

Corrective Action: _____

_____

_____

_____

093/99201 - 9606 [redacted] 29623

CHROMALAB, INC.

Environmental Services (SDB) (DOHS 1094)

SUBM #: 9609093 REP: PM
CLIENT: ACC
DUE: 09/13/96
REF #:29623

Chain of Custody

DATE 9/6/96 PAGE 1 OF 1

PROJ MGR Misty Kaltreider
COMPANY ACC Environmental
ADDRESS 7977 Capwell Dr., Suite100
Oakland, Ca 94621

SAMPLERS (SIGNATURE) Eloy Cisneros

(PHONE NO.) (510)638-8400
(FAX NO.) (510)638-8404

SAMPLE ID.	DATE	TIME	MATRIX	PRESERV.	TPH - Gasoline (EPA 5030, 8015)	TPH - Gasoline (5030, 8015) w/BTEX (EPA 602, 8020)	TPH - Diesel, TEPH (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, B+F, E+F)	PCB (EPA 608, 8080)	PESTICIDES (EPA 608, 8080)	TOTAL RECOVERABLE HYDROCARBONS (EPA 418.1)	Nitrate	LUFT METALS: Cd, Cr, Pb, Zn, Ni	CAM METALS (17)	PRIORITY POLLUTANT METALS (13)	TDS	EXTRACTION (TCLP, STLC)	Sulfate	Ferric Iron	Ferrous Iron	NUMBER OF CONTAINERS
MW-1	9/5/96	3:15	H_2O	HCL		X										X				X		X	X	X	6
MW-2	9/5/96	2:30	H_2O													X				X		X	X	X	3
MW-4	9/5/96	3:00	H_2O	HCL		X										X				X		X	X	X	6

PROJECT INFORMATION

PROJECT NAME: 901 Lincoln
PROJECT NUMBER: 6039-1.0
P.O. #: 6039-1.0

TAT: STANDARD 5-DAY | 24 | 48 | 72 | OTHER

SAMPLE RECEIPT

TOTAL NO. OF CONTAINERS	15
HEAD SPACE	
REC'D GOOD CONDITION/COLD	
CONFORMS TO RECORD	

SPECIAL INSTRUCTIONS/COMMENTS

RELINQUISHED BY 1	RELINQUISHED BY 2.	RELINQUISHED BY 3
(SIGNATURE) Eloy Cisneros (TIME) 5:45	(SIGNATURE) (TIME)	(SIGNATURE) (TIME)
(PRINTED NAME) Eloy Cisneros (DATE) 9/6/96	(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)
(COMPANY) ACC Environmental	(COMPANY)	(COMPANY)
RECEIVED BY 1	**RECEIVED BY 2**	**RECEIVED BY (LABORATORY) 3**
(SIGNATURE) (TIME)	(SIGNATURE) (TIME)	(SIGNATURE) Mimie Park (TIME) 1745 9/6/96
(PRINTED NAME) (DATE)	(PRINTED NAME) (DATE)	(PRINTED NAME) Chromalab (DATE)
(COMPANY)	(COMPANY)	(LAB)