



ENVIRONMENTAL INVESTIGATIONS

98 JAN 20 PM 4:05

January 13, 1998

#  
4249

Mr. Ted Walbey  
7402 Hillview Court  
Pleasanton, CA 94588

RE: Fourth Quarter Groundwater Monitoring, Former Fiesta Beverage, 966 89<sup>th</sup> Avenue,  
Oakland, CA 94621

Dear Mr. Walbey:

Thank you for contracting with Allcal Property Services, Inc. (ALLCAL) to sample groundwater monitoring wells MW-1 through MW-3 at the above-referenced property. Pursuant to a December 9, 1998, letter from the Alameda County Health Care Services Agency (ACHCSA) in which ALLCAL's December 3, 1998, Workplan was approved, water from all wells was analyzed for dissolved oxygen (before and after purging); oxidation-reduction potential (before and after purging); alkalinity; nitrates; sulfates; ferrous iron; total petroleum hydrocarbons as gasoline (TPHG); benzene, toluene, ethylbenzene, and xylenes (BTEX); and Methyl tert-Butyl Ether (MTBE).

See Attachments A, B, C, and D for ALLCAL's protocol relative to groundwater sampling, sample handling, quality assurance and quality control, and waste handling and decontamination procedures.

## DOCUMENTATION AND RESULTS OF SAMPLING

### Methodology

ALLCAL sampled wells MW-1 through MW-3 on December 15, 1998. Prior to sampling, the depth to groundwater and total well depth were measured in each well with an electronic water level meter. The measured depths are recorded on the attached Records of Water Sampling. The resultant groundwater elevations, relative to mean sea level, are recorded in attached Table 1. Measured total well depth and well construction information indicate that about 7 feet of sediment has accumulated in the casing of well MW-1. It is recommended that well MW-1 be re-developed (remove sediment from within well) prior to the next sampling event since the sediment may affect the quality of the water sampled from the well.

Before and after purging, the water in each well was measured for dissolved oxygen (DO) and oxidation-reduction potential (ORD). DO was measured using a YSI Model 55 meter and ORD was measured using an Horiba Model D 22 meter. The resultant measurements are recorded in attached

Table 2. DO was measured by lowering a probe into the water column of each well. In the approved Workplan, it was proposed to measure DO in the upper, middle, and lower thirds of each water column; however, due to the light weight of the probe and the kinked nature of the cable attached to the probe, it was difficult to determine the probe's exact depth when lowered into each well and not possible to reach the lower third of the water column. Consequently, a single depth measurement was made for DO in each well at the approximate middle of the water column. ORD was measured by collecting a water sample from each well with a dedicated bailer from the approximate middle of the water column and decanting the sample into a glass container for measurement (see attached Table 2 for DO and ORD results).

Before collecting water samples, each well was observed for floating product and purged of about 3 well volumes with a clean, disposable, dedicated, polyethylene bailer. The purge water was monitored for temperature, pH, and electrical conductivity with a Hydac meter (see attached Records of Water Sampling). No floating product was observed in any of the wells. Initially, the purge water in all wells was clear and had a gasoline odor. As each well was purged, the water became cloudy to turbid and the gasoline odor persisted. The purge water was stored on site in a labeled, 55-gallon, steel drum.

After purging, a groundwater sample was collected from each well with its dedicated bailer and decanted into two, 40-milliliter, HCL-preserved, VOA bottles having Teflon-lined caps and one, unpreserved, amber, liter bottle. (These samples were immediately delivered to the below laboratory, and the liter samples were decanted into appropriately preserved bottles for analysis of natural attenuation parameters.) All bottles were labeled to show site address, sample and sampler name, and date and time sampled, and placed in an iced-cooler for delivery, under chain-of-custody (attached), to Department of Health Services certified McCampbell Analytical Inc. (McCampbell) laboratory located in Pacheco, California. A trip blank sample was also stored as above and delivered to McCampbell for analysis as a test for cross-contamination. The samples were analyzed for alkalinity, nitrate, sulfate, ferrous iron, TPHG, BTEX, and MTBE. The reader is referred to the attached certified analytical reports for the analytical methods used for each of the above analyses.

#### Results of Groundwater Gradient Determination

For December 15, 1998, groundwater gradient was calculated to be about .011 ft./ft. in the north-northwest direction (see attached Groundwater Gradient Map). This gradient and direction of groundwater flow are consistent with historical data accumulated for the site.

Assuming the aquifer is a clayey, silty sand; that the hydraulic conductivity ranges between  $10^{-1}$  and 1 feet per day; and assuming the aquifer porosity is .30; the rate of groundwater flow may range from 1.34 to 13.4 feet per year.

### Results of Chemical Analyses

Results of DO measurements were: MW-1, .18 mg/l before purging and .37 mg/l after purging; MW-2, .21 mg/l before purging and 1.22 mg/l after purging; and MW-3, .29 mg/l before purging and .36 mg/l after purging (see attached Table 2).

Results of ORD measurements were: 30 millivolts (mv) before purging and 39 mv after purging; MW-2, 105 mv before purging and 149 mv after purging; and MW-3, 223 mv before purging and 51 mv after purging.

Alkalinity was detected in wells MW-1, MW-2, and MW-3 at concentrations 410 mg/l, 310 mg/l, and 310 mg/l, respectively.

Sulfate was detected in wells MW-1, MW-2, and MW-3 at concentrations of 20 mg/l, 36 mg/l, and 35 mg/l, respectively.

Nitrate was detected in wells MW-1, MW-2, and MW-3 at concentrations of 4 mg/l, 8 mg/l, and 10 mg/l, respectively.

Ferrous iron was detected in wells MW-1 and MW-2 at concentrations of 1.5 mg/l and 15 mg/l, respectively, and was non-detectable in MW-3.

TPHG was detected in wells MW-1, MW-2, and MW-3 at concentrations of 10,000 ug/l, 200 ug/l, and 1,400 ug/l, respectively.

Benzene was detected in wells MW-1, MW-2, and MW-3 at concentrations of 1,800 ug/l, 62 ug/l, and 200 ug/l, respectively.

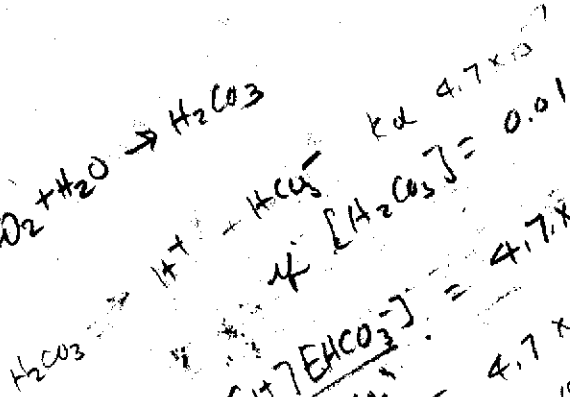
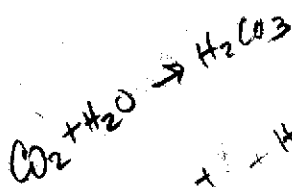
MTBE was detected in well MW-2 at a concentration of 4.4 ug/l (confirmed by EPA method 8260) and was not detected at the detection limit in MW-1 and MW-3.

The above analytical results are summarized in attached Tables 2 and 3 and documented in the attached certified analytical reports. The reader is referred to attached Table 3 for analytical results of toluene, ethylbenzene, and xylenes.

### DATA ANALYSIS

#### Well Redevelopment

Due to about 7 feet of sediment in the casing of well MW-1, it is recommended the sediment be



$$K_a [\text{H}_2\text{CO}_3] = 0.01$$

$$[\text{H}^+] \approx [\text{HCO}_3^-]$$

$$\frac{[\text{H}^+][\text{HCO}_3^-]}{\text{H}_2\text{CO}_3} = 4.7 \times 10^{-7}$$

$$[\text{H}^+]^2 = 4.7 \times 10^{-9}$$

$$\text{pH} = -\log [\text{H}^+] = 5 - .5 \approx 4.5$$

removed by redevelopment prior to the next sampling event. The sediment may be adversely effecting water quality in well MW-1.

### Gradient

For December 15, 1998, groundwater gradient was calculated to be about .011 ft./ft. in the north-northwest direction. This gradient and direction of groundwater flow are consistent with historical data accumulated for the site. The hydrogeology of the site appears to consist of an environment of low permeable materials and slow rate of groundwater flow. Assuming the aquifer is a clayey and/or silty sand (an assumption made from boring logs of the three subject wells); that the hydraulic conductivity ranges between  $10^{-1}$  and 1 feet per day; and that the aquifer porosity is .30; the rate of groundwater flow may range from 1.34 to 13.4 feet per year. This may be interpreted as a slow rate of water movement which may indicate that the contaminant plume has minimal migration and/or dispersion and insufficient replenishment of natural oxygen for petroleum-consuming bacteria to thrive and significantly biodegrade the gasoline plume.

### Natural Attenuation Indicators

Concentrations of DO within the contaminant plume are generally considered low (verbal communication with Regensis). If the concentrations of DO in the plume are lower than those outside the plume, it can be interpreted that natural, aerobic biodegradation by petroleum-consuming bacteria is occurring; however, the limited DO also limits the population of bacteria and the rate of petroleum degradation. If this is the case, the addition of oxygen to the groundwater within the plume may enhance and accelerate natural biodegradation. Since there is no DO information for groundwater outside the plume (background conditions), it is recommended that a downgradient well be installed in an effort to establish a downgradient limit to the plume and to further evaluate the measured DO concentrations.

The measured ORPs indicate an oxidizing environment in the groundwater within the plume. This is consistent with the above DO measurements and suggests that the addition of oxygen to the groundwater may enhance and accelerate natural biodegradation.

The concentration of alkalinity in a plume is also an indicator of aerobic biodegradation when compared to concentrations outside the plume. Aerobic biodegradation of petroleum products produces carbon dioxide and organic acids, both of which tend to cause a region of lower pH and increased alkalinity within the plume. To evaluate the measured alkalinity concentrations, the alkalinity outside the plume needs to be measured, as suggested for DO above.

The concentrations of sulfate, nitrate, and ferrous iron are indicators of biodegradation by anaerobic (without oxygen) degradation processes that dominate when DO is depleted. To evaluate the degree of anaerobic degradation at the site, concentrations of these parameters outside the plume need to be measured, as suggested for DO and alkalinity above.

**RECOMMENDATIONS**

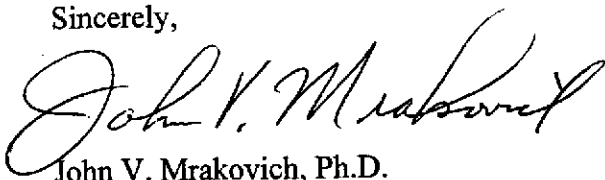
It is recommended that well MW-1 be redeveloped prior to the next sampling event to remove about 7 feet of sediment that has accumulated in the casing. The sediment may be impacting the water quality of the well.

It is recommended that a fourth well be installed in the downgradient direction. The well is recommended to be installed across 89<sup>th</sup> Avenue in the City of Oakland's easement. The purpose of this well is to explore the downgradient limits of the subject gasoline plume. Hopefully, this location will be outside of the plume and will allow for monitoring its stability (usually a requirement for site closure) and for the evaluation of the above natural attenuation parameters. It is recommended that the existing wells be monitored on an annual basis until the installation of the fourth well, since only minor changes in gasoline concentrations have been detected since 1993.

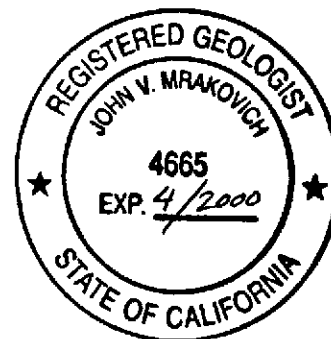
After installation of the fourth well, it is recommend that a scope of work be developed for introducing oxygen into the gasoline plume with the objective of accelerating biodegradation. It is not recommended to introduce oxygen into the three existing wells, since this would interfere with water sampling and analytical results and lead to a long-term remediation project.

If you have any questions, please call me at (510) 581-2320.

Sincerely,



John V. Mrakovich, Ph.D.  
Registered Geologist No. 4665



Phenol:

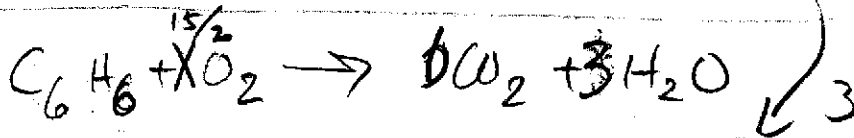
Thickness 15' x 50' x 50' = 37,500 ft<sup>3</sup> x 31 = 11625

Conc.  $\frac{10 \text{ mg/l}}{3}$

13 mg/l

37,500 x .31 x 13 x 28.3 x 10<sup>-3</sup> x  $\frac{1}{454}$  = 9.4

2.7 g x 9 = 24.3



72.9 x 10 = 729

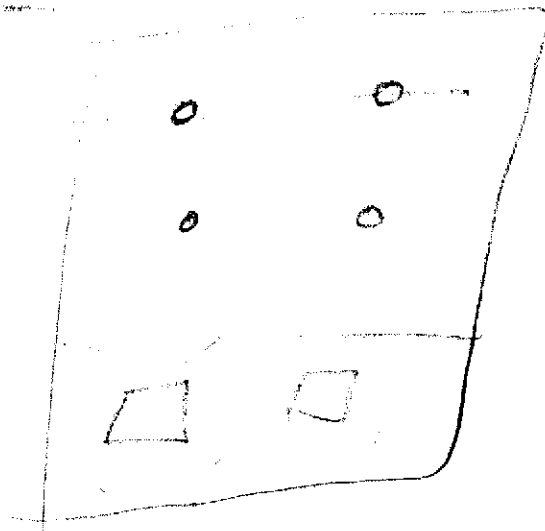
21 lbs

11' spacing

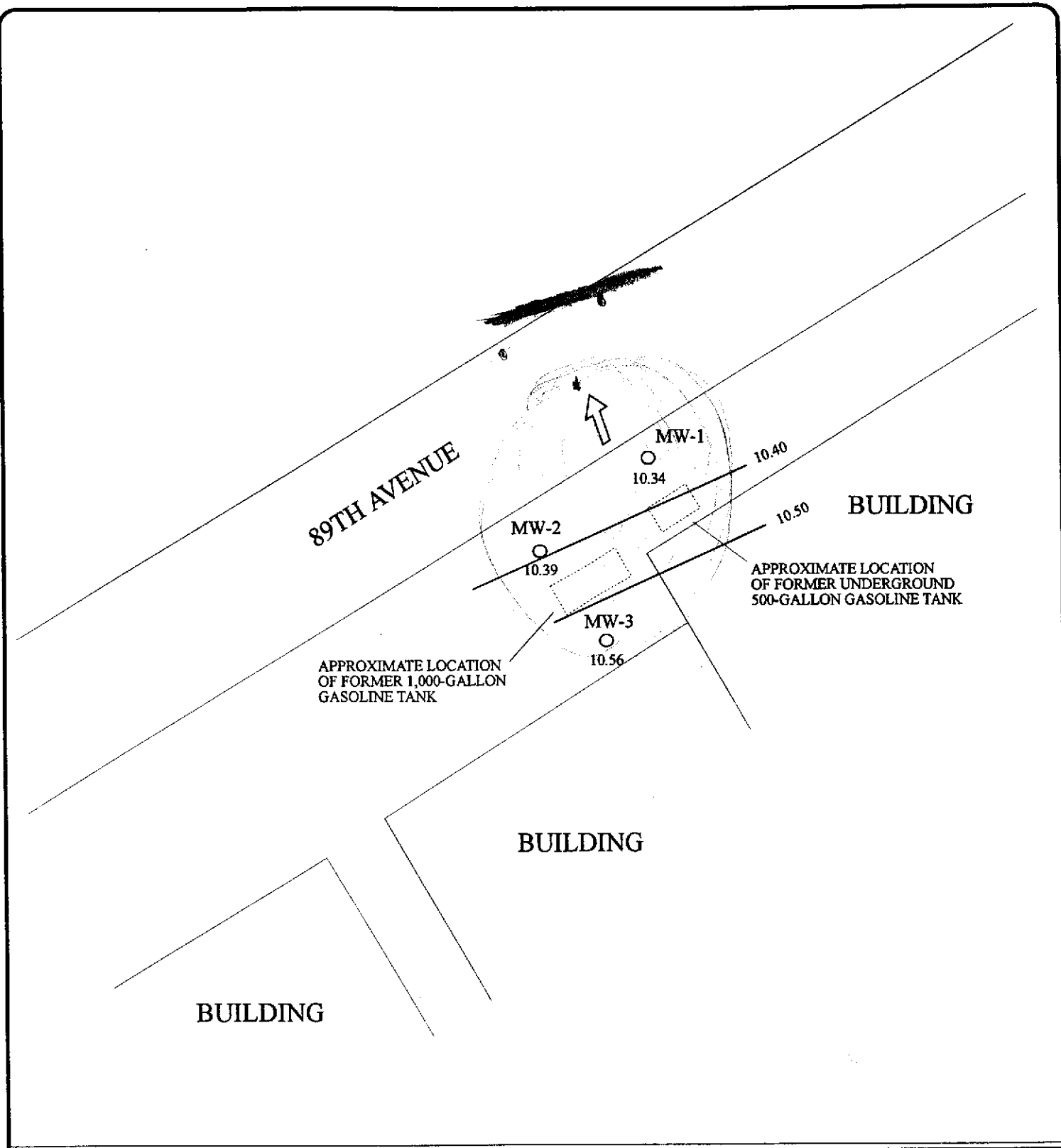
Suggest

2 rows middle zone

22 rows across zone

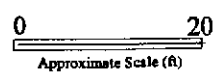






**Legend**

- MW-1  
○ Name and Location of Groundwater Monitoring Well
- 10.34 Potentiometric Elevation
- 10.40 Potentiometric Contour (12/15/98)
- ↗ Groundwater Flow Direction



**ALLCAL PROPERTY SERVICES**

FIESTA BEVERAGE  
 GROUNDWATER GRADIENT MAP  
 12/15/98  
 966 89TH AVENUE  
 OAKLAND, CA 94621

**TABLE 1**  
**GROUNDWATER ELEVATION**

Well Name	Date	Elevation TOC <sup>1</sup> (feet MSL <sup>2</sup> )	Depth to Water from TOC (feet)	Groundwater Elevation (feet MSL)
MW-1	12/15/98	18.72	8.38	10.34
MW-2	12/15/98	18.44	8.05	10.39
MW-3	12/15/98	19.01	8.45	10.56

<sup>1</sup> Top of Casing; <sup>2</sup> Mean Sea Level

**TABLE 2**  
**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS**  
**NATURAL ATTENUATION PARAMETERS**

Sample ID Name	DO <sup>1</sup> Before Purging mg/l/T <sub>c</sub>	DO After Purging mg/l/T <sub>c</sub>	ORP <sup>2</sup> Before Purging mv/l/T <sub>c</sub>	ORP After Purging mv/l/T <sub>c</sub>	Alkalinity mg/l	Sulfate mg/l	Nitrate mg/l	Ferrous Iron mg/l
MW-1	.18/18.6	.37/18.4	30/16.7	39/16.4	410	20	4	1.5
MW-2	.21/19.1	1.22/19.0	105/17.2	149/15.8	310	36	8	0.15
MW-3	.29/17.9	.36/17.9	223/14.3	51/17.0	310	35	10	<0.08

<sup>1</sup>Dissolved Oxygen, T<sub>c</sub>=Temperature in Degrees Centigrade; <sup>2</sup> Oxidation-Reduction Potential, T<sub>c</sub>=Temperature in Degrees Centigrade.

**TABLE 3**  
**SUMMARY OF GROUNDWATER ANALYTICAL RESULTS**  
**GASOLINE RANGE VOLATILE HYDROCARBONS AS GASOLINE**  
**WITH METHYL TERT-BUTYL ETHER AND BTEX**  
**(all concentrations in ug/l)**

Sample ID Name	Date	TPHG <sup>1</sup>	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE <sup>2</sup>
MW-1	08/06/93	17000	7.1	8.4	9.2	53	NA <sup>3</sup>
	01/12/96	12000	1900	840	370	1100	NA
	04/16/96	3500	700	55	100	180	NA
	07/15/96	11000	2300	450	350	910	NA
	10/16/96	21000	4200	2200	650	2600	NA
	12/15/98	10000	1800	520	270	1100	<350
MW-2	08/06/93	2700	1.3	1.7	2.0	8.1	NA
	01/12/96	2700	600	310	94	220	NA
	04/16/96	190	39	11	10	14	NA
	07/15/96	700	160	33	34	48	NA
	10/16/96	190	48	8.2	10	13	NA
	12/15/98	200	62	17	4.9	14	4.4 <sup>4</sup>
MW-3	08/06/93	5200	2.1	2.9	3.6	17	NA
	01/12/96	4500	280	180	120	470	NA
	04/16/96	5400	370	340	160	580	NA
	07/15/96	1800	200	220	66	250	NA
	10/16/96	2000	340	140	100	300	NA
	12/15/98	1400	200	39	72	150	<22

<sup>1</sup> Total Petroleum Hydrocarbons as Gasoline; <sup>2</sup> Methyl tert-Butyl Ether; <sup>3</sup> Not Analyzed;

<sup>4</sup> Confirmed by EPA Method 8260 Modified

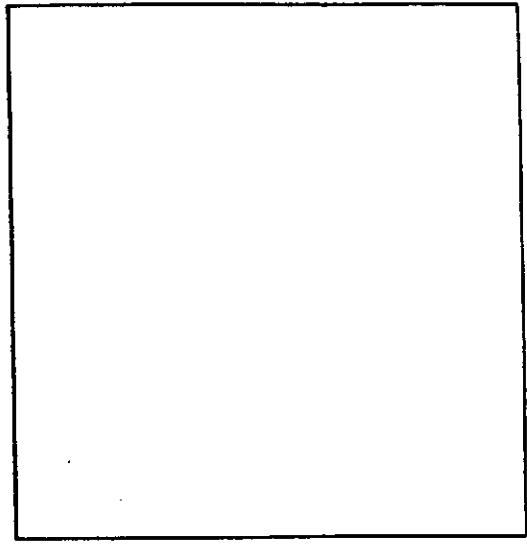
**RECORD OF WATER SAMPLING**

PROJECT NO.: 133 DATE: 12/15/98  
 PROJECT NAME: FIESTA BEVERAGE  
 PROJECT LOCATION: 966 89<sup>th</sup> AVE, OAKLAND  
 SAMPLER: JOHN MRAKOVICH / ALCOA  
 ANALYSES: TPH, BTEX, MTBE + NATURAL ATTENUATION PARAMETERS  
 WELL DEPTH (from construction detail): 25'

WELL NO.: MW-1  
 WELL DIAMETER: 2"  
 TOC ELEV: 18.72  
 LOCK NO.: \_\_\_\_\_

WELL DEPTH (measured): 17.7 SOFT BOTTOM?: Y  
 DEPTH TO WATER: 8.98 TIME: 8:52  
 PRESSURE (circle one): YES OR **(NO)**  
 IF YES, WAS PRESSURE (circle one): POSITIVE OR NEGATIVE?

WATER VOLUME IN WELL: 1.49 GAL  
 [2-INCH CASING = 0.16 GAL/FT] [4-INCH CASING = 0.65 GAL/FT]  
 [6-INCH CASING = 1.47 GAL/FT] [1 GAL = 3.78 L]



LOCATION MAP

CALCULATED PURGE VOL. (GAL): 4.50 (L): 17.01 ACTUAL PURGE VOL. (GAL): \_\_\_\_\_ (L): 20  
 PURGE METHOD: POLYETHYLENE BAILER SAMPLE METHOD: POLYETHYLENE BAILER

**FIELD MEASUREMENTS**

Time	Depth to Water (FT)	Vol (L)	Temp (Deg. F)	pH	EC	Clarity	Turbidity (NTU)	Remarks
11:05		1	58.1	7.26	7.90			Clear
11:11		6	59.5	7.05	8.74			Modest color, turbid
11:14		10	60.8	6.99	8.94			↓ Sampled @ 11:25
11:17		15	60.8	6.93	8.78			
11:20		20	61.3	6.92	8.59			

SIGNATURE: J. MraKovich

WATER VOL. IN DRUM: \_\_\_\_\_  
 NEED NEW DRUM?: NO

**RECORD OF WATER SAMPLING**

PROJECT NO.: 133 DATE: 12/15/98  
 PROJECT NAME: FIESTA BEVERAGE  
 PROJECT LOCATION: 966 89<sup>th</sup> AVE., OAKLAND  
 SAMPLER: JOHN MRAKOVICH/ALLCAL

WELL NO.: MW-2  
 WELL DIAMETER: 2"  
 TOC ELEV: 18.44  
 LOCK NO.: \_\_\_\_\_

ANALYSES: TPHS, BTEX, MTBE + NATURAL  
ATTENUATION PARAMETERS  
 WELL DEPTH (from construction detail): 25'

WELL DEPTH (measured): 24.82 SOFT BOTTOM?: Y

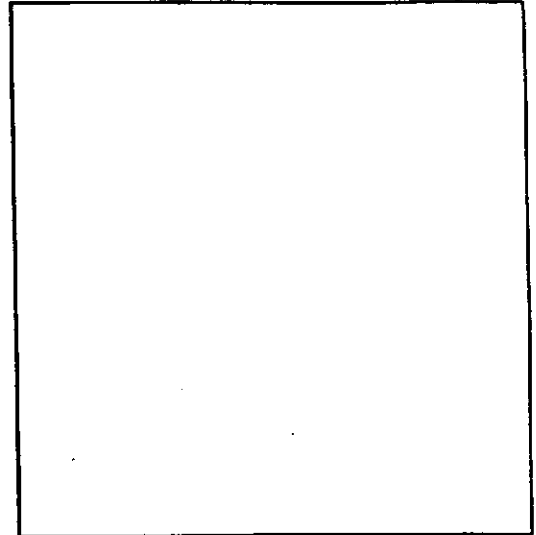
DEPTH TO WATER: 8.05 TIME: 8:57

PRESSURE (circle one): YES OR NO

IF YES, WAS PRESSURE (circle one): POSITIVE OR NEGATIVE?

WATER VOLUME IN WELL: 2.68

[2-INCH CASING = 0.16 GAL/FT] [4-INCH CASING = 0.65 GAL/FT]  
 [6-INCH CASING = 1.47 GAL/FT] [1 GAL = 3.78 L]



LOCATION MAP

CALCULATED PURGE VOL. (GAL): 8.0 (L): 30.24 ACTUAL PURGE VOL. (GAL): \_\_\_\_\_ (L): 25

PURGE METHOD: POLYETHYLENE BAILER SAMPLE METHOD: POLYETHYLENE BAILER

**FIELD MEASUREMENTS**

*X100*

Time	Depth to Water (FT)	Vol (L)	Temp (Deg. F)	pH	EC	Clarity	Turbidity (NTU)	Remarks
10:35		1	58.9	7.48	6.71			clear
10:40		10	59.4	7.37	6.74			Moderate Odor, Cloudy
10:40		15	60.1	7.33	6.85			↓ Sampled 11:00
10:50		20	61.1	7.27	6.93			
10:54		25	61.2	7.23	6.92			

SIGNATURE: J. Mrakovich

WATER VOL. IN DRUM: \_\_\_\_\_  
 NEED NEW DRUM?: NO

**RECORD OF WATER SAMPLING**

PROJECT NO.: 133 DATE: 12/15/98  
 PROJECT NAME: FIESTA BEVERAGE  
 PROJECT LOCATION: 966 89th AVE, OAKLAND  
 SAMPLER: JOHN MRAKOVICH/ALCAL

WELL NO.: MW-3  
 WELL DIAMETER: 2'  
 TOC ELEV: 19.01  
 LOCK NO.: \_\_\_\_\_

ANALYSES: TPHG, STEK, MTBE + NATURAL ATTENUATION PARAMETERS  
 WELL DEPTH (from construction detail): 25

WELL DEPTH (measured): 24.9 SOFT BOTTOM?: Y

DEPTH TO WATER: 23.45 TIME: 9:07

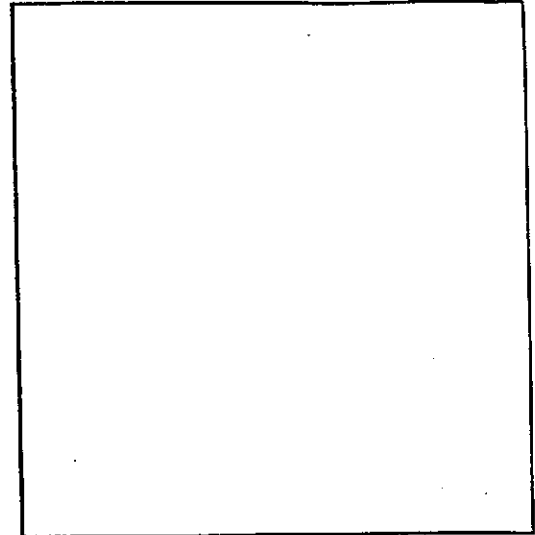
PRESSURE (circle one): YES OR (NO)

IF YES, WAS PRESSURE (circle one): POSITIVE OR NEGATIVE?

WATER VOLUME IN WELL: 2.63

[2-INCH CASING = 0.16 GAL/FT] [4-INCH CASING = 0.65 GAL/FT]

[6-INCH CASING = 1.47 GAL/FT] [1 GAL = 3.78 L]



LOCATION MAP

CALCULATED PURGE VOL. (GAL): 7.9 (L): 29.86 ACTUAL PURGE VOL. (GAL): \_\_\_\_\_ (L): 25

PURGE METHOD: POLYETHYLENE BAILER SAMPLE METHOD: POLYETHYLENE BAILER

**FIELD MEASUREMENTS**

x100

Time	Depth to Water (FT)	Vol (L)	Temp (Deg. F)	pH	EC	Clarity	Turbidity (NTU)	Remarks
9:50		1	58.3	10.31	6.24			Clear
9:58		10	58.2	8.46	6.74			Strong Odor - Brown Color ↓
10:04		15	59.5	8.15	6.64			
10:10		20	59.1	7.90	6.44			
10:15		25	59.2	7.70	6.60			
								Sampled 10:20

SIGNATURE: J. Mrakovich

WATER VOL. IN DRUM: \_\_\_\_\_  
 NEED NEW DRUM?: NO



McCAMPBELL ANALYTICAL INC.

110 Second Avenue South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

ALLCAL Property Services 27973 High Country Drive Hayward, CA 94542-2530	Client Project ID: #133; Fiesta Beverages	Date Sampled: 12/15/98
		Date Received: 12/15/98
	Client Contact: John Mrakovich	Date Extracted: 12/15/98
	Client P.O:	Date Analyzed: 12/15/98

12/22/98

Dear John:

Enclosed are:

- 1). the results of 4 samples from your #133; Fiesta Beverages project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Edward Hamilton, Lab Director







McCAMPBELL ANALYTICAL INC.

110 Second Avenue South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
<http://www.mccampbell.com> E-mail: [main@mccampbell.com](mailto:main@mccampbell.com)

ALLCAL Property Services 27973 High Country Drive Hayward, CA 94542-2530	Client Project ID: #133; Fiesta Beverages	Date Sampled: 12/15/98
	Client Contact: John Mrakovich	Date Received: 12/15/98
	Client P.O:	Date Extracted: 12/22/98
		Date Analyzed: 12/22/98

**Methyl tert-Butyl Ether \***

EPA method 8260 modified

Lab ID	Client ID	Matrix	MTBE*	% Recovery Surrogate
00188	MW-2	W	4.4	103
Reporting Limit unless otherwise stated; ND means not detected above the reporting limit	W		1.0 ug/L	
	S		5.0 ug/kg	

\* water samples are reported in ug/L, soil and sludge samples in ug/kg, wipe samples in ug/wipe and all TCLP / STLC / SPLP extracts in ug/L

h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment.

DHS Certification No. 1644

14 Edward Hamilton, Lab Director

## QC REPORT FOR HYDROCARBON ANALYSES

Date: 12/15/98

Matrix: WATER

Analyte	Concentration (mg/L)			Amount Spiked	% Recovery		RPD
	Sample (#00071)	MS	MSD		MS	MSD	
TPH (gas)	0.0	92.2	92.7	100.0	92.2	92.7	0.5
Benzene	0.0	9.7	9.7	10.0	97.0	97.0	0.0
Toluene	0.0	10.2	10.0	10.0	102.0	100.0	2.0
Ethyl Benzene	0.0	10.0	10.0	10.0	100.0	100.0	0.0
Xylenes	0.0	30.7	31.0	30.0	102.3	103.3	1.0
TPH(diesel)	0.0	164	163	150	109	108	0.7
TRPH (oil & grease)	0	23810	23645	23700	100	100	0.7

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

## QC REPORT FOR VOCs (EPA 8240/8260 )

Date: 12/21/98-12/22/98

Matrix: WATER

Analyte	Concentration (ug/kg, u Sample (#00435)			Amount Spiked	% Recovery		RPD
	MS	MSD			MS	MSD	
1,1-Dichloroethe	0	116	116	100	116	116	0.0
Trichloroethene	0	85	85	100	85	85	0.0
EDB	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Chlorobenzene	0	90	91	100	90	91	1.1
Benzene	0	90	92	100	90	92	2.2
Toluene	0	92	94	100	92	94	2.2

$$\% \text{ Rec.} = (\text{MS} - \text{Sample}) / \text{amount spiked} \times 100$$

$$\text{RPD} = (\text{MS} - \text{MSD}) / (\text{MS} + \text{MSD}) \times 2 \times 100$$

# GeoAnalytical Laboratories, Inc.

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## CERTIFICATE OF ANALYSIS


Report # J350-05  
McCampbell Analytical  
110 2nd Avenue #D7  
Pacheco CA 94553-5560

Date of Report: 12/23/98  
Date Received: 12/16/98  
Date Started: 12/16/98  
Date Completed: 12/22/98

Project Name: A- Fiesta Bev.

Project # 13327

Sample ID	Lab ID	Detection Limit	Method	Analyte	Results	Units mg/L
MW-1	J36250	10	310.1	Total Alkalinity	410	
		1	300	Nitrate	4	
		1	300	Sulfate	20	
MW-2	J36251	10	310.1	Total Alkalinity	310	
		1.0	300	Nitrate	8	
		1	300	Sulfate	36	
MW-3	J36252	10	310.1	Total Alkalinity	310	
		1.0	300	Nitrate	10	
		1	300	Sulfate	35	

  
Ramiro Salgado  
Chemist

Certification # 1157

  
Donna Keller  
Laboratory Director

# GeoAnalytical Laboratories, Inc.

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## QC REPORT

Report# J350-05

Date: 12/28/98

Lab ID

Dates Analyzed: 12/16/98-12/22/98


McC Campbell Analytical  
110 2nd Avenue #D7  
Pacheco CA 94553-5560

Method: 300

Samples Analyzed: J36250,J36251,J36252,J36266,J36241

Sample Spiked: J36266,J36241

Analyte	Matrix Spike %	Matrix Spike Duplicate %	Relative Percent Difference (%)	Blank
Nitrate	90.0	92.0	1.9	ND
Sulfate	92.0	88.0	4.4	ND

  
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Laboratory Director

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---

## QC REPORT

Report# J350-05

Date: 12/28/98

Lab ID

Dates Analyzed: 12/16/98-12/22/98


McC Campbell Analytical  
110 2nd Avenue #D7  
Pacheco CA 94553-5560

Method: 310.1

Samples Analyzed: J36142,J36143,J36144,J36231,J36232,J36250,J36251,J36252

Sample Spiked: J36142

Analyte	Original Sample	Duplicate Sample	Relative Percent Difference (%)	Blank
Alkalinity	90	90	0.0	ND

  
Ramiro Salgado  
Chemist

Certification # 1157

  
Donna Keller  
Laboratory Director





## ATTACHMENT A

### GROUNDWATER SAMPLING PROCEDURES

Groundwater monitoring wells will not be sampled until at least 48 hours after well development. Groundwater samples will be obtained using either a bladder pump, clear Teflon bailer, or polyethylene bailer. Prior to sampling, sampling equipment will be thoroughly decontaminated to prevent introduction of contaminants into the well and to avoid cross-contamination. Monitoring wells will be sampled after three to five wetted casing volumes of groundwater have been evacuated and after the ALLCAL sampling team leader determines that water representative of the formation is being obtained. The well will be purged until conductivity has been stabilized (three consecutive conductivity reading within 15% of one another). If the well is emptied before four to ten well volumes are removed, the sample shall be taken when the water level in the well recovers to 80% of its initial water level or better.

ALLCAL will also measure the thickness of any floating product in the monitoring wells using a probe or clear Teflon bailer. The floating product will be measured after well development but prior to the collection of groundwater samples. If floating product is present in the well, ALLCAL will recommend to the client that product removal be commenced immediately and reported to the appropriate regulatory agency.

Unless specifically waived or changed by the local, prevailing regulatory agency, water samples shall be handled and preserved according to the latest EPA methods as described in the Federal Register (Volume 44, No.233, Page 69544, Table II) for the type of analysis to be performed.

#### MEASUREMENTS

Purged Water Parameter: During purging, discharged water will be measured for the following parameters.

<u>Parameter</u>	<u>Units of Measurement</u>
pH	Units
Electrical conductivity	Umhos
Temperature	Degrees F or C
Depth to Water	Feet/Tenths
Volume of Water Discharged	Liters

Documentation: All parameter measurements shall be documented in writing on ALLCAL development logs.

## ATTACHMENT B

### SAMPLE HANDLING PROCEDURES

Soil and groundwater samples will be packaged carefully to avoid breakage or contamination and will be delivered to the laboratory in an iced-cooler. Sample bottle/sleeve lids will not be mixed. All sample lids will stay with the original containers.

Samples will be stored in iced-coolers to maintain custody, control temperature, and prevent breakage during transportation to the laboratory. Ice, blue ice, or dry ice (dry ice will be used for preserving soil samples collected for the Alameda County Water District) will be used to cool samples during transport to the laboratory. Water samples will be cooled with crushed ice. In the Alameda County Water District, water samples will be buried in the crushed ice with a thermometer, and the laboratory will be requested to record thermometer temperature at the time of receipt.

Each sample will be identified by affixing a label on the container(s). This label will contain the site identification, sample identification number, date and time of sample collection, and the collector's initials.

Soil samples collected in brass or stainless-steel tubes will be preserved by covering the ends with Teflon tape and capping with plastic end-caps. The tubes will be labeled, sealed in quart-size bags, and placed in an iced-cooler for transport to the laboratory.

All groundwater sample containers will be precleaned and will be obtained from a State Department of Health Services certified analytical laboratory.

A chain-of-custody form will be completed for all samples and accompany the sample cooler to the laboratory. All sample transfers will be documented in the chain-of-custody. All field personnel are personally responsible for sample collection and the care and custody of collected samples until the samples are transferred or properly dispatched.

The custody record will be completed by the field technician or professional who has been designated as being responsible for sample shipment to the appropriate laboratory. The custody record will include the following information: site identification, name of person collecting the sample(s), date and time sample(s) were collected, type of sampling conducted (composite/grab), location of sampling station, number and type of containers used, and signature of the person relinquishing samples to another person with the date and time of transfer noted.

## ATTACHMENT C

## QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

The overall objectives of the field sampling program include generation of reliable data that will support development of a remedial action plan. Sample quality will be checked by the use of proper sampling, handling, and testing methods. Additional sample quality control methods may include the use of background samples, equipment rinsate samples, and trip and field blanks. Chain-of-custody forms, use of a qualified laboratory, acceptable detection limits, and proper sample preservation and holding times also provide assurance of accurate analytical data.

A quality assurance and quality control (QA/QC) program may be conducted in the field to ensure that all samples collected and field measurements taken are representative of actual field and environmental conditions and that data obtained are accurate and reproducible. These activities and laboratory QA/QC procedures are described below.

Field Samples: Additional samples may be taken in the field to evaluate both sampling and analytical methods. Three basic categories of QA/QC samples that may be collected are trip blanks, field blanks, and duplicate samples.

Trip blanks are a check for cross-contamination during sample collection, shipment, and laboratory analysis. They are water samples that remain with the collected samples during transportation and are analyzed along with the field samples to check for residual contamination. Analytically confirmed organic-free water will be used for organic parameters and de-ionized water for metal parameters. Blanks will be prepared by the laboratory supplying the sample containers. The blanks will be numbered, packaged, and sealed in the same manner as the other samples. One trip blank will be used for each sample set of less than 20 samples. At least 5% blanks will be used for sets greater than 20 samples. The trip blank is not to be opened by either the sample collectors or the handlers.

The field blank is a water sample that is taken into the field and is opened and exposed at the sampling point to detect contamination from air exposure. The water sample is poured into appropriate containers to simulate actual sampling conditions. Contamination due to air exposure can vary considerably from site to site.

The laboratory will not be informed about the presence of trip and field blanks, and false identifying numbers will be put on the labels.

Duplicate samples are identical sample pairs (collected in the same place and at the same time), placed in identical containers. For soils, adjacent sample liners will be analyzed. For the purpose of data reporting, one is arbitrarily designated the sample, and the other is designated as a duplicate sample. Both sets of results are reported to give an indication of

the precision of sampling and analytical methods.

The laboratory's precision will be assessed without the laboratory's knowledge by labeling one of the duplicates with false identifying information. Data quality will be evaluated on the basis of the duplicate results.

Laboratory QA/QC: Execution of a strict QA/QC program is an essential ingredient in high-quality analytical results. By using accredited laboratory techniques and analytical procedures, estimates of the experimental values can be very close to the actual value of the environmental sample. The experimental value is monitored for its precision and accuracy by performing QC tests designed to measure the amount of random and systematic errors and to signal when correction of these errors is needed.

The QA/QC program describes methods for performing QC tests. These methods involve analyzing method blanks, calibration standards, check standards (both independent and the United States Environmental Protection Agency-certified standards), duplicates, replicates, and sample spikes. Internal QC also requires adherence to written methods, procedural documentation, and the observance of good laboratory practices.

## ATTACHMENT D

### WASTE HANDLING AND DECONTAMINATION PROCEDURES

Decontamination: Any drilling, sampling, or field equipment that comes into contact with soil or groundwater will be decontaminated prior to its use at the site and after each incident of contact with the soil or groundwater being investigated. Decontamination is essential to obtain samples that are representative of environmental conditions and to accurately characterize the extent of soil and groundwater contamination. Hollow-stem auger flights, the drill bit, and all other soil boring devices will be steam-cleaned between the drilling of each boring.

All sample equipment, including the split-spoon sampler and brass or stainless-steel tubes, will be cleaned by washing with trisodium phosphate or Alconox detergent, followed by rinsing with tap water. Where required by specific regulatory guidelines, a nonphosphate detergent will be used.

Waste Handling: Waste materials generated during site characterization activities will be handled and stored as hazardous waste and will be stored on site in appropriately labeled containers. Waste materials anticipated include: excavated soil, drill cuttings, development and purge water, water generated during aquifer testing, water generated during decontamination, and used personnel protection equipment such as gloves and Tyvek. The site owner will be responsible for providing the storage containers and will be responsible for the disposal of the waste materials. Drill cuttings from individual borings will be stored separately in drums or covered by plastic sheeting, and the appropriate disposal procedure will be determined by the site owner following receipt of the soil sample analytical results. Storage containers will be labeled to show material stored, known or suspected contaminant, date stored, expected removal date, company name, contact, and telephone number.