



ENVIRONMENTAL ENGINEERING, INC

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November 29, 2000

Ms. Susan Hugo
Alameda County
Department of Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Subject: Former Berkeley Farms Site
Located at 4550 San Pablo Avenue
Emeryville, California

Dear Susan:

Enclosed for your review is SOMA's report entitled "Third Quarter 2000 Groundwater Monitoring" for the subject site.

If you have any questions or comments, please call me at (925) 244-6600.

Sincerely,

A handwritten signature in black ink, appearing to read 'Mansour Sepehr', is written over a horizontal line.

Mansour Sepehr, Ph.D., P.E.
Principal

Enclosure

cc: Ms. Carol Light, P.E. w/enclosure
Silverman & Light

Mr. Robert Daoust w/enclosure

00 NOV 31 AM 9:29
ENVIRONMENTAL
PROTECTION

00 DEC -4 PM 3:20
ENVIRONMENTAL
PROTECTION

**Third Quarter
Groundwater Monitoring Report
Emeryville Farms Property
4550 San Pablo Avenue
Emeryville, California**

Project 99-2371

November 21, 2000

Prepared for

**Emeryville Farms and Associates
1201 Park Avenue, Suite 100
Emeryville, California 94608**

Prepared by

**SOMA Environmental Engineering, Inc.
2680 Bishop Drive, Suite 203
San Ramon California 94583**

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1.0 Introduction

This groundwater monitoring report has been prepared by SOMA Environmental Engineering, Inc. (SOMA) on behalf of Emeryville Farms and Associates, the current owner of the site. The site is located at 4550 San Pablo Avenue, Emeryville, California (the "Site"). Figure-1 shows the Site vicinity map. The purpose of this monitoring report is to evaluate the current status of groundwater contamination beneath the Site, which reportedly has been impacted by petroleum hydrocarbons. The report also presents the results of the third quarter monitoring event of the off-site monitoring wells, which were monitored concurrently with the on-site wells on September 19, 2000. The off-site monitoring wells are located at the Former Berkeley Truck Shop and Yard located on the opposite side of the Site across San Pablo Avenue, as shown in Figure 2.

2.0 Site Background

The former Berkeley Farms operation consisted of an operating dairy facility, a truck shop and a yard located on the opposite side of the Site across San Pablo Avenue between 47th and 45th Streets in Emeryville, California. The property was purchased in 1946 and has operated as a dairy facility since that time. The dairy facility, which is the subject of this report, is located at 4550 San Pablo Avenue (Figure 1). The Site is bound by San Pablo Avenue on the west, by 47th Street on the north and by 45th Street on the south, as shown in Figure 2. Currently, a two-story building occupies the northwestern portion of the property. The remainder of the property is entirely paved and enclosed within a concrete block wall. The facility is accessed through secured gates on San Pablo Avenue and 47th Street.

Berkeley Farms suspended operations at the Site in December of 1997. Two 10,000-gallon underground storage tanks were used by Berkeley Farms to store diesel fuel

and unleaded gasoline at the Site. In 1998, the underground storage tanks were removed by Geo-Logic, a consultant firm hired by Berkeley Farms.

Emeryville Farms and Associates purchased the property in December 1999. In December 1999, Emeryville Farms hired SOMA to conduct additional site investigation and prepare a Site closure report. The result of SOMA's Comprehensive Site Closure Report (SOMA, February 2000) was submitted to Alameda County Department of Health Services (ACDHS). On April 12, 2000, ACDHS, upon concurrence with SOMA's recommendations, issued a no further action (NFA) letter to the Site's owners. In the NFA letter, ACDHS required that three additional quarterly groundwater monitoring events be conducted at the Site. ACDHS specified that the groundwater samples from MW-1 and MW-2 must be analyzed for total petroleum hydrocarbon (TPH) as diesel, TPH as gasoline, benzene, toluene, ethylbenzene, xylene, methyl tertiary butyl ether (MTBE) and semivolatile organic compounds using EPA Method 8270.

As explained above, the former Berkeley Farms operation consisted of an operating dairy facility, a truck shop and a yard located on the opposite side of the Site across San Pablo Avenue between 47th and 45th Streets in Emeryville, California. The truck shop and yard located on the opposite side of San Pablo Avenue still belongs to Berkeley Farms. At this site, still there are two groundwater monitoring wells, which are being monitored by Geo-Logic on a quarterly basis. In order to evaluate the mobility of the groundwater plume and consistency of the groundwater flow direction, ACDHS, in their letter dated April 12, 2000, has requested that Emeryville Farms coordinate the groundwater monitoring event with the Berkeley Farms' consultant (Geo-Logic). Due to the fact that the second quarter groundwater monitoring event was performed by SOMA on April 6, 2000, before receiving the ACDHS's letter, such coordination was not possible. However, based on our arrangement with Geo-Logic,

the current monitoring event (third quarter groundwater monitoring event) was coordinated with Geo-Logic.

2.1 Hydrogeology

The Site is located at or near the mapped contact between medium-grained and fine-grained alluvium deposits (Helley et al., 1979). Based on field observations, the soils underlying the Site appear to be fine-grained alluvium, consistent with "Bay Mud." The alluvium has been described as unconsolidated plastic that is moderately to poorly sorted and clay that is rich in organic material (Helley et al., 1979).

The results of all quarterly groundwater monitoring events indicate that the groundwater flow direction beneath the Site is consistently toward the west with an average flow gradient of .009 ft/ft. Based on the available historical data gathered by Geo-Logic and SOMA, depth to groundwater in MW-1 ranges from 4.35 to 8.40 feet, and the depth to groundwater in MW-2 ranges from 4.21 to 8.70 feet. Reviewing lithologic logs of the groundwater monitoring wells indicates that the saturated sediments beneath the Site are comprised of clayey silt with occasional occurrence of fine sand. Assuming that hydraulic conductivity of the saturated material is about 5×10^{-5} cm/sec and its porosity is 0.40, then the estimated groundwater flow velocity is approximately 1.2 feet per year.

3.0 Field Activities

On September 19, 2000, SOMA's field crew conducted the third quarter 2000 groundwater monitoring event in accordance with the procedures and guidelines of the Regional Water Quality Control Board (RWQCB), San Francisco Bay Region. During this groundwater monitoring event, two groundwater monitoring wells (MW-1 and MW-2) were monitored. As discussed earlier, the off-site monitoring wells were

monitored by Geo Logic at the same time and date. The locations of the on-site and off-site monitoring wells are shown in Figure 2.

Depths to watertable were measured from the top of the casings to the nearest 0.01 foot using an electric sounder. No free product was detected in the monitoring wells. Before the samples were collected, each well was purged, by removing at least three casing volumes of groundwater. A battery operated 2-inch diameter pump was used to purge each well. A disposable bailer was used to collect sufficient samples from each monitoring well for laboratory analyses and field measurements. For laboratory analyses, the groundwater samples were transferred into two 40-ml VOA vials and a one liter glass container. The VOC vials and the one liter container were sealed properly to prevent the development of any air bubbles within the head-space area. For field measurements, a sufficient sample was transferred into a 0.5-liter polyethylene container. The samples were placed in an ice chest and delivered to Delta Environmental Laboratories for analyses of TPH-g, TPH-d, BTEX, and MTBE (using EPA Methods 8015M and 8020). MTBE results were confirmed with EPA Method 8260.

Electrical conductivity, pH and temperature were measured on-site with a Hydac Model 910 pH meter. The instrument was calibrated for conductance with a standard solution of known concentration (1,000 $\mu\text{s}/\text{cm}$), and for pH with 4, 7 and 10 pH unit buffer solutions. All measurements were performed according to the instruction manual provided by the manufacturer. Appendix 1 includes field measurements such as electrical conductivity, pH, water level measurements and other field notes during the monitoring event.

4.0 Results

Table 1 presents the measured depth to groundwater and the calculated static water levels at the off-site and on-site monitoring wells. At each groundwater monitoring

well, the depth to watertable and the elevation of the top of casing were used to calculate the static water levels.

Depths to watertable ranged from 8.19 feet in off-site monitoring well MW-3 to 9.91 feet in the off-site monitoring well MW-1A. The depth to water table in the on-site monitoring wells was 8.4 feet in MW-1 and 8.7 feet in MW-2

In general, the groundwater was found to flow in a westerly direction at an approximate gradient of 0.002 ft/ft, a slightly lower gradient than noted during previous monitoring events. Figure 3 displays the groundwater elevation contour map.

Table 2 presents the results of the chemical analyses of the water samples. TPH-g was only detected in the off-site monitoring well MW-2, with a concentration of 2,000 $\mu\text{g/l}$. The concentrations of TPH-g in the remainder of the wells were below the detection limit of 50 $\mu\text{g/l}$. Figure 4 displays the TPH-g concentration contour map. MTBE was not detected in the on-site well MW-2. MTBE was detected at a concentration of 180 $\mu\text{g/l}$ in the on-site monitoring well MW-1, and at concentrations of 13 $\mu\text{g/l}$ and 180 $\mu\text{g/l}$ in the off-site monitoring wells MW-1A and MW-2, respectively. Figure 6 displays the MTBE concentration contour map.

As Table 2 shows, elevated concentrations of TPH-d in groundwater was detected in MW-1 (43,100 $\mu\text{g/l}$) while, only small amounts of TPH-d was reported in MW-2 and off-site monitoring wells. Figure 5 displays the TPH-d concentration contour map. On-site, benzene was only detected in MW-1, at a concentration of 6.5 $\mu\text{g/l}$; off-site, benzene was only detected in MW-2, at a concentration of 210 $\mu\text{g/l}$. Ethylbenzene was detected in groundwater samples collected from both on-site and off-site monitoring wells MW-2. On-site, xylenes were detected in MW-1 and MW-2 at a

maximum concentration of 23 µg/l. Off-site xylenes were only detected in MW-2, at a concentration of 6 µg/l.

5.0 Conclusions

The results of the current groundwater monitoring events indicate that the groundwater flow direction is toward the west, which is consistent with the previous monitoring events. The results of the laboratory analyses on the groundwater samples indicate elevated levels of TPH-d in MW-1. However, in MW-2 and in the off-site monitoring wells located downgradient from MW-1, the concentration of TPH-d was low (330 µg/l).

As Table 2 indicates, for the second time MTBE was detected in the groundwater at a maximum concentration of 180 µg/l. The results of the recent monitoring event confirmed our previous findings that MTBE has impacted the groundwater. The results of the groundwater monitoring event indicated that the groundwater is also impacted with low levels of BTEX.

For cost saving purposes, the groundwater samples were not analyzed for SVOCs during this monitoring event. Bis (2-ethylhexyl) phthalate was the only SVOCs detected during the previous monitoring event. Generally, due to the low mobility of the SVOCs in groundwater it is not expected that SVOCs would migrate to off-site areas in foreseeable future. However, we are planning to include SVOCs analyses during the fourth quarter groundwater monitoring event.

6.0 References

Bradford, G.R., A.C. Chang, A.L. Page, D. Bakhtar, J.A. Frampton and H. Wright. Background Concentrations of Trace and Major Elements in California Soils. Department of Soil and Environmental Sciences, University of California, Riverside; Department of Toxic Substances Control (DTSC), California Environmental Protection Agency (Cal/EPA).

Cal/EPA 1994. California Cancer Potency Factors: Update. California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA).

DTSC 1994. Preliminary Endangerment Assessment Guidance Manual. California Environmental Protection Agency, Department of Toxic Substances Control (DTSC).

EPA 1991, Human Health Evaluation Manual, Supplemental Guidance: Standard Default Exposure Factors, OSWER Directive 9285.6-03.

Johnson, P.C. and R.A. Ettinger. (1991). Heuristic Model for Predicting the Intrusion Rate of Contaminant Vapors into Buildings. Environ. Sci. Technol. 25: 1445-1452.

Geo-Logic, August 14, 1997 "Phase I Environmental Site Assessment, Berkeley Farms, at Emeryville, 4550 and 4575 San Pablo Avenue, Emeryville, California 94608.

Geo-Logic, September 23, 1998, " Report of Soil and Groundwater During Removal of Fuel Tanks and Product Piping, Former Berkeley Farms Dairy Facility, 4550 San Pablo Avenue, Emeryville, California, 94608.

SOMA Environmental Engineering, Inc.

Geo-Logic, November 20, 1998, " Report of Additional Soil Sampling During Over-excavation of Former Fuel Tank Pit, Piping Trenches, and Dispenser Island, Former Berkeley Farms Dairy Facility, 4550 San Pablo Avenue, Emeryville, California, 94608.

Geo-Logic, March 18, 1999, " Installation of Monitoring Wells, Former Berkeley Farms Dairy Facility, 4550 San Pablo Avenue, Emeryville, California, 94608.

Geo-Logic, June 11, 1999, " Second Quarterly Sampling of Monitoring Wells, Former Berkeley Farms Dairy Facility, 4550 San Pablo Avenue, Emeryville, California, 94608.

Helley, et al., 1979, "Fatland Deposits – Their Geology and Engineering Properties and Their Importance to Comprehensive Planning" USGS Professional Paper 943.

TABLES

**Table 1: Water Table Elevations in the On-site and Off-site Monitoring Wells,
Measured September 19, 2000**

Monitoring Well	Casing Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)
<i>On-site</i>			
MW-1	42.03	8.40	33.63
MW-2	42.12	8.70	33.42
<i>Off-site</i>			
MW-1A	42.01	9.91	32.10
MW-2	40.78	8.74	32.04
MW-3	41.08	8.19	32.89

**Table 2: Laboratory Analysis Results of Groundwater Samples
4550 San Pablo Avenue, Emeryville, CA**

Well No.	TPH-g (µg/l)	TPH-d (µg/l)	Benzene (µg/l)	Toluene (µg/l)	Ethylbenzene (µg/l)	Xylene (µg/l)	MTBE (µg/l)
On-site							
MW-1	< 50	43,100	6.5	9.1	< 0.5	23	180
MW-2	< 50	90	< 0.5	1.9	4.9	12	< 5
Off-site							
MW-1A	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	13
MW-2	2000	330	210	8.7	5.5	6	180
MW-3	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 5

FIGURES

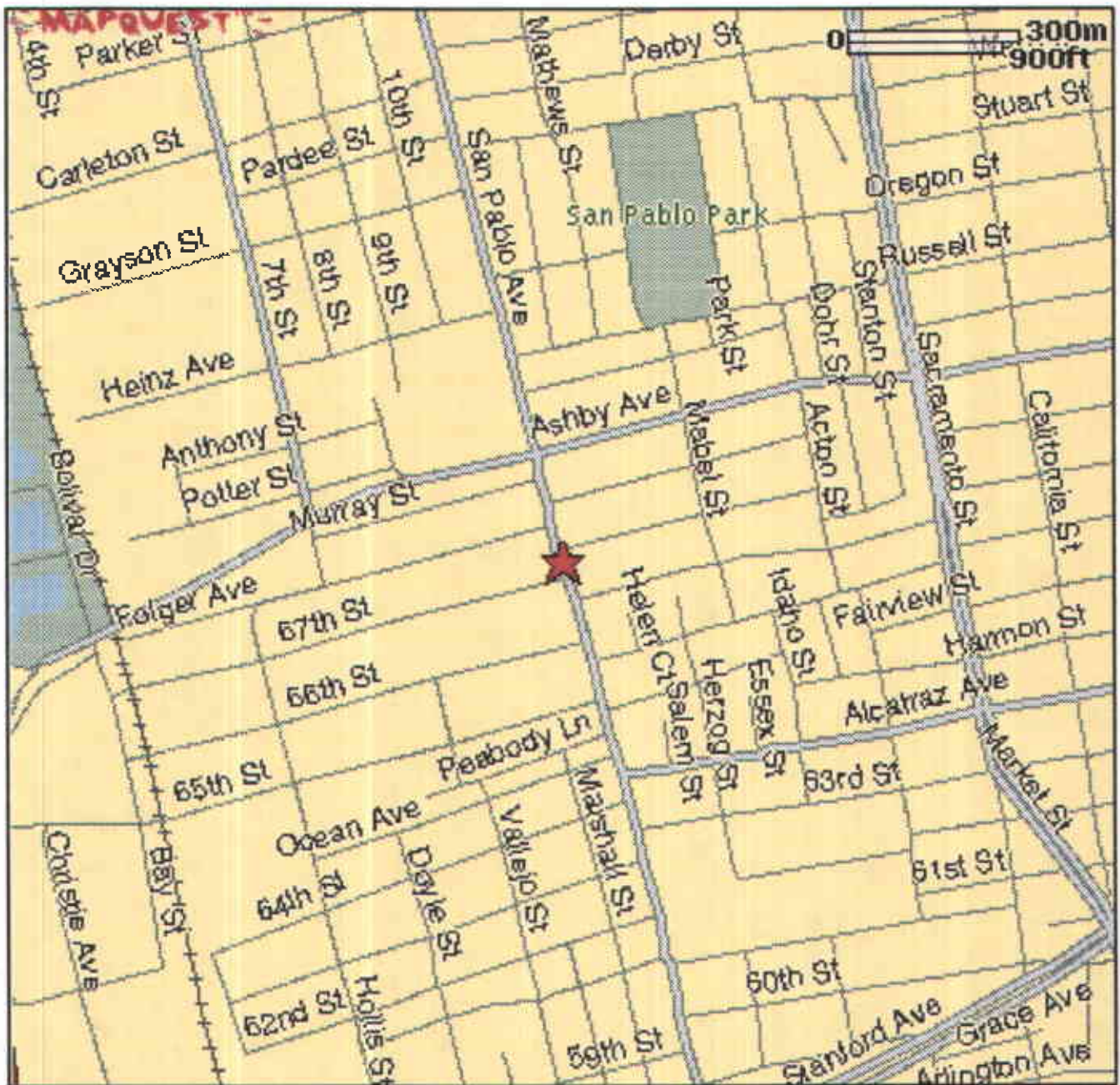


Figure 1: Site Vicinity Map



47th Street

Former Waste Oil Tank

MW-2Δ

Truck Repair Shop

MW-3Δ

San Pablo Avenue

Berkeley Farms Dairy Facility

MW-2Δ

MW-1Δ

Former USTs

45th Street

Former Tank Pit

MW-1AΔ

Δ Groundwater Monitoring Well

45th Street

scale in feet

0 100

Figure 2: Site Map Showing Locations of Groundwater Monitoring Wells



Former Waste Oil Tank

MW-2 Δ

San Pablo Avenue

47th Street

MW-3 Δ

MW-2 Δ

MW-1 Δ

Former USTs

45th Street

Former Tank Pit

MW-1A Δ

Δ Groundwater Monitoring Well

45th Street

scale in feet

0 100

Figure 3: Contour Map of Groundwater Elevations, September 19, 2000

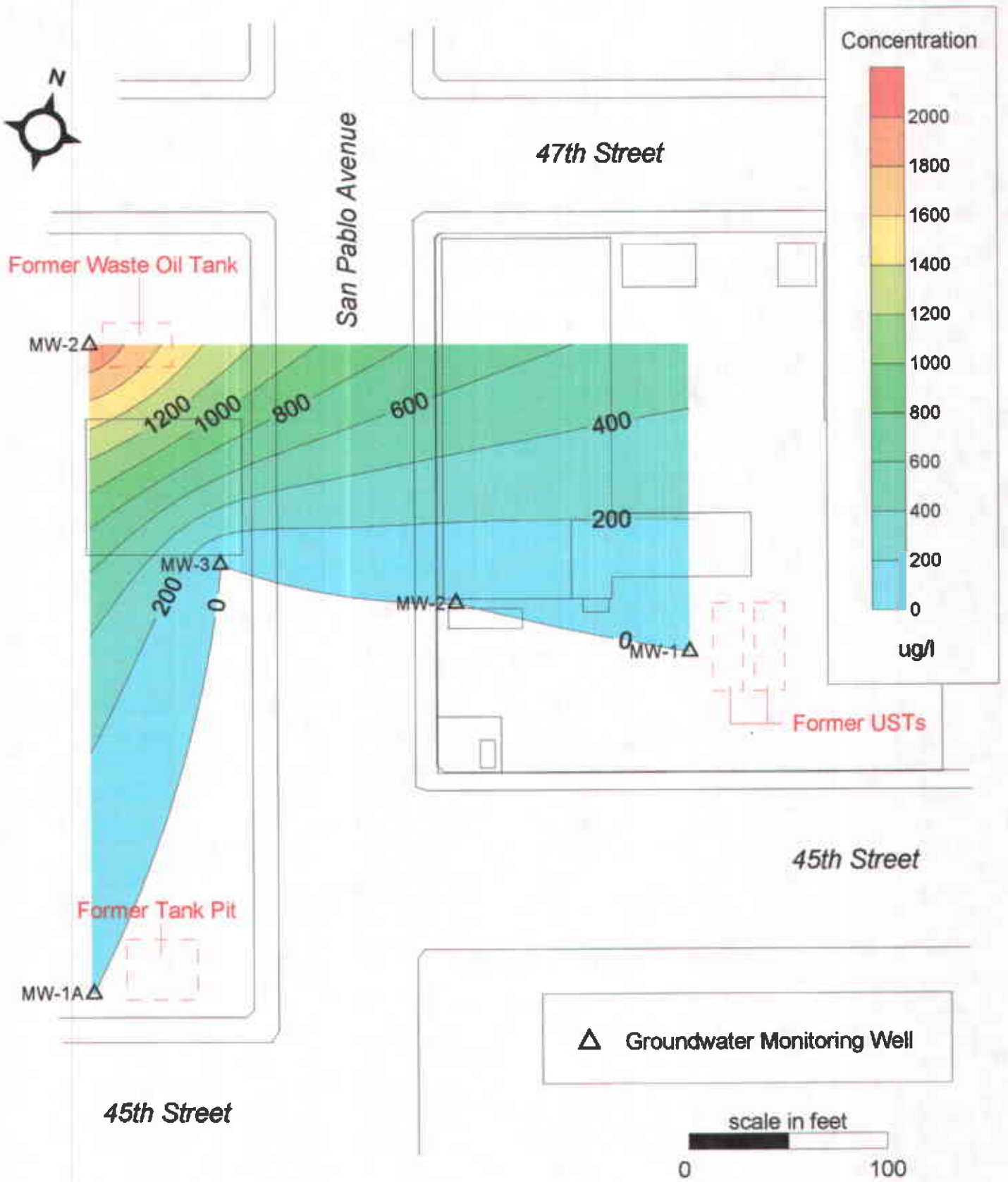


Figure 4: Contour Map of TPH-g Concentrations in Groundwater (ug/L), September 19, 2000

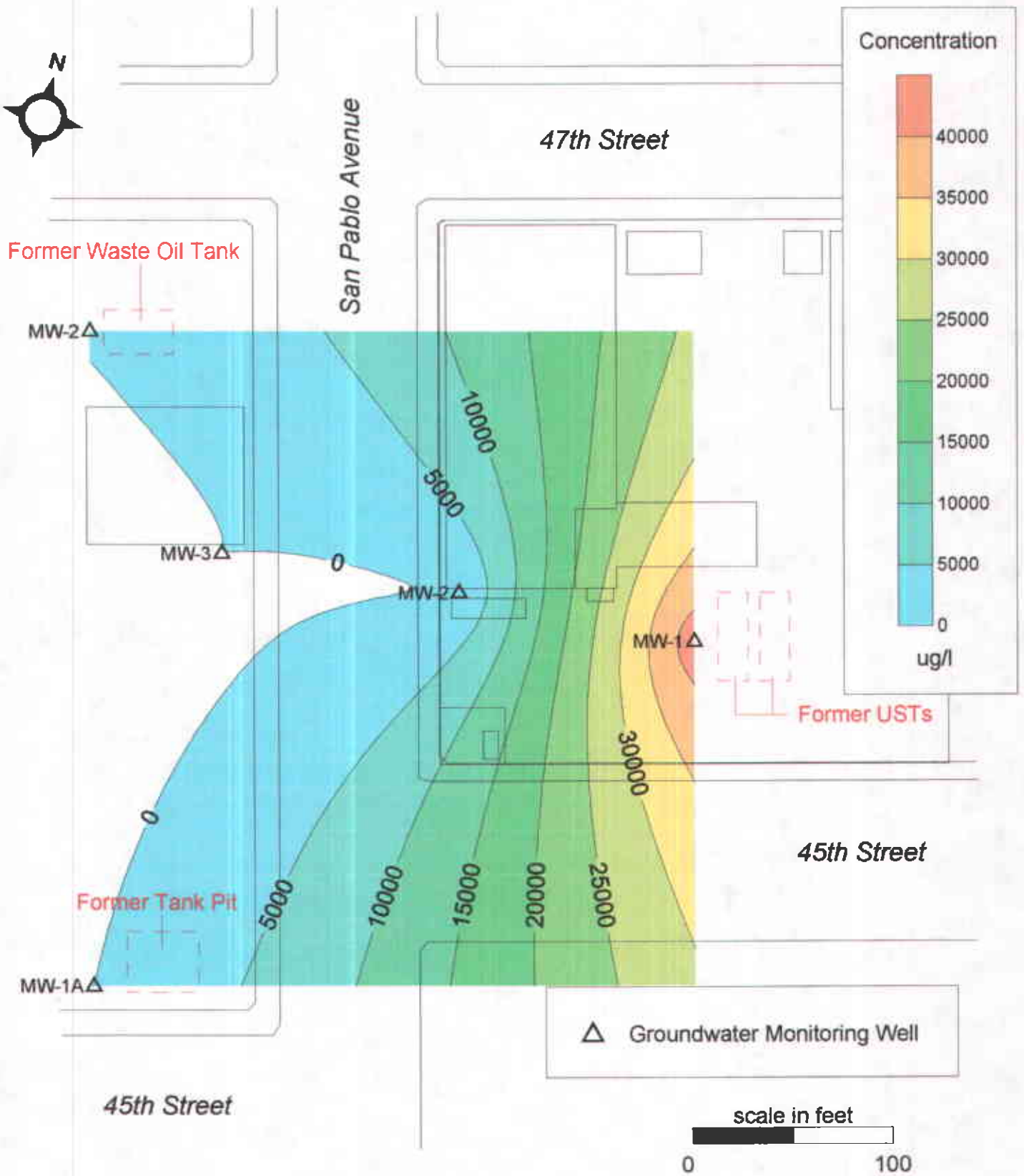


Figure 5: Contour Map of TPH-d Concentrations in Groundwater (ug/L), September 19, 2000

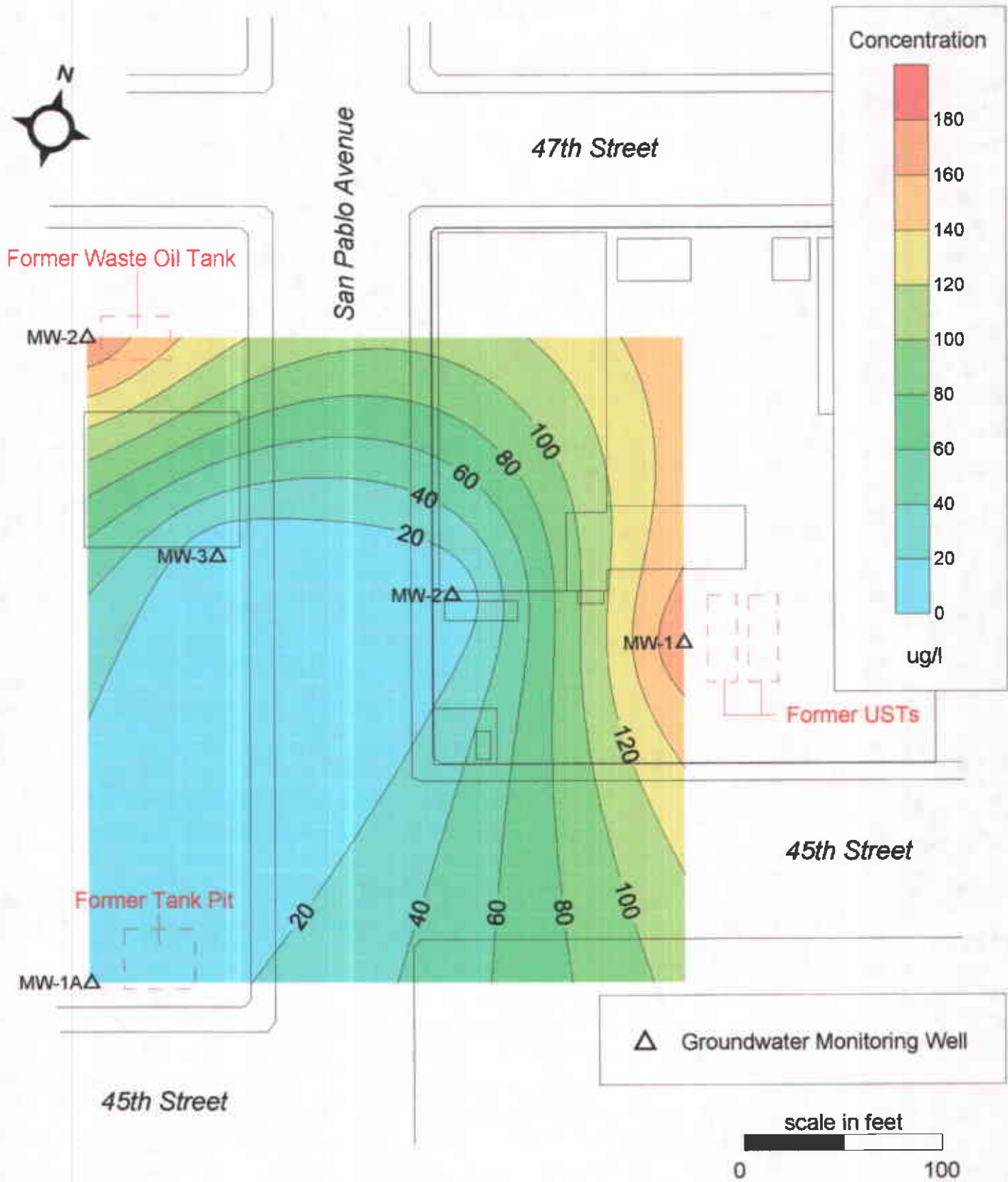


Figure 6: Contour Map of MTBE Concentrations in Groundwater (ug/L), September 19, 2000

APPENDIX 1

Field Notes



ENVIRONMENTAL ENGINEERING, INC

Well NO: MW-1 **Project NO:** 2370
Casing Diameter: 2 inch **Address:** Emeryville Farms Property
Depth of Well: 22.00 ft 4550 San Pablo Avenue
Elevation of the Casing: 42.03 ft Emeryville, California
Depth to Water Table: 8.40 ft **Date:** 09/19/2000
Elevation of Water Table: 33.63 ft **Sampler:** Naser Pakrou
Height of Water: 13.60 ft
Purged Volume: 6.00 Gallons

Purging Method: **Bailer** **Pump**

Sampling Method: **Bailer** **Pump**

Color: **Yes** **No** **Describe**

Sheen: **Yes** **No** **Describe**

Odor: **Yes** **No** **Describe**

Field Measurements

Time	pH	Temp °C	EC µs/cm
2:30	7.13	73.9	542



ENVIRONMENTAL ENGINEERING, INC

Well NO: MW-2 **Project NO:** 2370
Casing Diameter: 2 inch **Address:** Emeryville Farms Property
Depth of Well: 22.00 ft 4550 San Pablo Avenue
Elevation of the Casing: 42.12 ft Emeryville, California
Depth to Water Table: 8.70 ft **Date:** 09/19/2000
Elevation of Water Table: 33.42 ft **Sampler:** Naser Pakrou
Height of Water: 13.30 ft
Purged Volume: 6.00 Gallons

Purging Method: **Bailer** **Pump**

Sampling Method: **Bailer** **Pump**

Color: **Yes** **No** **Describe**

Sheen: **Yes** **No** **Describe**

Odor: **Yes** **No** **Describe**

Field Measurements

Time	pH	Temp °C	EC µs/cm
2:30	7.60	74.8	513

APPENDIX 2

**Laboratory Analytical
Reports and Chain of
Custody Forms**



WATER • WASTE WATER • HAZARDOUS WASTE • FUEL • AIR • SOIL

ENVIRONMENTAL LABORATORIES, Ltd

SOMA
2680 Bishop Drive, Suite 203
San Ramon, CA 94583

Client project ID:
Proj 2370
Berkeley Farms
Emeriville, CA

Ref.: R5289401
Method: 8015M
Sampled: 9/19/00
Received: 9/19/00
Matrix: Water
Analyzed: 9/21/00
Reported: 9/29/00
Analyst: DS
Units: mg/L

Attention: Dr. M Sepehr

Laboratory Results for TPH -Diesel Analysis

Analyte	EPA Method	Detection Limit mg/L	Results	
			Sample ID	
			MW-1	MW-2
TPH-Diesel	8015M	0.05	43.1 ✓	0.09 ✓

ND: Not Detected (<MDL)

Delta Environmental Laboratories

Hossein Khosh Khoo

Hossein Khosh Khoo, Ph.D.

DELTA

WATER • WASTE WATER • HAZARDOUS WASTE • FUEL • AIR • SOIL

ENVIRONMENTAL LABORATORIES, Ltd

SOMA
2680 Bishop Drive, Suite 203
San Ramon, CA 94583

Client project ID:
Proj 2370
Berkely Farms
Emeriville, CA

Ref.: R5289400
Method: 5030 GCFID/
8020/ 8260
Sampled: 9/19/00
Received: 9/19/00
Matrix: Water
Analyzed: 9/26/00
Reported: 9/29/00
Analyst: DS
Units: ug/L

Attention: Dr. M Sepehr

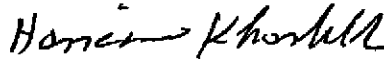
Laboratory Results for TPH + BTEX & MTBE Analysis

Analyte	EPA Method	Detection Limit ug/L	Results	
			Sample ID	
			MW-1	MW-2
BTEX				
Benzene	8020	0.5	6.5	ND
Toluene	8020	0.5	9.1	1.9
Ethylbenzene	8020	0.5	ND	4.8
Total-Xylene	8020	0.5	23	12
MTBE	8260	5.0	180*	ND*
TPH-g	5030/GCFID	50	ND	ND


ND: Not Detected (<MDL)

* The results reported for MTBE are confirmed values by GC/MS; EPA 8260.

Delta Environmental Laboratories



Hossein Khosh Khoo, Ph.D.

 McCAMPBELL ANALYTICAL INC.	110 2nd Avenue South, #D7, Pacheco, CA 94553-5560 Telephone : 925-798-1620 Fax : 925-798-1622 http://www.mccampbell.com E-mail: main@mccampbell.com

Geo Logic 1140 5 th Avenue Crockett, CA 94525	Client Project ID: #1113-02: Fror. Berkeley Farms/KFC	Date Sampled: 09/19/00
		Date Received: 09/19/00
	Client Contact: Joel Greger	Date Extracted: 09/19-09/21/00
	Client P.O:	Date Analyzed: 09/19-09/21/00

Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline*, with Methyl tert-Butyl Ether* & BTEX*
 EPA methods 5030, modified 8015, and 8020 or 602; California RWQCD (SF Bay Region) method GCFID(5930)

Lab ID	Client ID	Matrix	TPH(g)*	MTBE	Benzene	Toluene	Ethylben- zene	Xylenes	% Recovery Surrogate
47943	MW 1A	W	ND /	13 /	ND /	ND /	ND /	ND /	103
47944	MW 2	W	2000 _a /	180	210	8.7	5.5	6.0	116
47945	MW 3	W	ND /	NBD _a	ND /	ND /	ND	ND /	96
Reporting Limit unless otherwise stated: ND means not detected above the reporting limit	W		50 ug/L	5.0	0.5	0.5	0.5	0.5	
	S		1.0 mg/kg	0.05	0.005	0.005	0.005	0.005	

* water and vapor samples are reported in ug/l., wipe samples in ug/wipe, soil and sludge samples in mg/kg, and all TCLP and SPLP extracts in ug/L

* clustered chromatogram, sample peak coelutes with surrogate peak

The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant (aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (?); f) one to a few isolated peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen is present; i) liquid sample that contains greater than ~5 vol. % sediment; j) no recognizable pattern.

DHS Certification No. 1644

 Edward Hamilton, Lab Director

