

File No. 8-90-420-GI

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QUARTERLY GROUNDWATER SAMPLING
FOR THE PROPERTY
LOCATED AT 5175 BROADWAY STREET
OAKLAND, CALIFORNIA
NOVEMBER 22, 1991

PREPARED FOR:
MR. MOHAMMAD MEHDIZADEH
150 RANDOM WAY
PLEASANT HILL, CALIFORNIA 94523

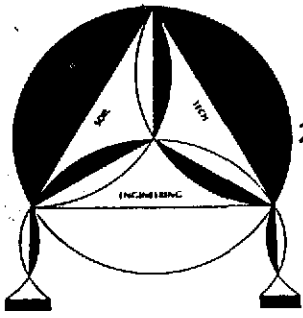
BY:
SOIL TECH ENGINEERING, INC.
298 BROKAW ROAD
SANTA CLARA, CALIFORNIA 95050

SOIL TECH ENGINEERING, INC.

TABLE OF CONTENTS

Page No.

LETTER OF TRANSMITTAL	1-2
BACKGROUND	3
Tank Removal and Sampling	3
Additional Monitoring and Sampling	4
Additional Subsurface Investigation	5-6
CURRENT FIELD WORK	6
LABORATORY ANALYSIS	6
LABORATORY RESULTS	7
SUMMARY	7
RECOMMENDATIONS	7-8
SCHEDULE	8
LIMITATIONS	8
TABLE 1 - SUMMARY OF THE GROUNDWATER MONITORING WELLS	9
TABLE 2 - SUMMARY OF GROUNDWATER ANALYTICAL RESULTS	10
APPENDIX "A"	
Figure 1 - Vicinity Map	11
Figure 2 - Site Plan	12
APPENDIX "B"	
Groundwater Sampling	13
APPENDIX "C"	
ChromaLab, Inc. Report with Chain-of-Custody	



SOIL TECH ENGINEERING

Soil, Foundation and Geological Engineers

298 BROKAW ROAD, SANTA CLARA, CA 95050 ■ (408) 496-0265 OR (408) 496-0266

November 22, 1991

File No. 8-90-420-GI

Mr. Mohammad Mehdizadeh
150 Random Way
Pleasant Hill, California 94523

Reference: Quarterly Groundwater Sampling for the Site
Located at 5175 Broadway Street, in
Oakland, California

Dear Mr. Mehdizadeh:

This report presents the results of the quarterly groundwater sampling performed during November 1991, by Soil Tech Engineering, Inc. (STE), at the subject site located at 5175 Broadway Street, in Oakland, California (Figure 1).

As requested, the following work was performed:

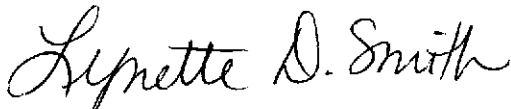
- 1) Measured depth-to-groundwater and liquid-hydrocarbon thickness (if present) in the five on-site wells.
- 2) Collected groundwater samples from the on-site wells for analysis of Total Petroleum Hydrocarbons as gasoline (TPHg) and Hydrocarbon constituents, Benzene, Toluene, Ethylbenzene and Total Xylenes (BTEX).

- 3) Updated the database for water level/liquid-hydrocarbon level measurements and groundwater chemistry data.
- 4) Reviewed results and prepared a report of the investigation.

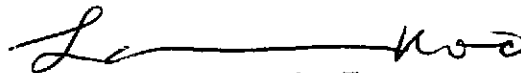
If you have any questions or require additional information, please feel free to contact our office at your convenience.

Sincerely,

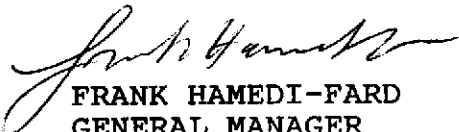
SOIL TECH ENGINEERING, INC.



LYNETTE SMITH
ENVIRONMENTAL EDITOR



LAWRENCE KOO, P. E.
C. E. #34928



FRANK HAMEDI-FARD
GENERAL MANAGER

BACKGROUND:

The site is located in a residential and light retail district (Figure 1).

Tank Removal and Sampling:

In January 1990, Tank Protect Engineering, Inc. (TPE), was retained to supervise the removal of three 8,000 gallon underground gasoline tanks and one 500 gallon waste oil tank, to conduct soil sampling, soil excavation, soil treatment, soil disposal and to install three monitoring wells.

Initial analytical results of soil samples taken after the tank removal showed moderate levels of Total Petroleum Hydrocarbons as Gasoline (TPHg) in two locations. The rest of the samples showed TPHg ranging from non-detected to less than 120 parts per million (ppm). Due to the presence of TPHg noted in the excavation, TPE installed three monitoring wells (MW-1 to MW-3) on-site, as required by state and local regulatory agencies (Figure 2). TPE's preliminary groundwater assessment indicated that the shallow groundwater had been impacted. Therefore, TPE treated the excavated soil to acceptable levels, according to County Health guidelines, to be re-used in the excavation.

The Alameda County Health Department (ACHD) requested the property owner to conduct further investigation in order to define the extent of dissolved hydrocarbon contamination in the groundwater.

Additional Monitoring and Sampling:

Soil Tech Engineering, Inc. (STE), was retained in September 1990 to conduct monitoring and sampling of the on-site monitoring wells. The objective of the quarterly groundwater sampling program was to monitor seasonal and long-term variations in the conditions of the shallow aquifer beneath the site and to assess the direction of the groundwater flow for further investigation.

STE sampled the three on-site groundwater monitoring wells (MW-1 to MW-3) on September 26, 1990, and January 14, 1991. The sampling was conducted in accordance with ACHD and California Regional Water Quality Control Board (CRWQCB) guidelines and our Standard Operating Procedures detailed in Appendix "B".

The three on-site wells contained moderate to high levels of dissolved hydrocarbons. A comparison of the September 1990 sampling with TPE's analytical results of April 1990 showed an increase in dissolved hydrocarbons in wells MW-1 and MW-2. In well MW-3 (the down-gradient well), TPHg and Toluene levels decreased, whereas Benzene, Ethylbenzene and Total Xylenes increased slightly.

The analytical results for groundwater samples collected on January 14, 1991, showed an increase in TPH and BTEX levels in well MW-2 from those reported in September 1990. Well MW-1 also showed a slight increase in TPH and Benzene, but showed a decrease in Toluene, Ethylbenzene and Xylene levels. Well MW-3 showed a substantial decrease in TPH and BTEX.

Additional Subsurface Investigation:

Per the request of the Alameda County Health Department (ACHD) in a letter dated March 29, 1991, STE installed two additional monitoring wells STMW-1 (STMW-4) and STMW-2 (STMW-5) on June 21, 1991. STE staff collected soil and groundwater samples.

The July 3, 1991, water sampling results showed low levels of dissolved Total Petroleum Hydrocarbons as gasoline (TPHg) and Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) in all five wells. The presence of low levels of TPHg and BTEX in the up-gradient well, STMW-1 (STMW-4), (located in the east corner of the property) indicated a potential off-site source. Based on the water level data, the groundwater direction was west to southwest on July 3, 1991.

A comparison of the July 1991 analytical results of existing on-site wells (MW-1 to MW-3) with the September 1990 results showed substantial decreases in the concentrations of TPHg in wells MW-1 and MW-3, but an increase in TPHg levels in well MW-2.

The concentrations of dissolved hydrocarbons in the down-gradient well, STMW-2 (STMW-5), were several-fold less than the concentrations of dissolved hydrocarbons in well MW-3, which is located approximately 25 feet up-gradient. This indicated that the concentrations had decreased in the down-gradient well, so the

contamination might not migrate beyond the south property boundary. Subsequent quarterly monitoring should provide more data to substantiate our assumptions about lateral migration and a potential off-site source.

CURRENT FIELD WORK:

On November 11, 1991, the five on-site wells were purged, monitored, and sampled in accordance with STE's Standard Operating Procedures (Appendix "B"), which follow state and local guidelines. During field observation, STE staff detected mild petroleum odors in wells MW-1, MW-2 and STMW-5. They also found light petroleum sheen and mild to strong petroleum odors in wells MW-3 and STMW-4.

Based on water elevation data, the groundwater flow direction was west on November 11, 1991.

LABORATORY ANALYSIS:

The water samples were placed in a cool ice chest and sent to Chromalab, Inc., a state-certified laboratory, with a chain-of-custody record attached (Appendix "C").

The samples were analyzed for Total Petroleum Hydrocarbons as gasoline (TPHg) per EPA Method 5030/8015 and for Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) per EPA Method 602.

LABORATORY RESULTS:

Low to moderate levels of TPHg were detected in all five wells, ranging from 0.33 parts per million (ppm) to 57 ppm. Low levels of BTEX were also found in all five wells.

SUMMARY:

The analytical results of groundwater samples collected in November 1991 indicate that TPHg levels decreased in wells MW-1, MW-2, and STMW-5 compared to those previously reported for July 1991. In well MW-3, TPHg increased from 33 to 57 ppm. Toluene, Ethylbenzene and Xylenes also increased, while Benzene decreased slightly. In well STMW-4, TPHg, Benzene, and Xylenes levels increased slightly, but Toluene and Ethylbenzene decreased.

These levels may be because of residual soil contamination left in the ground. Recent results indicate continued hydrocarbon contamination on-site. It is not known whether the increased concentrations in the wells are due to seasonal effects or due to the off-site source. Sampling during the next two scheduled quarterly samplings should provide better information regarding hydrocarbon trends.

RECOMMENDATIONS:

Since dissolved hydrocarbons continue to be present in the wells and have increased in one well, STE recommends the continuation of the monitoring and sampling of the five wells for

the next two quarters. The proposed monitoring and sampling program should then be re-evaluated following the fourth quarterly sampling.

A copy of this report should be sent to the Alameda County Health Department and the California Regional Water Quality Control Board.

SCHEDULE:

The next monitoring and sampling of the wells will be scheduled in February 1992.

LIMITATIONS:

This report is issued with the understanding that it is the responsibility of the owner or his representative to ensure that the information and recommendations contained herein are called to the attention of the Local Environmental Agencies.

The findings of this report are based on the results of the independent laboratory analyses and are valid at the present date and conditions. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural processes or the works of man, on this property or adjacent properties.

**TABLE 1
SUMMARY OF THE
GROUNDWATER MONITORING WELLS**

Date	Well No.	Water* Depth (feet)	Product Thickness (feet)	Odor
5/17/90**	MW-1	9.26	NA	NA
	MW-2	10.00	NA	NA
	MW-3	12.42	NA	NA
9/26/90	MW-1	9.92	NP	Mild
	MW-2	10.83	NP	Mild
	MW-3	13.50	NP	Mild
1/14/91	MW-1	9.54	NP	Mild
	MW-2	10.63	NP	None
	MW-3	12.58	Light Sheen	None
7/03/91	MW-1	9.417	NP	Light
	MW-2	10.083	NP	Light
	MW-3	12.083	Sheen	Strong
	STMW-1	11.00	Sheen	Mild
	STMW-2	13.917	NP	None
11/11/91	MW-1	9.45	NP	Mild
	MW-2	10.21	NP	Mild
	MW-3	12.29	Light Sheen	Mild
	STMW-4***	11.08	Light Sheen	Strong
	STMW-5****	14.00	NP	Light

* = Below Ground Surface
 ** = Measured by TPE
 *** = STMW-4 is the same well as STMW-1.
 **** = STMW-5 is the same well as STMW-2.
 NP = None Present
 NA = Not Available

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS
IN
PARTS PER MILLION (ppm)

Date	Well No.	TPHg	B	T	E	X
4/30/89*	MW-1	0.2	0.018	0.005	0.002	0.012
	MW-2	0.23	0.039	0.018	0.005	0.023
	MW-3	56	3.6	8.6	1.3	7.2
9/26/90	MW-1	1.3	0.055	0.031	0.12	0.1
	MW-2	0.85	0.094	0.005	0.025	0.047
	MW-3	54	5.1	0.42	1.6	8.0
1/14/91	MW-1	1.7	0.057	0.028	0.041	0.053
	MW-2	3.1	0.35	0.083	0.086	0.13
	MW-3	35	2.6	6.6	1.5	5.7
7/03/91	MW-1	0.58	0.032	0.041	0.04	0.055
	MW-2	1.5	0.3	0.052	0.024	0.034
	MW-3	33	4.1	4.3	1.4	4.8
	STMW-1**	3.1	0.61	0.062	0.039	0.15
	STMW-2**	0.69	0.099	0.081	0.019	0.098
11/11/91	MW-1	0.33	0.02	0.002	0.002	0.011
	MW-2	0.96	0.32	0.015	0.004	0.029
	MW-3	57	3.9	8.4	2.1	14
	STMW-4***	3.6	0.99	0.015	0.003	0.18
	STMW-5****	0.41	0.061	0.002	0.001	0.02

TPHg = Total Petroleum Hydrocarbons as gasoline

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes

* = Analytical Results from TPE Site Assessment

** = Soil Tech Engineering, Inc., Monitoring Wells

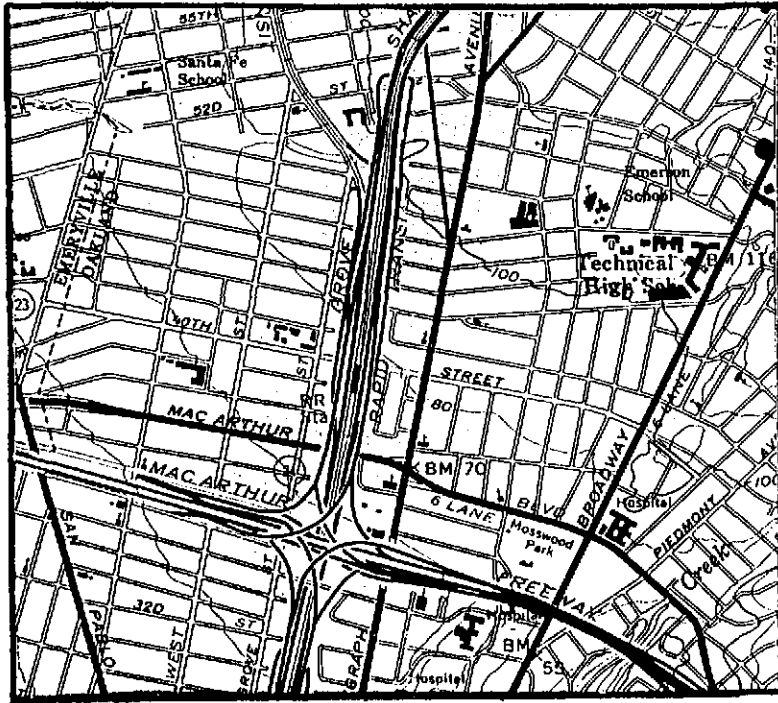
*** = STMW-4 is the same well as STMW-1.

**** = STMW-5 is the same well as STMW-2.

File No. 8-90-420-GI

A P P E N D I X "A"

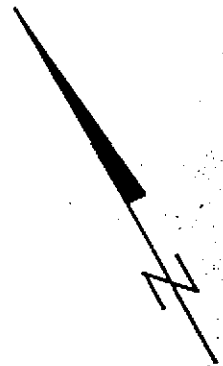
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Site
Location



USGS 7.5 Minute Series
Oakland West Quadrangle
© 1980



STREET
FLOW LINE

⊙ EXISTING MONITORING WELL

5175 BROADWAY OAKLAND CA

1" = 20'	PROJECT NO 8-90-420GI	FIG-2
DRAWN BY N.A.		11-11-91
SOIL TECH ENGINEERING INC. 298 BROKAW RD. SANTA CLARA CA 95050		

File No. 8-90-420-GI

A P P E N D I X "B"

SOIL TECH ENGINEERING, INC.

GROUNDWATER SAMPLING

Prior to collection of groundwater samples, all of the sampling equipment (i.e. bailer, cables, bladder pump, discharge lines and etc...) was cleaned by pumping TSP water solution followed by distilled water.

Prior to purging, the well "Water Sampling Field Survey Forms" were filled out (depth to water and total depth of water column were measured and recorded). The well was then bailed or pumped to remove four to ten well volumes or until the discharged water temperature, conductivity and pH stabilized. "Stabilized" is defined as three consecutive readings within 15% of one another.

The groundwater sample was collected when the water level in the well recovered to 80% of its static level.

Forty milliliter (ml.), glass volatile organic analysis (VOA) vials with Teflon septa were used as sample containers. The groundwater sample was decanted into each VOA vial in such a manner that there was a meniscus at the top. The cap was quickly placed over the top of the vial and securely tightened. The VOA vial was then inverted and tapped to see if air bubbles were present. If none were present, the sample was labeled and refrigerated for delivery under chain-of-custody to the laboratory. The label information would include a sample identification number, job identification number, date, time, type of analysis requested, and the sampler's name.

File No. 8-90-420-GI

A P P E N D I X "C"

SOIL TECH ENGINEERING, INC.

CHROMALAB, INC.

5 DAYS TURNAROUND

Analytical Laboratory (E694)

November 19, 1991

ChromaLab File No.: 1191112

SOIL TECH ENGINEERING

Attn: Diep Nguyen

RE: Five water samples for Gasoline/BTEX analysis

Project Name: 5175 BROADWAY ST.- OAKLAND

Project Number: 8-900-420-GI

Date Sampled: Nov. 11, 1991

Date Submitted: Nov. 12, 1991

Date Extracted: Nov. 15, 1991

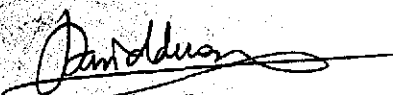
Date Analyzed: Nov. 15, 1991

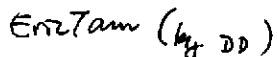
RESULTS:

Sample I.D.	Gasoline (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl Benzene (ug/l)	Total Xylenes (ug/l)
MW-1	330	20	1.7	1.5	11
MW-2	960	320	15	4.1	29
MW-3	57000	3900	8400	2100	14000
STMW-4	3600	990	15	2.6	180
STMW-5	410	61	2.4	1.4	20

BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	93.8%	85.7%	93.9%	100.8%	106.6%
DUP SPIKE REC.	91.5%	85.4%	88.9%	90.3%	93.8%
DETECTION LIMIT	50	0.5	0.5	0.5	0.5
METHOD OF ANALYSIS	5030/ 8015	602	602	602	602

ChromaLab, Inc.


David Duong
Chief Chemist


Eric Tam
Laboratory Director

CHAIN OF CUSTODY RECORD

CHROMA

PROJ. NO. 8-90-420-31 NAME 5175 Broadway St. Oakland

ANALYSES REQUESTED @ TAP Hg/BTEX

CHROMALAB FILE # 1191112 ORDER # 4144

SAMPLERS: (Signature) [Signature]

NO.	DATE	TIME	SOIL	WATER	LOCATION	CON-TAINER
1	11/1/91	13 ⁰⁰		✓	MW-1	3
2	11/1/91	13 ³⁰		✓	MW-2	3
3	11/1/91	13 ⁴⁵		✓	MW-3	3
4	11/1/91	14 ³⁰		✓	STMW-4	3
5	11/1/91	15 ⁰⁰		✓	STMW-5	3

Relinquished by: (Signature) <i>Deep Nguyen</i>	Date / Time 11/12/91 10:47	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
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Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
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Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature) <i>[Signature]</i>	Date / Time 11/12/91 1047	Remarks N.T.A.
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SOIL TECH ENGINEERING

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CHAIN OF CUSTODY RECORD

CHROMA

PROJ. NO. 8-90-420-GJ		NAME 5175 Broadway St. Oakland				CON-TAINER	ANALYSES REQUESTED BY TPHG/BTEXX					REMARKS	
SAMPLERS: (Signature) <i>[Signature]</i>													
NO.	DATE	TIME	SOIL	WATER	LOCATION								
1	11/1/91	13 ⁰⁰	✓	✓	MW-1	3	✓						
2	11/1/91	13 ³⁰	✓	✓	MW-2	3	✓						
3	11/1/91	13 ⁴⁵	✓	✓	MW-3	3	✓						
4	11/1/91	14 ³⁰	✓	✓	STMW-4	3	✓						
5	11/1/91	15 ⁰⁰	✓	✓	STMW-5	3	✓						
Relinquished by: (Signature) <i>Diep Nguyen</i>		Date / Time 11/12/91 10:47		Received by: (Signature)			Relinquished by: (Signature)		Date / Time		Received by: (Signature)		
Relinquished by: (Signature)		Date / Time		Received by: (Signature)			Relinquished by: (Signature)		Date / Time		Received by: (Signature)		
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature) <i>[Signature]</i>			Date / Time 11/12/91 1047		Remarks N.T.A.				



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