

James P. Bowers, PE
R. William Rudolph, Jr., PE

September 8, 1992
SCI 430.010

92 SEP 10 PM 1:09

Ms. Jennifer Eberle
Alameda County Health Care Services Agency
80 Swan Way, Room 200
Oakland, California 94621

3623

**Quarterly Groundwater Monitoring
Gasoline Contamination**
1330 Martin Luther King Jr. Way
Oakland, California

Dear Ms. Eberle:

This letter presents quarterly groundwater monitoring results for the referenced site. Groundwater monitoring has been performed as a result of an underground gasoline tank release. Subsurface Consultants, Inc. (SCI) has been providing consulting services for this project since 1989. The location of the site is presented on Plate 1.

Contaminated soil and groundwater resulting from the gasoline release is presently being remediated. Site remediation consists of (1) vapor extraction, and (2) groundwater extraction and treatment. The vapor extraction system has removed all measurable free product in the area. The groundwater extraction system has significantly lowered dissolved product concentrations and reduced the extent of the dissolved product plume. Vapor extraction and groundwater treatment are ongoing.

The groundwater monitoring events consist of (1) measuring groundwater levels and free product thicknesses, (2) purging water from each well until pH, conductivity and temperature have stabilized, and (3) sampling the wells with pre-cleaned disposable samplers. The samples were retained in glass containers and preserved with hydrochloric acid. The containers were placed in an ice filled cooler and remained iced until delivery to the analytical laboratory. Chain-of-custody documents accompanied the samples to the laboratory.

Analytical testing was performed by Curtis & Tompkins, Ltd., a State of California Department of Health Services certified

Subsurface Consultants, Inc.

171 12th Street • Suite 201 • Oakland, California 94607 • Telephone 510-268-0461 • FAX 510-268-0137

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laboratory for hazardous waste and water testing. The analytical tests included:

1. *TPH-g* Total volatile hydrocarbons (TVH), sample preparation and analysis using EPA Methods 5030 (purge and trap) and 8015 modified (gas chromatograph coupled to a flame ionization detector), and
2. *BTEX* Benzene, toluene, xylenes and ethylbenzene (BTXE), sample preparation and analysis using EPA Methods 5030 and 8020 (gas chromatograph coupled to a flame ionization detector).

A summary of the current and previous analytical test results and groundwater elevation data are presented in the attached Tables 1 and 2. Analytical test reports and chain-of-custody documents are also attached.

Conclusions

The groundwater level data indicate that the regional groundwater flow direction is toward the west-northwest at a gradient of approximately 1 percent. This groundwater flow direction and gradient remain consistent with previous measurements. However, locally groundwater is flowing toward the extraction wells shown on Plate 1.

In general, the analytical test results indicate that dissolved hydrocarbon concentrations in groundwater are continuing to decline. Groundwater monitoring will continue on a quarterly basis.

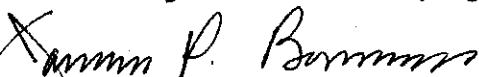
If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.



Sean O. Carson
Civil Engineer 45074 (expires 3/31/94)



James P. Bowers
Geotechnical Engineer 157 (expires 3/31/95)

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SOC:JPB:egh

Attachments: Table 1. - Contaminant Concentrations in Groundwater
Table 2. - Groundwater Elevation Data
Plate 1. - Site Plan
Analytical Test Reports
Chain-of-Custody Documents

cc: Mr. Eddy So
Regional Water Quality Control Board
2101 Webster Street, Room 500
Oakland, California 94612

Ms. Lois Parr
Oakland Redevelopment Agency
1333 Broadway, Suite 900
Oakland, California 94612

Ms. Julie Carver
City of Oakland
Environmental Affairs Division
1333 Broadway, Suite 800
Oakland, California 94612

Mr. John Esposito
Bramalea Pacific
1111 Broadway, Suite 1400
Oakland, California 94607

Mr. Donnell Choy
City of Oakland
905 14th Street, 12th Floor
Oakland, California 94612

Table 1. Contaminant Concentrations In Groundwater

Test Boring	Sample Date	TVH ¹ (ug/L) ⁵	B ² (ug/L)	T ² (ug/L)	X ² (ug/L)	E ² (ug/L)	Total Organic Lead (ug/L)	EDB ³ (ug/L)	1,2 DCA ⁴ (ug/L)
11	07/05/88	10,000	1,800	ND ⁵	1,200	ND	-- ⁶	--	--
	04/03/89	53,000	7,100	4,000	2,400	380	--	--	--
	07/06/89	22,000	5,300	3,200	2,300	390	ND	26	--
	11/08/89	120,000	18,000	8,000	21,000	4,500	ND	37	--
	07/18/90	26,000	950	19	98	ND	--	--	--
	10/23/90	4,200	1,600	8.5	170	28	--	0.2	--
	01/21/91	1,900	600	6.2	84	60	--	0.15	--
	04/24/91	4,800	1,100	3.5	46	120	--	--	--
	07/24/91	950	330	0.9	1.8	12	--	--	--
	10/24/91	970	350	1.6	1.6	14	--	ND	--
	01/23/92	ND	ND	ND	ND	ND	--	--	--
	05/01/92	340	77	0.6	0.6	ND	--	--	--
	08/06/92	220 ✓	54 ✓	ND ✓	ND ✓	ND ✓	--	--	--
28	09/02/88	890	431	75.4	84	ND	ND	9.2	--
	07/06/89	13,000	4,900	1,500	1,300	100	ND	27	--
29	09/02/88	ND	ND	8.1	ND	ND	ND	ND	--
	04/03/89	450	ND	2.0	6.7	2.0	--	--	--
	07/06/89	ND	ND	15	ND	ND	ND	ND	--
	11/08/89	780	ND	14	32	7.9	ND	ND	--
	10/23/90	1,800	1.2	6.5	4.8	2.7	--	--	--
	01/21/91	1,100	ND	3.7	4.9	1.3	--	ND	--
03/28/91	500	ND	1.6	0.8	ND	--	--	--	
31	09/02/88	ND	ND	ND	ND	ND	ND	ND	--
	04/03/89	ND	ND	ND	ND	ND	--	--	--
	07/06/89	ND	ND	ND	ND	ND	ND	ND	--
	11/08/89	ND	ND	ND	ND	ND	ND	ND	--
	07/18/90	ND	ND	ND	ND	ND	--	--	--
	01/21/91	ND	ND	0.6	2.1	ND	--	ND	--
	04/24/91	ND	ND	ND	ND	ND	--	--	--
	07/24/91	ND	ND	ND	ND	ND	--	--	--
	10/24/91	ND	ND	ND	ND	ND	--	--	--
	01/23/92	ND	ND	ND	ND	ND	--	--	--
	05/01/92	ND	ND	ND	ND	ND	--	--	--
08/07/92	ND ✓	ND ✓	ND ✓	ND ✓	ND ✓	--	--	--	
32	10/23/90	48,000	7,600	8,200	5,600	150	--	3.8	--
	01/21/91	96,000	9,600	15,000	16,000	2,000	--	ND	--
	04/24/91	170	ND	ND	ND	ND	--	--	--

Table 1. Contaminant Concentrations In Groundwater (continued)

Test Boring	Sample Date	TVH ¹ (ug/L) ⁵	B ² (ug/L)	T ² (ug/L)	X ² (ug/L)	E ² (ug/L)	Total Organic Lead (ug/L)	EDB ³ (ug/L)	1,2 DCA ⁴ (ug/L)
39	04/03/89	2,000	250	11	210	ND	--	--	--
	07/06/89	7,900	2,700	1,300	860	97	ND	3.0	--
	11/08/89	9,300	4,500	760	310	150	ND	4.0	36
	07/18/90	ND	4.1	ND	ND	ND	--	--	--
	10/23/90	160	12	6.4	5.0	ND	--	ND	ND
	01/21/90	200	23	0.9	2.0	1.2	--	ND	--
	03/28/91	ND	ND	ND	ND	ND	--	--	--
	04/24/91	ND	ND	ND	ND	ND	--	--	--
	07/24/91	ND	1.4	ND	ND	ND	--	--	--
	10/24/91	ND	ND	ND	ND	ND	--	ND	--
	01/23/92	ND	ND	ND	ND	ND	--	--	--
	05/01/92	ND	ND	ND	ND	ND	--	--	--
08/07/92	ND✓	ND✓	ND✓	ND✓	ND✓	--	--	--	
42	07/06/89	13,000	4,500	100	1,000	ND	ND	8.0	--
	10/23/90	8,800	420	580	910	91	--	0.7	--
	07/24/91	21,000	2,200	300	650	180	--	--	--
	10/24/91	18,000	2,300	1,100	1,000	260	--	16	--
	01/23/92	10,000	1,100	280	430	300	--	--	--
	05/01/92	16,000	1,200	330	580	220	--	--	--
	08/07/92	12,000✓	890✓	510✓	1,000✓	340✓	--	--	--
43	10/24/91	6,300	ND	ND	130	9.1	--	--	--
	05/01/92	930	ND	ND	3.8	ND	--	--	--
	08/07/92	450✓	ND✓	2.4✓	3.5✓	1.5✓	--	--	--
45	12/05/89	ND	ND	ND	ND	ND	ND	ND	--
	10/23/90	ND	0.9	1.4	1.8	ND	--	--	--
	01/21/91	ND	ND	ND	ND	ND	--	ND	--
	04/24/91	ND	ND	ND	ND	ND	--	--	--
	07/24/91	ND	ND	ND	ND	ND	--	--	--
	10/24/91	ND	ND	ND	ND	ND	--	--	--
	01/24/92	ND	ND	ND	ND	ND	--	--	--
	05/01/92	ND	ND	ND	ND	ND	--	--	--
08/06/92	ND✓	ND✓	ND✓	ND✓	ND✓	--	--	--	
46	11/30/89	ND	2.1	1.9	2.0	ND	ND	ND	--
	07/18/90	ND	ND	ND	ND	ND	--	--	--
	10/23/90	ND	ND	0.6	ND	0.5	--	--	--
	01/21/91	ND	ND	ND	ND	ND	--	ND	--
	04/24/91	ND	ND	ND	ND	ND	--	--	--
	07/24/91	ND	ND	ND	ND	ND	--	--	--
	10/24/91	ND	ND	ND	ND	ND	--	--	--

Table 1. Contaminant Concentrations In Groundwater (continued)

Test Boring	Sample Date	TVH ¹ (ug/L) ⁵	B ² (ug/L)	T ² (ug/L)	X ² (ug/L)	E ² (ug/L)	Total Organic Lead (ug/L)	EDB ³ (ug/L)	1,2 DCA ⁴ (ug/L)
58	01/30/91	ND	ND	ND	ND	ND	--	--	--
	03/28/91	ND	ND	ND	ND	ND	--	--	--
	04/24/91	ND	ND	ND	ND	ND	--	--	--
	07/24/91	ND	ND	ND	ND	ND	--	--	--
	10/24/91	ND	ND	ND	ND	ND	--	--	--
	01/24/92	ND	ND	ND	ND	ND	--	--	--
	05/01/92	ND	ND	ND	ND	ND	--	--	--
	08/06/92	ND ✓	ND ✓	ND ✓	ND ✓	ND ✓	--	--	--

¹ TVH = Total Volatile Hydrocarbons

² BTXE = Benzene, Toluene, Xylene, and Ethylbenzene

³ EPA 8011, ethylene dibromide

⁴ EPA 8010, 1, 2 dichloroethane

⁵ ug/L = micrograms per liter

⁶ ND = None detected, chemicals not present at concentrations above the detection limits

⁷ -- = Test not requested

Table 2. Groundwater Elevation Data

<u>Monitoring Well</u>	<u>TOC Elev¹ (feet)</u>	<u>Date</u>	<u>Groundwater Depth (feet)</u>	<u>Groundwater Elevation (feet)</u>	<u>Free Product Thickness (feet)</u>
11	99.66	01/19/89	26.82	72.84	--
		04/03/89	26.35	73.31	--
		07/05/89	26.95	72.71	--
		11/09/89	27.28	72.83	--
		01/24/89	27.40	72.26	--
		04/30/90	27.56	72.10	--
		07/03/90	28.89	70.77	--
		10/23/90	28.93	70.73	--
		01/21/91	27.75	71.97	--
		04/24/91	28.14	71.52	--
		07/24/91	28.78	70.88	--
		10/24/91	29.09	70.57	--
		01/23/92	29.85	69.81	--
		05/01/92	27.44	72.22	--
08/07/92	27.86	71.80	--		
28	98.99	01/19/89	26.16	72.83	--
		04/03/89	25.70	73.29	--
		07/05/89	26.26	72.73	--
		11/08/89	26.59	72.40	--
		01/24/90	26.81	72.18	--
		05/10/90	31.83	65.96	1.22
	97.79	07/03/90	31.95	65.84	0.04
		10/23/90	31.25	66.54	1.38
		01/21/91	28.00	69.79	0.00
		10/24/91	27.26	70.53	0.00
		01/23/92	32.99	64.89	0.00
		08/07/92	26.95	70.84	-- ²
29	97.95	01/19/89	26.14	71.81	--
		04/03/89	25.88	72.07	--
		07/05/89	26.19	71.76	--
		11/09/89	26.51	71.44	--
		01/24/90	26.66	71.29	--
		04/30/90	26.73	71.22	--
		07/03/90	27.22	70.73	--
		10/23/90	27.40	70.55	--
		01/21/91	26.89	71.06	--
		03/28/91	27.04	70.91	--
		10/24/91	27.47	70.48	--
		01/23/92	27.89	70.06	--

Table 2. Groundwater Elevation Data (continued)

<u>Monitoring Well</u>	<u>TOC Elev¹ (feet)</u>	<u>Date</u>	<u>Groundwater Depth (feet)</u>	<u>Groundwater Elevation (feet)</u>	<u>Free Product Thickness (feet)</u>		
30	99.30	01/19/89	27.50	71.80	1.56		
		04/03/89	28.44	70.86	2.56		
		07/05/89	28.90	70.40	3.38		
		11/09/89	29.52	69.78	3.67		
		04/30/90	27.23	72.07	0.29		
		07/03/90	29.07	70.23	0.57		
		10/23/90	29.07	70.23	1.27		
		01/21/91	29.09	70.23	2.27		
		04/24/91	27.80	71.50	0.19		
		05/31/91	28.08	71.23	0.49		
		10/24/91	28.94	70.36	0.00		
		31	98.90	01/19/89	26.15	72.75	--
				04/03/89	25.90	73.00	--
07/05/89	26.28			72.76	--		
11/09/89	26.64			72.26	--		
01/24/90	26.84			72.06	--		
04/30/90	26.87			72.03	--		
07/03/90	27.50			71.40	--		
09/23/90	27.52			71.36	--		
01/21/91	27.09			71.81	--		
04/24/91	27.12			71.78	--		
07/24/91	27.60			71.30	--		
10/24/91	28.81			70.09	--		
01/23/92	28.31			70.59	--		
05/01/92	26.70			72.20	--		
08/07/92	27.00	71.90	--				
32	98.53	01/24/90	25.64	72.89	--		
		04/30/90	25.82	72.71	--		
		06/01/90	26.30	72.23	--		
		10/23/90	26.70	71.83	--		
		01/21/91	26.06	72.47	--		
		04/24/91	26.40	72.13	--		
		10/24/91	27.05	71.48	--		





Table 2. Groundwater Elevation Data (continued)

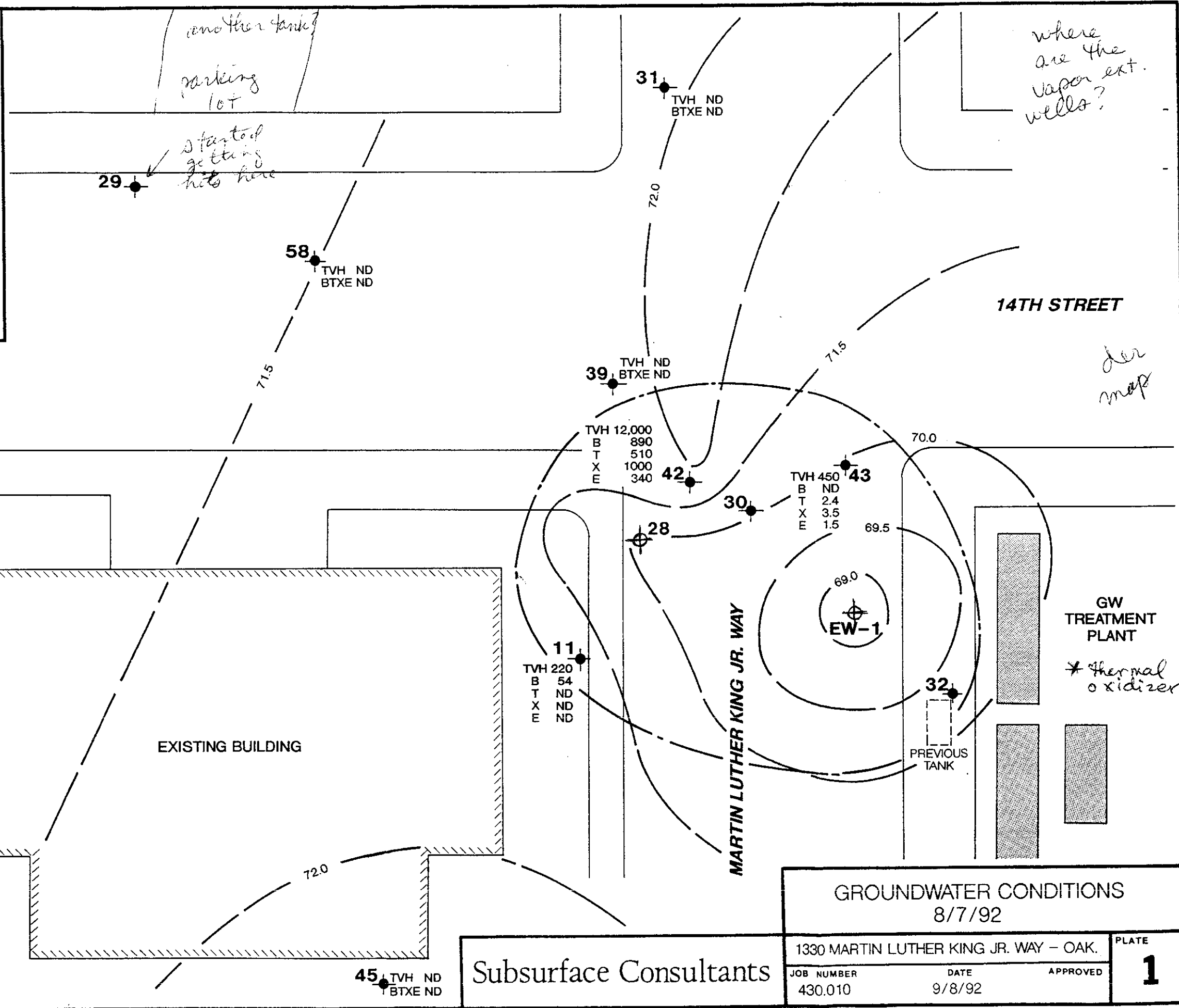
<u>Monitoring Well</u>	<u>TOC Elev¹ (feet)</u>	<u>Date</u>	<u>Groundwater Depth (feet)</u>	<u>Groundwater Elevation (feet)</u>	<u>Free Product Thickness (feet)</u>		
39	99.00	04/03/89	25.87	73.13	--		
		07/05/89	26.38	72.62	--		
		11/09/89	26.70	72.30	--		
		01/24/90	26.86	72.14	--		
		04/30/90	26.97	72.03	--		
		07/03/90	28.17	70.83	--		
		10/23/90	28.17	70.83	--		
		01/21/91	27.15	71.85	--		
		03/28/91	27.76	71.24	--		
		04/24/91	27.33	71.67	--		
		07/24/91	27.91	71.09	--		
		10/24/91	28.26	70.74	--		
		01/23/92	29.00	70.00	--		
		05/01/92	26.82	72.18	--		
08/07/92	27.18	71.82	--				
42	99.12	04/03/89	25.77	73.35	--		
		07/05/89	26.30	72.89	--		
		11/09/89	26.66	72.46	--		
		01/24/90	26.82	72.30	--		
		04/18/90	26.94	72.18	--		
		07/03/90	28.58	70.54	--		
		10/23/90	28.58	70.54	0.08		
		07/24/91	28.10	71.02	0.00		
		10/24/91	28.24	70.88	--		
		01/23/92	29.33	69.79	--		
		05/01/92	26.88	72.44	--		
		08/07/92	27.10	72.02	--		
		43	98.87	04/03/89	25.32	73.55	0.08
				07/05/89	26.80	72.07	1.34
11/09/89	28.44			70.43	2.89		
04/30/90	27.05			71.82	0.79		
07/03/90	28.36			70.51	0.70		
10/23/90	28.19			70.68	0.83		
10/24/91	26.30			72.57	0.00		
01/24/92	28.25			70.62	0.02		
05/01/92	25.44			73.43	0.00		
08/07/92	25.11			73.76	--		

Table 2. Groundwater Elevation Data (continued)


<u>Monitoring Well</u>	<u>TOC Elev¹ (feet)</u>	<u>Date</u>	<u>Groundwater Depth (feet)</u>	<u>Groundwater Elevation (feet)</u>	<u>Free Product Thickness (feet)</u>
45	100.90	12/05/89	28.71	72.19	--
		04/30/90	28.85	72.05	--
		07/03/90	29.45	71.45	--
		10/23/90	29.50	71.40	--
		01/21/91	29.03	71.87	--
		04/24/91	28.87	72.03	--
		07/25/91	29.63	71.27	--
		10/24/91	29.62	71.28	--
		01/23/92	30.45	70.45	--
		05/01/92	28.42	72.48	--
		08/07/92	28.70	72.20	--
46	98.11	12/19/89	27.40	70.71	--
		04/30/90	27.46	70.63	--
		07/03/90	27.75	70.36	--
		10/23/90	27.86	70.25	--
		01/21/91	27.60	70.51	--
		04/24/91	27.40	70.71	--
		07/24/91	28.73	69.38	--
		10/24/91	27.88	70.23	--
		01/23/92	28.31	69.80	--
				08/07/92	27.28
58	98.89	01/30/91	28.25	70.64	--
		03/28/91	27.81	71.08	--
		04/24/91	27.55	71.34	--
		07/24/91	33.42	65.47	--
		10/24/91	28.29	70.60	--
		01/23/92	28.75	70.14	--
		05/01/92	27.10	71.79	--
				08/07/92	27.40

¹ Elevation reference: PG&E manhole approximately 30 feet south of 14th Street on Martin Luther King Jr. Way, assumed to be 100.00 feet, TOC = Top of casing
² -- = No free product present


-  EXTRACTION WELL - 2
-  MONITORING WELL
-  GROUNDWATER SURFACE ELEVATION CONTOURS (feet)
-  APPROXIMATE EXTENT OF DISSOLVED PRODUCT PLUME
- TVH TOTAL VOLATILE HYDROCARBONS
- BTXE BENZENE, TOLUENE, XYLENES, ETHYLBENZENE
- ND NONE DETECTED
- CONCENTRATIONS IN ug/l



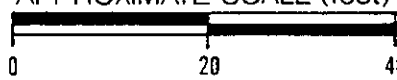
REFERENCE NORTH



TRUE NORTH



APPROXIMATE SCALE (feet)



GROUNDWATER CONDITIONS 8/7/92		
1330 MARTIN LUTHER KING JR. WAY - OAK.		
JOB NUMBER 430.010	DATE 9/8/92	APPROVED
Subsurface Consultants		PLATE 1



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710. Phone (415) 486-0900

DATE RECEIVED: 04/24/91
DATE REPORTED: 04/29/91

LAB NUMBER: 103625

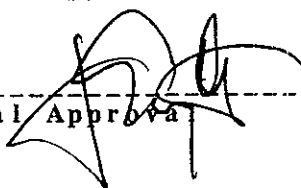
CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010
LOCATION: MLK EXTRACTION

RESULTS: SEE ATTACHED



QA/QC Approval



Final Approval

LABORATORY NUMBER: 103625
 CLIENT: SUBSURFACE CONSULTANTS
 PROJECT ID: 430.010
 LOCATION: MLK EXTRACTION

DATE RECEIVED: 04/24/91
 DATE ANALYZED: 04/27/91
 DATE REPORTED: 04/29/91

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions
 TVH by California DOHS Method/LUFT Manual October 1989
 BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
103625-1	MW-11	4,800	1,100	3.5	120	46
103625-2	MW-31	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103625-3	MW-32	170	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103625-4	MW-39	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103625-5	MW-45	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103625-6	MW-46	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103625-7	MW-58	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not detected at or above reporting limit; Reporting limit
 indicated in parentheses.

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	101



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 07/25/91

DATE REPORTED: 07/31/91


LAB NUMBER: 104608

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK GW

RESULTS: SEE ATTACHED



QA/QC Approval



Final Approval

LABORATORY NUMBER: 104608
 CLIENT: SUBSURFACE CONSULTANTS
 PROJECT ID: 430.010
 LOCATION: MLK GW

DATE RECEIVED: 07/25/91
 DATE ANALYZED: 07/27,30/91
 DATE REPORTED: 07/31/91

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions
 TVH by California DOHS Method/LUFT Manual October 1989
 BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
104608-1	MW-11	950	330	0.9	12	1.8
104608-2	MW-31	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
104608-3	MW-39	ND(50)	1.4	ND(0.5)	ND(0.5)	ND(0.5)
104608-4	MW-42	21,000	2,200	300	180	650
104608-5	MW-45	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
104608-6	MW-46	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
104608-7	MW-58	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not detected at or above reporting limit; Reporting limit indicated in parentheses.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	100



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2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 10/24/91
DATE REPORTED: 11/12/91


LABORATORY NUMBER: 105596

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK GW MONITORING WELLS

RESULTS: SEE ATTACHED



QA/QC Approval



Final Approval

LABORATORY NUMBER: 105596
 CLIENT: SUBSURFACE CONSULTANTS
 PROJECT ID: 430.010
 LOCATION: MLK GW MONITORING WELLS

DATE RECEIVED: 10/24/91
 DATE ANALYZED: 11/06,07/91
 DATE REPORTED: 11/12/91

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions
 TVH by California DOHS Method/LUFT Manual October 1989
 BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
105596-1	MW-11	970	350	1.6	14	1.6
105596-2	MW-31	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
105596-3	MW-39	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
105596-4	MW-42	18,000	2,300	1,100	260	1,000
105596-5	MW-43	6,300	ND(2.5)	ND(2.5)	9.1	130
105596-6	MW-45	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
105596-7	MW-46	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
105596-8	MW-58	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not detected at or above reporting limit; Reporting limit
 indicated in parentheses.

QA/QC SUMMARY

RPD, %	6
RECOVERY, %	97

LABORATORY NUMBER: 105596
 CLIENT: SUBSURFACE CONSULTANTS
 PROJECT ID: 430.010
 LOCATION: MLK GW MONITORING WELLS

DATE RECEIVED: 10/24/91
 DATE ANALYZED: 11/08/91
 DATE REPORTED: 11/12/91

=====
 ANALYSIS: ETHYLENE DIBROMIDE
 ANALYSIS METHOD: EPA 504
 =====

LAB ID	SAMPLE ID	RESULT	UNITS	REPORTING LIMIT
105596-1	MW-11	ND	ug/L	0.02
105596-3	MW-39	ND	ug/L	0.02
105596-4	MW-42	16	ug/L	2.0

ND = Not detected at or above reporting limit.

QA/QC SUMMARY

=====
 RPD, % 5
 RECOVERY, % 95
 =====



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2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 01/24/92
DATE REPORTED: 01/30/92

LABORATORY NUMBER: 106378

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK EXTRACTION

RESULTS: SEE ATTACHED

Kathleen O'Brien
Reviewed By

[Signature]
Reviewed By

LABORATORY NUMBER: 106378
 CLIENT: SUBSURFACE CONSULTANTS
 PROJECT ID: 430.010
 LOCATION: MLK EXTRACTION

DATE RECEIVED: 01/24/92
 DATE ANALYZED: 01/28-30/92
 DATE REPORTED: 01/30/92

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions
 TVH by California DOHS Method/LUFT Manual October 1989
 BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
106378-1	MW-11	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
106378-2	MW-31	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
106378-3	MW-39	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
106378-4	MW-42	10,000	1,100	280	300	430
106378-5	MW-45	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
106378-6	MW-58	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not detected at or above reporting limit; Reporting limit indicated in parentheses.

QA/QC SUMMARY

RPD, %	3
RECOVERY, %	94



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2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 05/01/92

DATE REPORTED: 05/08/92

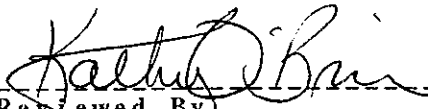
LABORATORY NUMBER: 107270

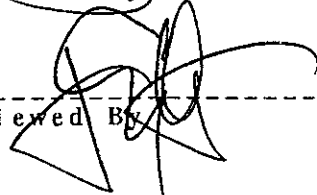
CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK GW EXTRACTION

RESULTS: SEE ATTACHED


Reviewed By


Reviewed By

LABORATORY NUMBER: 107270
 CLIENT: SUBSURFACE CONSULTANTS
 PROJECT ID: 430.010
 LOCATION: MLK GW EXTRACTION

DATE RECEIVED: 05/01/92
 DATE ANALYZED: 05/03-05/92
 DATE REPORTED: 05/08/92

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions
 TVH by California DOHS Method/LUFT Manual October 1989
 BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
107270-1	MW-11	340	77	0.6	ND(0.5)	0.6
107270-2	MW-31	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
107270-3	MW-39	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
107270-4	MW-42	16,000	1,200	330	220	580
107270-5	MW-43	930	ND(0.5)	ND(0.5)	ND(0.5)	3.8
107270-6	MW-45	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
107270-7	MW-58	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not detected at or above reporting limit; Reporting limit
 indicated in parentheses.

QA/QC SUMMARY

RPD, %	2
RECOVERY, %	87



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

DATE RECEIVED: 08/07/92

DATE REPORTED: 08/26/92

LABORATORY NUMBER: 108202

*current
analytical
data*

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK EXTRACTION

RESULTS: SEE ATTACHED

Reviewed by

Reviewed By

LABORATORY NUMBER: 108202
 CLIENT: SUBSURFACE CONSULTANTS
 PROJECT ID: 430.010
 LOCATION: MLK EXTRACTION

DATE SAMPLED: 08/06-07/92
 DATE RECEIVED: 08/07/92
 DATE ANALYZED: 08/12/92
 DATE REPORTED: 08/26/92

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions
 TVH by California DOHS Method/LUFT Manual October 1989
 BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
108202-1	MW-11	220	54	ND(0.5)	ND(0.5)	ND(0.5)
108202-2	MW-31	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
108202-3	MW-39	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
108202-6	MW-45	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
108202-7	MW-58	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

ND = Not detected at or above reporting limit; Reporting limit
 indicated in parentheses.

QA/QC SUMMARY

=====
 RPD, % 8
 RECOVERY, % 108
 =====

LABORATORY NUMBER: 108202
 CLIENT: SUBSURFACE CONSULTANTS
 PROJECT ID: 430.010
 LOCATION: MLK EXTRACTION

DATE SAMPLED: 08/06-07/92
 DATE RECEIVED: 08/07/92
 DATE ANALYZED: 08/19/92
 DATE REPORTED: 08/26/92

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions
 TVH by California DOHS Method/LUFT Manual October 1989
 BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
108202-4	MW-42	12,000	890	510	340	1,000

QA/QC SUMMARY

=====
 RPD, % 4
 RECOVERY, % 108
 =====

LABORATORY NUMBER: 108202
 CLIENT: SUBSURFACE CONSULTANTS
 PROJECT ID: 430.010
 LOCATION: MLK EXTRACTION

DATE SAMPLED: 08/06-07/92
 DATE RECEIVED: 08/07/92
 DATE ANALYZED: 08/19/92
 DATE REPORTED: 08/26/92

Total Volatile Hydrocarbons with BTXE in Aqueous Solutions
 TVH by California DOHS Method/LUFT Manual October 1989
 BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (ug/L)	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
108202-5	MW-43	450	ND(0.5)	2.4	1.5	3.5

ND = Not detected at or above reporting limit; Reporting limit
 indicated in parentheses.

QA/QC SUMMARY

RPD, % 1
 RECOVERY, % 94

Subsurface Consultants

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name: MLK GW
 SCI Job Number: 430,010
 Project Contact at SCI: Sean Carson
 Sampled By: Charlie Pearson, Jairo Lopez
 Analytical Laboratory: C+T
 Analytical Turnaround: Normal

Sample ID	Sample Type ¹	Container Type ²	Sampling Date	Hold	Analysis	Analytical Method
MW-11	W	Vx3	4/24/91		TVH/BTXE	
MW-31						
MW-32						
MW-39						
MW-45						
MW-46						
MW-58						

* * * * *

Released by: [Signature] Received by: _____ Date: 04/24/91
 Released by: _____ Received by: _____ Date: _____
 Received by Laboratory: [Signature] Date: 4/24/91
 Released by Laboratory: _____ Date: _____
 Released by: _____ Date: _____

¹ Sample Type: W = Water, S = Soil, O = Other (specify)
² Container Type: V = VOA, P = Plastic, G = Glass, T = Brass Tube, O = Other (specify)

NOTES TO LABORATORY:
 - Notify SCI if there are any anomalous peaks on GC or other scans
 - Questions/clarifications - Contact SCI at (415) 268-0461

Subsurface Consultants

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name: MLK GW
 SCI Job Number: 430.010
 Project Contact at SCI: Sean Carson
 Sampled By: Charles Pearson
 Analytical Laboratory: Curtis & Tompkins
 Analytical Turnaround: Normal

Sample ID	Sample Type ¹	Container Type ²	Sampling Date	Hold	Analysis	Analytical Method
MW-11	W	VX3	7/24/91		TVH/BTXE	8015 mod/8020/5030
MW-31	W	VX3	7/24/91		"	"
MW-39	W	VX3	7/24/91		"	"
MW-42	W	VX3	7/24/91		"	"
MW-45	W	VX3	7/25/91		"	"
MW-46	W	VX3	7/24/91		"	"
MW-58	W	VX3	7/24/91		"	"

* * * * *

Released by: Charles Pearson Received by: _____ Date: 7/25/91
 Released by: _____ Received by: _____ Date: _____
 Received by Laboratory: Nancy Wilson Date: 7/25/91
 Released by Laboratory: _____ Date: _____
 Released by: _____ Date: _____

¹ Sample Type: W = Water, S = Soil, O = Other (specify)
² Container Type: V = VOA, P = Plastic, G = Glass, T = Brass Tube, O = Other (specify)

NOTES TO LABORATORY:
 - Notify SCI if there are any anomalous peaks on GC or other scans
 - Questions/clarifications - Contact SCI at (415) 268-0461

CHAIN OF CUSTODY FORM

PROJECT NAME: MLK GW Monitoring Wells
 JOB NUMBER: 430,010 LAB: Curtis+Tompkins
 PROJECT CONTACT: Sean Carson TURNAROUND: Normal
 SAMPLED BY: Charlie Pearson/Marianne Watado REQUESTED BY: Sean Carson

ANALYSIS REQUESTED	
TVH/BIXE	
(EPA 8015/8020/8030)	
ED13 (EPA 8011)	
EPA 504	

LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	MATRIX				CONTAINERS			METHOD PRESERVED					SAMPLING DATE				NOTES	
		WATER	SOIL	WASTE	AIR	VOA	LITER	PINT	TUBE	HCL	H2SO4	HNO3	ICE	NONE	MONTH	DAY	YEAR		TIME
	MW-11	X				4			X			X		10	24	91	09	30	
	MW-31	X				3			X			X					10	00	
	MW-39	X				5			X			X					10	30	
	MW-42	X				5			X			X					11	00	
	MW-43	X				3			X			X					12	00	
	MW-45	X				3			X			X					11	30	
	MW-46	X				3			X			X					12	30	
	MW-58	X				3			X			X					13	00	

COMMENTS & NOTES:

CHAIN OF CUSTODY RECORD			
RELEASED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
<i>Charlie Pearson</i>	10/24/91 12:30 PM		
RELEASED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
RELEASED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
			10.24.91 1430

Subsurface Consultants, Inc.
 171 12TH STREET, SUITE 201, OAKLAND, CALIFORNIA 94607
 (510) 268-0461 • FAX: 510-268-0137

CHAIN OF CUSTODY FORM

PROJECT NAME: MLK GW Monitoring Wells
 JOB NUMBER: 430.010 LAB: Curtis + Tompkins
 PROJECT CONTACT: Sean Carson TURNAROUND: Normal
 SAMPLED BY: Fernando Velez/Joe Bermudez REQUESTED BY: Sean Carson

ANALYSIS REQUESTED											

LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	MATRIX				CONTAINERS				METHOD PRESERVED					SAMPLING DATE				NOTES
		WATER	SOIL	WASTE	AIR	VOA	LITER	PINT	TUBE	HCL	H2SO4	HNO3	ICE	NONE	MONTH	DAY	YEAR	TIME	
	MW-11	X				3				X					01	23	92		TVH/BIXE (EPA 8015/8020/5030)
	MW-31	X								X									
	MW-39	X								X									
	MW-42	X								X									
Se	MW-43	X								X									
	MW-45	X								X									
	MW-58	X								X									

COMMENTS & NOTES:

CHAIN OF CUSTODY RECORD			
RELEASED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
RELEASED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
RELEASED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
<i>[Signature]</i>	1/24/92 3:50	<i>[Signature]</i>	1/24/92

Subsurface Consultants, Inc.

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CHAIN OF CUSTODY FORM

PAGE _____ OF _____

PROJECT NAME: MLK GW Extraction
 JOB NUMBER: 430.010 LAB: Curtis + Tompkins
 PROJECT CONTACT: Sean Carson TURNAROUND: Normal
 SAMPLED BY: _____ REQUESTED BY: Sean Carson

ANALYSIS REQUESTED											

LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	MATRIX				CONTAINERS				METHOD PRESERVED					SAMPLING DATE				NOTES
		WATER	SOIL	WASTE	AIR	VOA	LITER	PINT	TUBE	HCL	H2SO4	HNO3	ICE	NONE	MONTH	DAY	YEAR	TIME	
	MW-11	X								X			X		05	01	92		TVH/BTXE
	MW-31	X								X			X						
	MW-39	X								X			X						
	MW-42	X								X			X						
	MW-43	X								X			X						
	MW-45	X								X			X						
	MW-58	X								X			X						

COMMENTS & NOTES:

CHAIN OF CUSTODY RECORD			
RELEASED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
		<i>Name Dubin</i>	5/1/92 2:00 PM
RELEASED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
RELEASED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	DATE/TIME
<i>Sean Carson</i>	5/1/92 3:00 PM		

Subsurface Consultants, Inc.
 171 12TH STREET, SUITE 201, OAKLAND, CALIFORNIA 94607
 (510) 268-0461 • FAX: 510-268-0137

CHAIN OF CUSTODY FORM

PROJECT NAME: MLK GW
 JOB NUMBER: 430,010 LAB: Curtis + Tompkins
 PROJECT CONTACT: Sean Carson TURNAROUND: Normal
 SAMPLED BY: Jose Bermudez REQUESTED BY: Sean Carson

ANALYSIS REQUESTED											

LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	MATRIX				CONTAINERS				METHOD PRESERVED					SAMPLING DATE				NOTES
		WATER	SOIL	WASTE	AIR	VOA	LITER	PINT	TUBE	HCL	H2SO4	HNO3	ICE	NONE	MONTH	DAY	YEAR	TIME	
	MW-11	X				W				X			X		08	06	92	13:00	X
	MW-31	X				W				X			X		08	07	92	11:00	X
	MW-39	X				W				X			X		08	07	92	11:00	X
	MW-42	X				W				X			X		08	07	92	11:00	X
	MW-43	X				W				X			X		08	07	92	11:00	X
	MW-45	X				W				X			X		08	06	92	14:00	X
	MW-58	X				W				X			X		08	06	92	14:00	X

COMMENTS & NOTES:

CHAIN OF CUSTODY RECORD

RELEASED BY: (Signature) <u>Jose H. Bermudez</u> DATE/TIME <u>8/7/92</u>	RECEIVED BY: (Signature) _____ DATE/TIME _____
RELEASED BY: (Signature) _____ DATE/TIME _____	RECEIVED BY: (Signature) _____ DATE/TIME _____
RELEASED BY: (Signature) _____ DATE/TIME _____	RECEIVED BY: (Signature) <u>Joanne Heath</u> DATE/TIME _____

Subsurface Consultants, Inc.
 171 12TH STREET, SUITE 201, OAKLAND, CALIFORNIA 94607
 (510) 268-0461 • FAX: 510-268-0137