Curtis & Tompkins, Ltd.

Subsurface Consultants

client:

Project Name: 13TH & JEFFERSON GW Project Number: 430.013

21 March 91

Report Date:

Laboratory Login Number: 103232

Grease (Gravimetric) ANALYSIS: Hydrocarbon Oil &

QC Batch	1065				
Analyst	TR				
Method	5520 <b>BF</b>				
ts RL	ا- د				
Result Units	ND mg/L				
Analyzed	13-MAR-91 13-MAR-91 14-MAR-91 19-MAR-91				
Received Ordered	14-MAR-91				
Received	13-MAR-91				
Sampled	13-MAR-91				
Matrix	Water				, 100, 130 (1) 100, 130 (1) 100, 130 (1)
Q					
Sample 10	02 #48				
Lab ID	103232-002 #48		 ···	 	 

ND = Not Detected at or above Reporting Limit (RL).

# QC Batch Report

Subsurface Consultants 13TH & JEFFERSON GW 430.013

Client: Project Name: Project Number:

QC Batch Number: 1065

Laboratory Login Number: 103232 Report Date: 21 March 91

# ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)

Blank Results					
Sample ID	Result	MDL	Units	Method	Date Analyzed
BLANK	ND	Ŋ	mg/L	5520BF	19-MAR-91
Spike/Duplicate Results				,	
Sample ID	Recovery			Method	Date Analyzed
BS BSD	8 8 8 8 8 8			5520BF 5520BF	19-MAR-91 19-MAR-91
Averac Relati	Average Spike Recovery Relative Percent Difference	/ery  fferenc		Control Limits 84% 80% - 120% 6.1% < 20%	Limits 120% < 20%



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

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

DATE RECEIVED: 04/03/91 DATE REPORTED: 04/09/91

LAB NUMBER: 103425

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 1 WATER SAMPLE

PROJECT ID: 430.013

LOCATION: 13TH & JEFFERSON GW

RESULTS: SEE ATTACHED



LABORATORY NUMBER: 103425-1 CLIENT: SUBSURFACE CONSULTANTS PROJECT ID: 430.013

SAMPLE ID: MW-59

DATE RECEIVED: 04/03/91 DATE ANALYZED: 04/05/91 DATE REPORTED: 04/09/91

# EPA 8010 Purgeable Halocarbons in Water

	Result	Reporting
Compound	ug/L	Limit
	_	ug/L
	ND	2.0
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	1.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
1,2.dichloroethene (total)	ND	1.0
chloroform	ND	1.0
freen 113	ND	1.0
1,2-dichleroethane	ND	1.0
l, l, l-trichloroethane	ND	1.0
carbon tetrachioride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1 . 0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	2.0
2.chloroethyl vinyl ether	ND	1.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	••	

ND = Not detected at or above reporting limit.

QA/QC SUMMARY	120002222332222222222222222222222222222
三二二二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十二十	7
RPD, %	98
RECOVERY, %	

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Nam	ne:	13th + Je	Alerson			
SCI Job Num	nber:	430	.003			
Project Con	ntact at S					
Sampled By:		Joh	n Wolfe	Chri	s O Dea	
Analytical	Laborator	Y:	Curtes.	-Tomp	Kins	
Analytical	Turnarour	nd:	Nov	ma		
Sample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling Date	<u>Hold</u>	Analysis	Analytical Method
47	$\underline{W}$	1 liter 3 VOAS 1	wy/6/90		TVH/BTXE	8015/602
_ 48	$\sim$	4,	L <sub>r</sub>		11 %	4 5
49	$\underline{W}_{-}$				<i>c, c,</i>	1, 1,
_5L_	W	<u>'.</u>	.,		4 4	9
_57	$\overline{\mathbb{W}}$	·,	` ',		<u> </u>	<u>', '.</u>
	<u>.                                    </u>				<u> </u>	
	*	*	*	*	*	*
Released b	y:	alle			Date:	4/9/90
Released b	y Courier	•			Date:	
Received b	y Laborat	ory: Navu	afatter		Date:	: 4/9/90
Relinquish	ned by Lab	oratory:			Date:	•
Received b	у:				Date	•
<sup>1</sup> Sample T	Type: W = er Type:	water, S = V = VOA, P = O = other (S	: plastic, c	other (s } = glas	specify) ss, T = brass	s tube,

Notes to Laboratory:

<sup>-</sup>Notify SCI if there are any anomalous peaks on GC or other scans -Questions/clarifications...contact SCI at (415) 268-0461

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name:	13th +	Jeffer	son		
SCI Job Number:	1	130,00	3		
Project Contact at S	CI:	Sean	Car	son	
Sampled By:					
Analytical Laborator				•	
Analytical Turnaroun	d:		5 d	s/	
Sample Sample ID Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling Date	<u> Hold</u>	Analysis	Analytical Method
MW-53 W					8015/8020/5
MW-54 W	<u>V.6</u>	9/21/90		TVH/BIX I	015/8020/50
	<del></del>				<del></del>
				<del></del>	
		<u> </u>	<del></del>		
	<u></u>				
	<del></del>				
*	* // // /-	*	×	*	*
Released by:	/ww	<u> </u>		Date:	5=P-24-90
Released by Courier:	1: 11	A		Date:	
Received by Laborato	ory: Many	nuitue		Date:	9/24/90 10:10
Relinquished by Labo	( )v			Date:	1
Received by:				Date:	
<pre>1 Sample Type: W = 2 Container Type: \( \) (</pre>	water, S = / = VOA, P = ) = other (s	plastic, G	ther (s = glas	pecify) s, T = brass	tube,

Notes to Laboratory:

<sup>-</sup>Notify SCI if there are any anomalous peaks on GC or other scans -Questions/clarifications...contact SCI at (415) 268-0461

Project Na	me:	13th +	Jeffeso	n C	3W	
SCI Job Nu	mber:	<u></u>	130,00	3	·	
Project Co	ntact at SC	:	Sean C	<u> </u>		
Sampled By	•		Fernand	o V	elez	
Analytical	Laboratory	7:	Curh	s + TO	mpkins	
Analytical	Turnaround	1:	Nor	mal	· · · · · · · · · · · · · · · · · · ·	
Sample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling Date 10/4/90	<u>Hold</u>	Analysis BIXE	Analytical Method  MODO
		01×1			Pussar'y e	
48	101	P.I.	10/4/90	<del></del>	Total Lead TEH	8015/3550
		JXZ			BIXE	8020
						SMWW 5520R
	···			<del></del>	Total Lead	
					PCBs only	
		Vx2			DNAs on'y NOCs Methylena Chl	
	*	* /	* /	*	*	*
Released b	y:	fried 1			Date:_	10-04-90
Released b	<del></del>		). <del>/</del>		Date:_	
Received b	y Laborator	y: Mary T	Millia		Date:_	6/4/90 4pm
Relinquish	ed by Labor	ratory:			Date:_	
Received b						·
Sample To Containe	r Type: V	vater, S = so = VOA, P = 1 = other (spe	plastic, G	her (spe = glass,	ecify) , T = brass	tube,

Notes to Laboratory:

<sup>-</sup>Notify SCI if there are any anomalous peaks on GC or other scans -Questions/clarifications...contact SCI at (415) 268-0461

Project Name: 13th				
SCI Job Number:	430,00			
Project Contact at SCI:	Sean C	3000		
Sampled By:	Ε Λ	o Velez		
Analytical Laboratory:	Curh	s + Tomp	oking	
Analytical Turnaround:	No	rmal_		<del></del>
Sample Contains		<u> Hold An</u>	alysis	Analytical Method
	/ )			
51 W V*				20A 8020
<u>52</u> <u>W</u> <u>V</u>	2 10/4/90		JXE (	ZAA 8020
	`			
	<u> </u>			
* *	* \( \)	*	*	*
	and [1/2]	·	Pa+a:	10-04-90
Released by:			Date:	
Released by Courier:	Va Dietie		Bate:_ Date:[	/ / ; i
Received by Laboratory:	' ()		bate:	11/2-1/2/11
Relinquished by Laboratory				
Received by:	S = coil 0 = ci	ther (speci	<del></del> -	<del></del>
Sample Type: W = water, Container Type: V = VOA O = oth	S = soil, U = of ., P = plastic, G er (specify)	= glass, T	= brass	tube,

Notes to Laboratory:
-Notify SCI if there are any anomalous peaks on GC cr other scans -Questions/clarifications...contact SCI at (415) 268-0461

Project Name	e:	13th +	· Teffers	on G	,W	
SCI Job Num	ber:	· · · · · · · · · · · · · · · · · · ·	430,00	<u>2</u>		
Project Con	tact at SC	::	Sean	Carso	<u>~</u>	
Sampled By:			Fernan	lo Vel	<u>57</u>	
Analytical	Laboratory	* •	<u></u>	7-2-	ompkins	<u> </u>
Analytical '	Turnaround		रि ९	2id		<del> </del>
Sample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling Date	<u> Hold</u>	Analysis	Analytical Method
MW-54	W	<u>V*Z</u>	10/4/90	*	TVH/BTX	E
		V×Z_	·		VOC3	EPA 8010
	·	V*Z			EDB	PHS-AB1803
		<u>P* 1</u>			TEL	DHS-LUPT
		P* 1				AA_
		Glx		<del></del>	PNAS	EPA 827-0
MW-53	101	V Z	10/4/90			E
		Pxl			Total Lead	2 AA
		Px			TEL_	DHS-LUPT
	<del></del>	V*Z			EDB	DHS-AB 1803
*		× V×Z	* ^	*	V OC 5	#PA 8010
Released by		Pain	11 33		Date	: 13/24/32
Released by		V			 Date	•
Received by	_	v: Uman	in afattic	; <sub>0</sub>	Date	: 10/4 /90 1230°
Relinguishe			ζ		Date	:
Received by	<del>-</del>	*			Date	:
I Sample Ty	pe: W = v Type: V	vater, S = = VOA, P = = other (s	soil, 0 = ot plastic, G pecify)	ther (sp = glass	pecify) s, T = bras	s tube,

Notes to Laboratory:

<sup>-</sup>Notify SCI if there are any anomalous peaks on GC or other scans -Questions/clarifications...contact SCI at (415) 268-0461

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Nam	e:	13th +	Jeffer	SOM	_		
SCI Job Num		(	130,003	)	·		
					_		
Project Con	tact at S	CI:					
Sampled By:			•		(CZ.		
Analytical	Laborator				•	<u> </u>	
Analytical	Turnarour	nd:		) day	/		
Sample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling	Hold	Analysis	Analytical Method	
47	W	V×4	12/3/90		TXHIBIX	EPA 8010 EEPA 8015/8020	. /503ī
48	W	Vx 4	12/3/90		VOCS TVH/BIXE	EDA 9015/35	<u>ত</u>
	$\underline{\hspace{1cm}}$	Gl × 3			TE HE	EPA 8015/355 EPA 8090 SMWW 50	ZO E
49	$\overline{\mathcal{M}}$	V* 4	12/3/90			EPA 8015/2020	0802\0
51	<u>\J</u>	V × 4	12/4/90			·	
52	W	V×U	12/4/90		VOCS TVH/BTXE		
53	W	V×4	12/4/90	<del></del>	TVH/BTXR		
54	$-\omega$	VXY	12/4/90		VOLS TVH/BIXE		
					<u>,</u>		
ť	*	* 1	*	*	*	*	
Released by	· ·	Chan!	, John		Date:	12/4/9	10
Released by			Λ		 Date:		
Received by					 Date:	17-4-50	A:00
Relinquish			Jan Jan				
Received by		•	<u></u>		Date:		
1 Comple Th	ype: W =	water, S = V = VOA, P = O = other (S	plastic, G	ther (s = glas	pecify) s, T = brass	s tube,	

Notes to Laboratory:

<sup>-</sup>Notify SCI if there are any anomalous peaks on GC or other scans -Questions/clarifications...contact SCI at (415) 268-0461

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name	e:	ULK				
SCI Job Numb	per:	430.010	?			
Project Con	tact at S	CI: <u>Sequ</u>	Carso	<u> </u>		
Sampled By:		John 4				
			,	Tompk		
		y: <u>C</u> a		10mg1-		
Analytical '	Turnaroun	d:	5 day			
Sample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling Date	<u>Hold</u>	Analysis	Analytical Method
MW-29 1	2/	2 Voas	1-4-90		3010-	>
1W-31 2	<u>k/</u>	*1			3010	
MW- 45 3	W	tı .			3010	>
MW-48 4	W	, t	14		3010-	>
NW- 475	w	11	11		8010-	>
1W- 48.	W	11	<i>P</i> \$		7010	
MW-547	w	11				
				····		
				<del></del>		<u></u>
· <del>*</del>	; ;	* *	*		*	<del>k</del>
Released by	: fain	Rece	ived by:		Date:	01-04-91
Released by	U	Rece	ived by:		Date:	
-Received by		ory: Joan	n It least	th	Date:	1/4/91
Released by	7 Laborat	ory: /			Date:	
Released by	7:				Date:	

## NOTES TO LABORATORY:

- Notify SCI if there are any anomalous peaks on GC or other scans

- Questions/clarifications - Contact SCI at (415) 268-0461

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

#### CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Nam	ne:	1347	effector	<u>, Gi</u>	N	
SCI Job Num	mber:	<u></u>	430. C	13		
Project Cor	ntact at S	scI:	Segn (	Cerse	)   ]	
Sampled By:	•				lelez	
Analytical	Laborato	:y:	Curt	ns + T	omplains	)
Analytical	Turnarou	nd:				
Sample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	SamplingDate	Hold	Analysis	Analytical Method
47	$\underline{\mathcal{W}}$	V.5	3,13/91		TVH/BTXX	
48	$\sim$	X*5 6*2	3/13/91		TVH/BTXE VOCS	TEH + O+G 8010
49	$\overline{\mathcal{W}}$	V.5	3/13/91		TVH/BDX	5015/2020/503
51	$\underline{W}$	V.Z	3/13/91		IVH/3TX	
52	$\underline{-\mathcal{W}}$	V*Z	3/13/91	<del></del>	TVH/BIXE TVH/BIX	
_53_	<u></u>	Vx8 Px	3/13/91		TVH/BTX	D <u>R</u>
_54_	<u>~~</u>	V.8 P.1		<del></del>	vol: E	B retiteda
_59_	$\overline{\mathcal{W}}$	V*5	3/13/91	· <del></del>	TVH/BJM	
	* /·.)	**		. / /-		*
Released b	y: faw	Rece	ived by:	<u> </u>		
Released b		<del></del>	ived by:		Date: _	2 1:216
Received b	y Laborat	ory: Zo-	5-		Date: _	3/13/91
Released b	y Laborat	ory:	· · · · · · · · · · · · · · · · · · ·		Date:	
Released b	у:				Date: _	
		_ <del></del>				

#### NOTES TO LABORATORY:

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

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

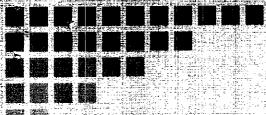
# CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name:	3th + Jeffe	NOZY	6W	
SCI Job Number:	1120	013		
		0.10 CE	arson	
Project Contact at SCI:				
Sampled By:		Jairo	Lopez	
Sampled By: Analytical Laboratory: Analytical Turnaround:		-urtis	+ Tomph	Cins
Analytical Turnaround:		Ī	apid	
Sample Contain Sample ID Type <sup>1</sup> Type <sup>2</sup>	er Sampling	Hold		Analytical Method
MW-59 W V.3	4/3/91		V∞ 3	EPA 8010
	<u> </u>			
		<del></del>	184	<del></del>
		<del></del>		
*	* *		*	*
(40/11/2	Received by:		Date:	04-03-91
	Received by:		Date:	
Received by Laboratory:	Frutt		Date:	4391 14.00
Released by Laboratory:	J - 1		Date:	
Released by:			Date:	

# NOTES TO LABORATORY:

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

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



January 29, 1992 SCI 430.014

Mr. Paul Smith Alameda County Health Cara Services Agency 80 Swan Way, Room 200 Oakland, California 94621 577D 362-3

City of Oakland Old Firehouse

Quarterly Groundwater Monitoring Floor Drain Sump |3th and Jefferson Streets | Oakland: California

Dear Mr. Smith:

This letter records the results of the June, September and December 1991 groundwater sampling and analytical testing events performed by Subsurface Consultants, Inc. (SCI) for the consultants at the referenced site. Well locations are shown on the attached Site Plan, Plate 1.

# Background

SCI previously documented the removal of a concrete floor drain sump and associated contaminated soils in a report dated September 24, 1990. A groundwater Contamination Assessment report by SCI dated July 8, 1991, presents the monitoring well installation details and the results of previous sampling events. SCI submitted a remediation plan to Alameda County Health Care Services Agency (ACHCSA) on July 9, 1991. The letter described Semistroment to remediate beginning and the results of productions to summe the contamination of the semistroment of the semistrome

# Quarterly Monitoring

Groundwater levels in the wells were measured on June 13, September 11, and December 12, 1991. The groundwater level measurements, including previous readings, are summarized in Table 1:

DCA = 1,2-Dichloroethane

92 JAN 30 AR II: 04

Subsurface Consultants, Inc.

Mr. Paul Smith Alameda County Health Care Services Agency January 29, 1992 SCI 436,014 Page 2

Prior to sampling, the wells were purged of at least 4 well volumes of water using a Teflon baller. The purged water was disposed of in the existing groundwater treatment plant on-site.

The water samples were retained in pre-cleaned containers, placed in an iced cooler, and kept refrigerated until delivery to the analytical laboratory. The samples were accompanied by chain-of-custody records, copies of which are attached.

Analytical testing was performed by Curtis & Tompkins, Ltd., a State of California Department of Mealth Services certified analytical laboratory for the tests performed. Water samples were analytically tested for the following:

- Total volatile hydrocarbons (TVH), sample preparation and analysis using EPA Method 5030 (purge and trap extraction) and 8015 (gas chromatograph coupled to a flame ionization detector);
- Benzene, toluene, xylene and ethylbenzene (BTXE), sample preparation and analysis using EPA Method 5030 and 8020 (gas chromatograph coupled to a photo-ionization detector);
- Total extractable hydrocarbons (TEH), sample preparation and analysis using EPA Methods 3550 (sonication) and 8015 (modified gas chromatograph coupled to a flame ionization detector);
- 4. Hydrocarbon Oil and Grease (DEG), sample preparation and analysis using SMNN 17:5520 EEF; and
- 5. Volatile organic chemicals (EPA 8010), sample preparation and analysis using EPA method 5030 (purge and trap) and 8010 (gas chromatograph coupled to an electrolytic conductivity detector).

TVH and BTXE analyses were performed on the samples to monitor for the presence of gasoline contamination from another source. The results of the analyses are summarized in Tables 2 and 3. Copies of the analytical test reports are attached.

# Conclusions

The groundwater flow direction has changed significantly during the last quarter. Groundwater is currently flowing toward the southwest. The change is a result of construction dewatering at the City Center Garage 2 site located between 12th and 13th

Mr. Paul Smith Alameda County Health Care Services Agency January 29, 1992 SCI 430,014 Page 3

Streets, and Martin Luther King Jr. Way and Jefferson Street. Construction dewatering began on November 11, 1991 and will reportedly continue until mid-February 1992.

The most recent analytical test results indicate that 16 ug/L of 1.2-DCA is present in groundwater obtained from Well 48. This concentration is consistent with previous analytical data. Well 48 is the well closest to the former floor drain sump. DCA was not detected in any other wells during this sampling event at concentrations in excess of analytical detection limits. There is no indication that the DCA plume is migrating significantly down gradient, as Well 59 remains free of detectable concentrations of DCA contamination.

As stated previously, the groundwater flow direction has changed significantly during the last quarter. We understand that the condition is temporary. Once dewatering is halted, we anticipate that the flow direction will return to that previously documented. If plans change and construction dewatering continues for a longer period of time, it may be appropriate to modify our monitoring program.

None of the wells being monitored contain hydrocarbon contamination at concentrations in excess of analytical detection limits. We recommend that monitoring for volatile organic chemicals (EPA 8010) 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)

SOC:JPB:vb

amm

Mr. Paul Smith
Alameda County Health Care Services Agency
January 29, 1992
SCI 430,014
Page 4

Attachments: Table 1 - Groundwater Elevation Data

Table 2 - Halogenated Volatile Organic Chemical

Concentrations in Groundwater

Table 3 - Petroleum Hydrocarbon Concentrations in

Groundwater -

Plate 1 - Site Plan Chain-of-Custody Records Analytical Test Reports

1 copy: Ms. Lois Parr

Cakland Redevelopment Agency 1333 Broadway, Suite 900 Cakland, California 94512

1 copy: Mr. John Esposito

Bramalea Pacific

1111 Broadway, Suite 1400 Oakland, California 94607

1 copy: Mr. Eddy So

Regional Water Quality Control Board

2101 Webster Street, Room 500 Oakland, California 94612

1 copy: Mr. Dennell Chey

City of Cakland

505 14th Street, 12th Ploor Oakland, California 94612

Table 1. Groundwater Klevation Data

Well	Date	TOC <sup>1</sup> Elevation (ft)	Groundwater Depth <sup>2</sup> (ft)	Groundwater Elevation (ft)
MW-47	09/24/90	100.50	27.28	73.22
L1442.1	10/04/90		27.32	73.18
	12/03/90		27.38	73.12
	01/21/91		27.17	73.33
	03/13/91		26.85	73.65
	04/03/91		26.38	74.12
	06/13/91		28.39	72.11 73.42
	09/10/91		27.08	73.42 72.55
	12/12/91		27.95	
MW-48	07/18/90	102.40	29.08	73.32 73.11
	10/04/90		29.29 29.28	73.12
	12/03/90		29.20	73.37
	01/21/91		28.72	73.68
	03/13/91		28.24	74.16
	04/03/91 06/13/91		29.47	72.93
	09/10/91		28.94	73.46
	12/12/91		30.39	72.01
MW-49	12/03/90	101.73	28.44	73.29
114-32	01/21/91		28.20	73.53
	03/13/91		27.79	73.94
	04/03/91		27.28	74.45
	06/13/91		27.66	74.07
	09/10/91		28.04	73.69 71.28
	12/12/91		30.45	
MW-51	10/04/90	102.64	28.57	74.07
	12/03/90		28.57	74.07 74.20
	01/21/91		28.44 27.76	74.20 74.88
	03/13/91		27.76	75.32
	04/03/91		28.82	73.82
	06/13/9 <b>1</b> 09/10/91		28.00	74.64
MW-52	10/04/90	102.44	28.41	74.03
PIN 32	12/03/90		28.38	74.06
	01/21/91		28.24	74.20
	03/13/91		27.57	74.87
	04/03/91		27.16	75.28
	06/13/91		29.41	73.03
	09/10/91		27.85	74.59
MW53	09/24/90	101.28	27.44	73.84
	10/04/90		27.50	73.78
	12/03/90		27.46	73.82 73.28
	01/21/91		28.00 27.00	74.28
	03/13/91		27.61	73.67
	06/13/91	Well Abandoned	27.01	, 0.0.
	08/12/91			
MW54	09/24/90	100.78	27.01	73.77
•	10/04/90		27.30	73.48
	12/03/90		27.01	73.77
	01/21/91	101.92 <sup>3</sup>	27.28	74.64 74.52
	03/13/91	101.92	27.40 28.93	72.99
	06/13/91		27.66	74.26
	09/10/91 12/12/91		28.88	73.04
MW59	02/12/91	100.37	27.45	72.92
19 <del>14 3</del> 3	03/13/91		27.60	72.77
	04/03/91		27.36	73.01
	06/13/91		28.01	72.36
	09/10/91		28.00	72.37
	12/12/91		28.53	71.84

Assumed datum: The elevation of the PG&E manhole in Martin Luther King, Jr. Way, near the northwest corner of the block, was assumed to have an elevation of 100 feet (see Plate 1)

Top of Casing Depth measured below top of casing Well head damaged and repaired

Table 2. Petroleum Hydrocarbon Concentrations in Groundwater

Well	Date	06G <sup>1</sup> (ug/L)	TVH <sup>2</sup> (ug/L)	TKH <sup>3</sup> (ug/L)	B <sup>4</sup> (ug/L)	T <sup>5</sup> (ug/L)	X <sup>6</sup> (ug/L)	K <sup>7</sup> (ug/L)
<u> </u>	2456	<u> </u>				-		
MW-47	04/06/90		ND <sup>8</sup>		ND	ND	ND	ND
	10/04/90				ND	ND	ND	ND
	12/03/90		ND		ND	ND	ND	ND
	03/13/91		ND		ND	ND	ND	ND
	06/13/91		ND		ND	ND	ND	ND
	09/11/91		ND		ND	ND	ND	ND
	12/12/91		ND		ND	ND	ND	ДИ
MW-48	04/06/90		ND		ND	ND	ND	ND
	07/18/90	ND	ND	ND	ND	ND	ND	ND
	10/04/90			110	ND	ND	ND	ND
	12/03/90	ND	ND	ND	ND	ND	ND	ND
	03/13/91	ND	ND	ND	ND	ND	ND	. ND
	09/11/91	ND	ND	ND	ND	ND	ND	ND
•	12/12/91	ND	ND	ND	ND	ND	ND	ND
MW-49	04/06/90		ND		ND	ND	ND	ND
	12/03/90		ND		ND	ND	ND	ND
	03/13/91		ND		ND	ND	ND	ND
	06/13/91		ND		ND	ND	ND	ND
	09/11/91		ND		ND	ND	ND	αи
	12/12/91		ND		ND	ND	ND	ND
MW-51	04/06/90		ND		ND	ND	ND	ND
17H 31	10/04/90				ND	ND	ND	ND
	12/04/90		ND		ND	ND	ND	ND
	03/13/91		ND		ND	ND	ND	ИD
	06/13/91		ND		ND	ND	ND	ND
	09/11/91		NĎ		ND	ND	ND	ND
	04.405.400		ND		ND	ND	ND	ND
MW-52	04/06/90				ND	ND	ND	ND
	10/04/90		ND		ND	ND	ND	ND
	12/04/90		ND		ND	ND	ND	ND
	03/13/91		ND		ND	ND	ND	ND
	06/13/91		ND		ND	ND	ND	ND
	09/11/91		MD		.40			
MW53	09/21/90		ND		ND	ND	ND	ND
	10/04/90		ND		ND	ND	ND	ND
	12/04/90		ND		ND	ND	ND	ND
	03/13/91		ND		ND	ND	ND	ND
	06/11/91		ND		ND	ND	ND	ND
	08/12/91	Well A	Abandoned					
MW54	09/21/90		1700		ND	1.5	20	1.9
	10/04/90		1300		ND	0.7	12	28
	12/04/90		ND		ND	ND	ND	ND
	03/13/91		ND		ND	ND	ND	ND
	06/13/91		ND		ND	ND	ND	ИD
	09/11/91		ND		ND	ND	ND	ND
	12/12/91		ND		ND	ND	ND	ND
MW59	03/13/91		ND		ND	ND	ND	ND

Oil and Grease Total Volatile Hydrocarbons Total Extractable Hydrocarbons

Benzene

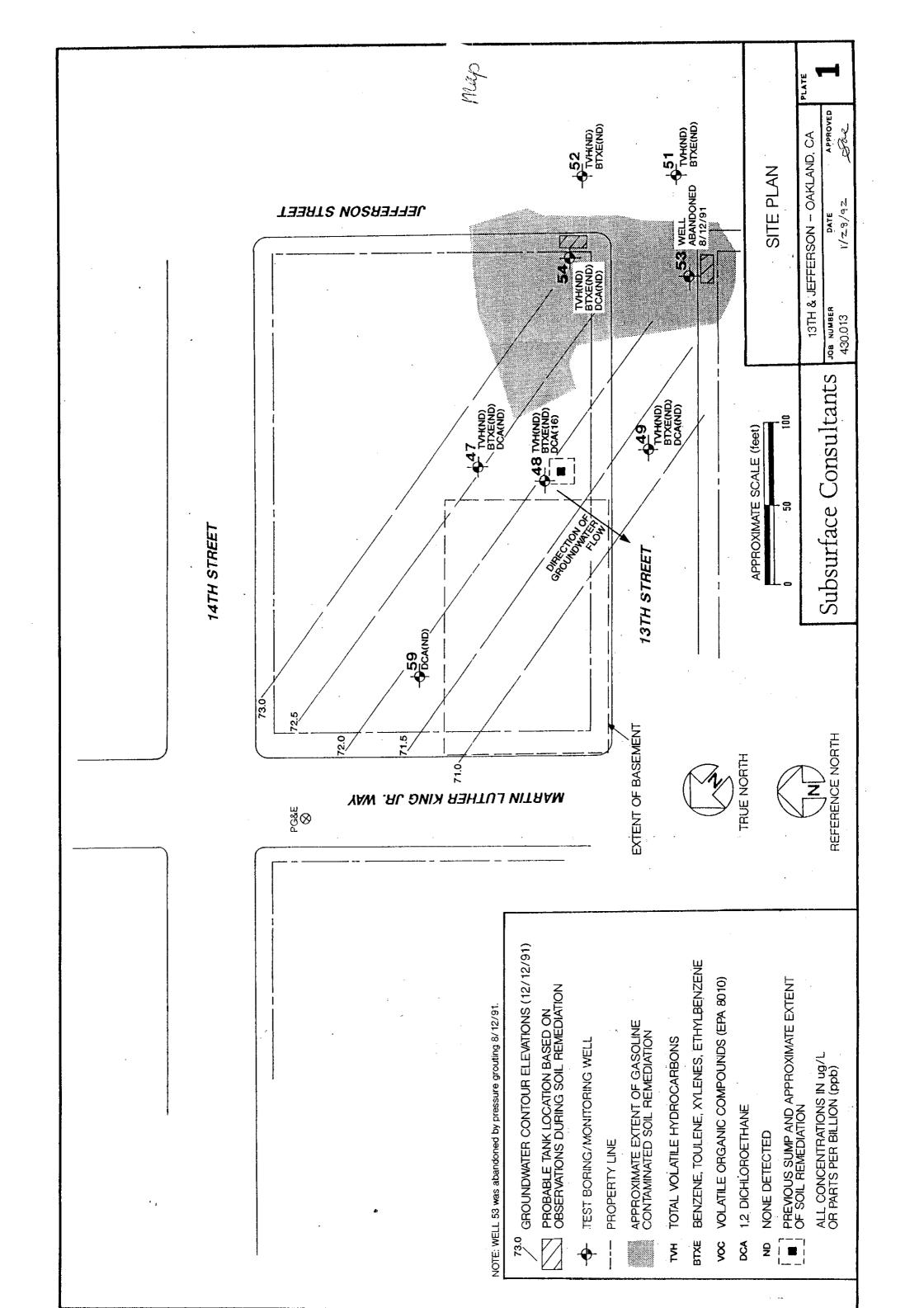
Toluene

Xylene
Ethylbenzene
ND = Non-detectable, see analytical test reports for detection limits

Table 3. Halogenated Volatile Organic Chemical Concentrations in Groundwater

Concentrations in Groundwater					
Well	Date	1,2 DCA <sup>1</sup> (ug/L) <sup>3</sup>	1.2 DCK <sup>2</sup> (ug/L)	Chloroform (ug/L)	Other EPA 8010 (ug/L)
MW-29	01/04/91	$\mathtt{ND}^{4}$	ND	ND	ND
MW-31	01/04/91	ND	ИО	10	ND
MW-45	01/04/91	ND	ND	ND	ND
MW-46	01/04/91	ИО	ND	ND	ND
MW-47	12/03/90	ND	11	ND	ND
	01/04/91	16	ND	ND	ND
	03/13/91	6.7	ND	ND	ND
	06/13/91	ND	ND	ND	ND
		ND	ND	ND	ND
	09/11/91		ND	ND	ND
	12/12/91	ND	טא	ND	ND
MW48	10/04/90	60	ND	ND	ND
1114 40	12/03/90	31	ND	ND	ND
	01/04/91	15	ND	ND	ND
		30	ND	ND	ND
	03/13/91		ND	ND	ND
	06/19/91	6.1		ND	ND
	09/11/91	5.3	ND		ND
	12/12/91	16	ND	ND	ND
MW49	12/03/90	ND	ND	ND	ND
1/14 4 >	03/03/91	ND	ND	ND	ND
	06/13/91	5.0	ND	ND	ND
		ND	ND	ND	ND
	09/11/91 12/12/91	ND	ND	ND	ND
	12/12/31	110	.,		
MW51	12/04/90	ND	ND	ND	ИD
,	06/13/91	ND	ND	1.0	ND
			ME	1.3	ND
MW - 52	12/04/90	ND	ND		ND
	06/13/91	ND	ND	2.0	ND
M₩53	10/04/90	ND	ND	1.2	ND
1114 55	12/04/90	ND	ND	1.9	ND
	03/13/91	ND	ND	2.0	ND
	06/13/91	ND	ND	8.0	ND
		Well abandoned	ND	0.0	
	08/12/91	well abandoned			
MW-54	10/04/90	ND	ND	1.6	מא
02	12/04/90	ND	ND	1.5	ND
	01/04/91	ND	ND	ND	ND
	03/13/91	ND	ND	ND	ND
	06/13/91	ND	ND	1.0	ND
	00/13/31	***	<del>-</del>		
MW~59	03/13/91	ND	ND	ИD	ND
	04/03/91	ND	ОN	ND	ND
	09/11/91	ND	ND	ND	ND
	12/12/91	ND	ND	ND	ND
	,,				

<sup>1,2</sup> Dichloroethane
1,2 Dichloroethene
Micrograms/liter = parts per billion
None detected, see test reports for detection limits





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

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

DATE RECEIVED: 06/13/91 DATE REPORTED: 06/27/91

LAB NUMBER: 104126

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.013

LOCATION: 13th & JEFFERSON GW

RESULTS: SEE ATTACHED

QA/QC Approval

Fina

Los Angeles



LABORATORY NUMBER: 104126

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.013

LOCATION: 13th & JEFFERSON GW

DATE RECEIVED: 06/13/91
DATE ANALYZED: 06/22/91
DATE REPORTED: 06/27/91

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	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES
		(ug/L)	( u g / L )	(ug/L)	(ug/L)	(ug/L)
104126-1	47	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0,5)
104126-2	4 9	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
104126-3	5 1	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
104126-4	5 2	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
104126-5	53	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
104126-6	5 4	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.



DATE RECEIVED: 06/13/91 LABORATORY NUMBER: 104126-1 DATE ANALYZED: 06/19/91 CLIENT: SUBSURFACE CONSULTANTS DATE REPORTED: 06/27/91

PROJECT ID: 430.013

LOCATION: 13th & JEFFERSON GW

SAMPLE ID: 47

EPA 8010

Purgeable Halocarbons in Water

Compound	Result ug/L ND	Reporting Limit ug/L 2.0
chloromethane	ND	2.0
bromome than e	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
l, l-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	NĐ	1.0
chloroform	ND	1.0
freon 113	ND	1.0
l, 2-dichloroethane	ND	1.0
l, l, l-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodich lorome than e	ND	1.0
l, 2 - dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
l, l, 2 - trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	2.0
2-chloroethyl vinyl ether	ND	1.0
bromo form	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
l, 4-dichiorobenzene	<b>-</b> · -	

ND = Not detected at or above reporting limit.

QA/QC	SUMMARY
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5 RPD, % 103 



DATE ANALYZED: 06/19/91

DATE REPORTED: 06/27/91

LABORATORY NUMBER: 104126-2 CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.013

LOCATION: 13th & JEFFERSON GW

SAMPLE ID: 49

EPA 8010

Purgeable Halocarbons in Water

Company	Result	Reporting
Compound	ug/L	Limit
		ug/L
11 .41.000	ND	2.0
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	1.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	5.0	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachioride	ND	1.0
bromodich lorome than e	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
l, l, 2 - trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND ND	2,0
2-chloroethyl vinyl ether	ND ND	1.0
bromoform		1.0
tetrachloroethene	ND ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

# QA/QC SUMMARY

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RPD, %	103
RECOVERY, %	

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DATE RECEIVED: 06/13/91 LABORATORY NUMBER: 104126-3 DATE ANALYZED: 06/19/91 CLIENT: SUBSURFACE CONSULTANTS DATE REPORTED: 06/27/91

PROJECT ID: 430.013

LOCATION: 13th & JEFFERSON GW

SAMPLE ID: 51

EPA 8010

Purgeable Halocarbons in Water

Compound	Result	Reporting
00mp	ug/L	Limit
		ug/L
chloromethane	ND	2.0
hromomet bane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
	ND	1.0
l, l-dichloroethane cis-l, 2-dichloroethene	ND	1.0
	ND	1.0
trans-1, 2-dichloroethene	1.0	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	<b>1</b> . $0$
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane		1.0
trans-1,3-dichloropropene	ND	1.0
d i bromo ch l o rome than e	ND	2.0
2-chloroethyl vinyl ether	ND	
bromo form	ND	1.0
tetrachloroethene	ND	$\frac{1}{1} \cdot \frac{0}{0}$
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
l,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
l, 4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

# QA/QC SUMMARY

5 RPD, % 103 RECOVERY, % 



DATE RECEIVED: 06/13/91 LABORATORY NUMBER: 104126-4 CLIENT: SUBSURFACE CONSULTANTS DATE ANALYZED: 06/19/91 DATE REPORTED: 06/27/91

PROJECT ID: 430.013

LOCATION: 13th & JEFFERSON GW

SAMPLE ID: 52

## EPA 8010 Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromome than e	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
l, l-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1, 2-dichloroethene	ND	1.0
	ND	1.0
trans - 1, 2 - dichloroethene	2.0	1.0
chloroform	ND	1.0
freen 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	2.0
2-chloroethyl vinyl ether	ND	1.0
bromo form	ND	1.0
tetrachloroethene	ND ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene		1.0
1,3-dichlorobenzene	ND ND	1.0
l, 2-dichlorobenzene	ND ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

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#### OA/OC SUMMARY

RPD. %	5
RECOVERY, %	103
RECOVERT, //	



DATE ANALYZED: 06/19/91

DATE REPORTED: 06/27/91

LABORATORY NUMBER: 104126-5 CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.013

LOCATION: 13th & JEFFERSON GW

SAMPLE ID: 53

#### EPA 8010

Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane bromomethane vinyl chloride chloroethane methylene chloride trichlorofluoromethane 1,1-dichloroethene	ND ND ND ND ND ND ND	2.0 2.0 2.0 2.0 2.0 1.0 1.0
<pre>1,l-dichloroethane cis-l,2-dichloroethene trans-l,2-dichloroethene chloroform freon 113 1,2-dichloroethane 1,i,l-trichloroethane carbon tetrachloride bromodichloromethane</pre>	ND ND 8.0 ND	1.0 1.0 1.0 1.0 1.0 1.0 1.0
1,2-dichloropropane cis-1,3-dichloropropene trichloroethylene 1,1,2-trichloroethane trans-1,3-dichloropropene dibromochloromethane 2-chloroethyl vinyl ether bromoform	ND	1.0 1.0 1.0 1.0 1.0 2.0
tetrachloroethene 1,1,2,2-tetrachloroethane chlorobenzene 1,3-dichlorobenzene 1,2-dichlorobenzene 1,4-dichlorobenzene	ND ND ND ND ND	1.0 1.0 1.0 1.0

ND = Not detected at or above reporting limit.

# QA/QC SUMMARY

5 RPD, % 103 RECOVERY, % 



DATE ANALYZED: 06/19/91

DATE REPORTED: 06/27/91

LABORATORY NUMBER: 104126-6 CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.013

LOCATION: 13th & JEFFERSON GW

SAMPLE ID: 54

EPA 8010

Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane bromomethane	ND ND ND	2.0 2.0 2.0
vinyl chloride chloroethane	ND ND	2.0 2.0
methylene chloride trichlorofluoromethane	ND ND	$egin{array}{c} 1 \ . \ 0 \\ 1 \ . \ 0 \end{array}$
l, l-dichloroethene l, l-dichloroethane cis-l, 2-dichloroethene	ND ND	1.0
trans-1,2-dichloroethene chloroform	ND ND 1.0	1.0 1.0 1.0
freon 113 1,2-dichloroethane	ND ND	1.0
l, l, l-trichloroethane carbon tetrachloride bromodichloromethane	ND ND	$egin{array}{c} 1 \cdot 0 \\ 1 \cdot 0 \end{array}$
1, 2-dichloropropane cis-1, 3-dichloropropene	ND ND	1.0
trichloroethylene 1,1,2-trichloroethane	ND ND ND	$egin{array}{ccc} 1 & . & 0 \\ 1 & . & 0 \\ 1 & . & 0 \end{array}$
trans-1,3-dichloropropene dibromochloromethane	ND ND	1.0 2.0
2-chloroethyl vinyl ether bromoform tetrachloroethene	ND ND	$\begin{smallmatrix}1&.&0\\1&.&0\end{smallmatrix}$
1,1,2,2-tetrachloroethane chlorobenzene	ND ND	1.0
i, 3-dichlorobenzene l, 2-dichlorobenzene l, 4-dichlorobenzene	ND ND	1 . 0 1 . 0 1 . 0
1, 4-titulo obenzeno		

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

5 RPD, % 103 RECOVERY, % 

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DATE ANALYZED: 06/19/91

DATE REPORTED: 06/27/91 DATE REVISED: 09/27/91

LABORATORY NUMBER: 104126-6 CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.013

LOCATION: 13th & JEFFERSON GW

SAMPLE ID: 54

EPA 8010

Purgeable Halocarbons in Water

Compound	Result	Reporting
	ug/L	Limit
		ug/L
ch loromethan e	ND	2.0
bromome than e	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
l, l-dichloroethene	ND	1.0
l, I - dichloroethane	ND	1.0
eis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	1.0	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	.ND	1.0
carbon tetrachloride	ND	1.0
bromodich loromethane	ND	1.0
1,2-dichloropropane	ND.	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
I, 1, 2 - trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachforoethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
l, 4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

RPD %

RPD, %
RECOVERY, %
103



DATE RECEIVED: 06/13/91 LABORATORY NUMBER: 104126-7 DATE ANALYZED: 06/19/91 CLIENT: SUBSURFACE CONSULTANTS DATE REPORTED: 06/27/91

PROJECT ID: 430.013

LOCATION: 13th & JEFFERSON GW

SAMPLE ID: 59

# EPA 8010 Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit ug/L
chloromethane	ND	2.0
bromomethane	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
l, l-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1, 2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	$\overline{1}$ . $\overline{0}$
	ND	1.0
1,2-dichloroethane	ND	1.0
l,l,l-trichloroethane carbon tetrachloride	ND	$\tilde{1}$ , $\tilde{0}$
bromodichloromethane	ND	$\frac{1}{1}$ . $0$
	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	$\stackrel{-}{1}$ , $\stackrel{-}{0}$
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans - 1, 3 - dichloropropene dibromochloromethane	ND	1.0
	ND	2.0
2-chloroethyl vinyl ether	ND	$\frac{1}{1}$ . 0
bromoform	ND	$\stackrel{-}{1}$ . $\stackrel{-}{0}$
tetrachloroethene	ND	$\stackrel{-}{1}$ . $\stackrel{-}{0}$
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1, 2-dichlorobenzene	ND	1.0
l, 4-dichlorobenzene	MD	* • •

ND = Not detected at or above reporting limit.

# QA/QC SUMMARY

5 RPD, % 103RECOVERY, %



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

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

DATE RECEIVED: 09/11/91 DATE REPORTED: 09/17/91

LABORATORY NUMBER: 105131

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.013

LOCATION: 13TH & JEFFERSON

RESULTS: SEE ATTACHED

QA/QC Approval

Fina

Los Angeles



LABORATORY NUMBER: 105131

CLIENT: SUBSURFACE CONSULTANTS, INC.

PROJECT ID: 430.013

LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 09/11/91 DATE ANALYZED: 09/14/91

DATE REPORTED: 09/17/91

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 I	D TVH AS GASOLINE	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES
		( u g / L )	(ug/L)	(ug/L)	(ug/L)	(ug/L)
			,			
105131-1	MW - 47	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
105131-2	MW - 48	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
105131-3	MW - 49	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
105131-4	MW - 51	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
105131-5	MW - 5 2	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
105131-6	MW - 54	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, %	95



Client: Subsurface Consultants Laboratory Login Number: 105131

Project Name: 13th & Jefferson GW

Project Number: 430.013

Report Date: 17 September 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) METHOD: SMWW 17:5520BF

Lab ID	Sample ID Mat	rix Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
					1. 1.				
05131-002	MV-48 Wat	er 10-SEP-91	11-SEP-91	16-SEP-91	ND	mg/L	5	ΪR	264
					. 1000 1000. 100 100 100 100 100 100 100 100 100 100				
					ta 5				
					44				
					Asiaile Santa				
					44604.019 - 84897 -				
					AND S				
					70.4 44.4 44.4				
					12 460 12 480 14 6445				

 $\mbox{ND}$  = Not Detected at or above Reporting Limit (RL).



#### QC Batch Report

Client:

Subsurface Consultants

Project Name: 13th & Jefferson GW

Project Number: 430.013

Laboratory Login Number: 105131

Report Date: 17 September 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) QC Batch Number: 2641

Blank Results

Sample ID Result MDL Units Method Date Analyzed

BLANK ND 5 mg/L SMWW 17:5520BF

16-SEP-91

Spike/Duplicate Results

Sample ID Recovery

Method

Date Analyzed

BS

SMWW 17:5520BF

16-SEP-91

BSD

89%

91%

SMWW 17:5520BF

16-SEP-91

Average Spike Recovery 90% Relative Percent Difference 2.1%

Control Limits 80% - 120%

< 20%



LABORATORY NUMBER: 105131

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.013

LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 09/11/91 DATE EXTRACTED: 09/12/91

DATE ANALYZED: 09/15/91 DATE REPORTED: 09/17/91

Extractable Petroleum Hydrocarbons in Aqueous Solutions
California DOHS Method
LUFT Manual October 1989

LAB ID S	SAMPLE ID	KEROSENE RANGE (ug/L)	DIESEL RANGE (ug/L)	REPORTING LIMIT* (ug/L)
105131-2 N	AW - 48	ND	ND	5 0

ND = Not Detected at or above reporting limit.

\*Reporting limit applies to all analytes.

#### QA/QC SUMMARY



DATE RECEIVED: 09/11/91 LABORATORY NUMBER: 105131-1 DATE ANALYZED: 09/13/91 CLIENT: SUBSURFACE CONSULTANTS DATE REPORTED: 09/17/91

PROJECT ID: 430.013

LOCATION: 13TH & JEFFERSON

SAMPLE ID: MW-47

#### EPA 8010 Purgeable Halocarbons in Water

Compound	Result	Reporting
•	ug/L	Limit
	-	ug/L
ch lor ome than e	ND	2.0
bromome than e	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
l, l-dichloroethene	ND	1.0
l, I-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
I, 2-dichloroethane	ND	1.0
I, I, I-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodich loromethane	ND	1.0
l, 2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
d i bromo ch l o rome than e	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
l, l, 2, 2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

	=======================================
RPD, %	23
RECOVERY, %	9 2



DATE RECEIVED: 09/11/91

DATE ANALYZED: 09/13/91

DATE REPORTED: 09/17/91

LABORATORY NUMBER: 105131-2 CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.013

LOCATION: 13TH & JEFFERSON

SAMPLE ID: MW-48

EPA 8010

#### Purgeable Halocarbons in Water

Compound	Result	Reporting
	ug/L	Limit
		ug/L
ch lor ome than e	ND	2.0
bromome than e	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
l, l-dichloroethene	ND	1.0
l, l-dichloroethane	ND	1,0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	5.3	1.0
l, l, l-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodich loromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
l, 4-dichlorobenzene	ND	1.0
•		

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

	.=========
RPD, %	23
RECOVERY, %	9 2

and the second s



LABORATORY NUMBER: 105131-3 DATE RECEIVED: 09/11/91 DATE ANALYZED: 09/13/91 CLIENT: SUBSURFACE CONSULTANTS DATE REPORTED: 09/17/91

PROJECT ID: 430.013

LOCATION: 13TH & JEFFERSON

SAMPLE ID: MW-49

#### EPA 8010 Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit
		ug/L
chloromethane	ND	2.0
bromome than e	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
l, l-dichloroethene	ND	1.0
l, l-dichloroethane	ND	1.0
cis-l,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
l, l, l-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
l, 4 - dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

RPD, %	2 3
RECOVERY, %	9 2



DATE RECEIVED: 09/11/91

DATE ANALYZED: 09/13/91 DATE REPORTED: 09/17/91

LABORATORY NUMBER: 105131-7

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.013

LOCATION: 13TH & JEFFERSON

SAMPLE ID: MW-59

EPA 8010

Purgeable Halocarbons in Water

Compound	Result	Reporting
•	ug/L	Limit
		ug/L
chloromethane	ND	2.0
bromome than e	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
l, l-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodich loromethane	ND	1.0
I, 2-dichloropropane	ND	1.0
cis-l,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromoch loromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
l, l, 2, 2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
l, 4 - dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

=======================================	=========
RPD, %	23
RECOVERY, %	9 2
	========



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

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

DATE RECEIVED: 12/12/91 DATE REPORTED: 12/23/91

LABORATORY NUMBER: 106030

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.013

LOCATION: 13TH & JEFFERSON GW

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approval

Wilmington

Los Angeles



Client: Subsurface Consultants

Laboratory Login Number: 106030

Project Name: 13th & Jefferson GW

Report Date: 23 December 91

Project Number: 430.013

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) METHOD: SMWW 17:5520BF

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
106030-002	M¥-48	Water	12-DEC-91	12-DEC-91	18-DEC-91	ND	mg/L	5	TR	3711
		: :								
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		1:								
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						1.00000				
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		• .								
		i La								
		Ģe								

 ${\tt ND}$  = Not Detected at or above Reporting Limit (RL).



#### QC Batch Report

Client: Subsurface Consultants
Project Name: 13th & Jefferson GW

Project Number: 430.013

Laboratory Login Number: 106030

Report Date: 23 December 91

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric) QC Batch Number: 3711

Blank Results

Sample ID Result MDL Units Method

Date Analyzed

3LANK ND 5 mg/L SMWW 17:5520BF 18-DEC-91

Spike/Duplicate Results

Sample ID Recovery

Method

Date Analyzed

BS

89%

SMWW 17:5520BF 18-DEC-91 SMWW 17:5520BF 18-DEC-91

BSD

85%

Control Limits

Average Spike Recovery Relative Percent Difference 4.5%

87%

80% - 120% < 20%



LABORATORY NUMBER: 106030

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.012

LOCATION: 13TH & JEFFERSON GW

DATE RECEIVED: 12/12/91
DATE EXTRACTED: 12/18/91

DATE EXTRACTED: 12/18/91 DATE ANALYZED: 12/20/91

DATE REPORTED: 12/23/91

# Extractable Petroleum Hydrocarbons in Aqueous Solutions California DOHS Method LUFT Manual October 1989

LAB ID CLIENT ID	KEROSENE	DIESEL	REPORTING
	RANGE	RANGE	LIMIT*
	( u g / L )	( u g / L )	( u g / L )
106030-2 MW-48	ND	ND	5 0

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

RPD, % 5
RECOVERY, % 119

<sup>\*</sup>Reporting limit applies to all analytes.



LABORATORY NUMBER: 106030

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.013

LOCATION: 13TH & JEFFERSON GW

DATE RECEIVED: 12/12/91 DATE ANALYZED: 12/18/91

DATE REPORTED: 12/23/91

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	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES
			(ug/L)	( u g / L )	( u g / L )	(ug/L)	(ug/L)
106030-1	MW - 47		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
106030-2	MW-48		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
106030-3	MW- 49		ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
106030-4	MW-54		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, %	83



DATE RECEIVED: 12/12/91

DATE ANALYZED: 12/18/91

DATE REPORTED: 12/23/91

LABORATORY NUMBER: 106030-1 CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.013

LOCATION: 13TH & JEFFERSON GW

SAMPLE ID: MW-47

#### EPA 8010 Purgeable Halocarbons in Water

Compound	Result	Reporting
	ug/L	Limit
	* ***	ug/L
Chloromethane	ND	2.0
Bromomethane	ND	2.0
Vinyl chloride	ND	2.0
Chloroethane	ND	2.0
Methylene chloride	ND	1.0
Trichlorofluoromethane	ND	1.0
l, l-Dichloroethene	ND	1.0
I, l-Dichloroethane	ND	1.0
cis-l, 2-Dichloroethene	ND	1.0
trans-1,2-Dichloroethene	ND	1.0
Chloroform	ND	1.0
Freon 113	ND	1.0
1,2-Dichloroethane	ND	1.0
1,1,1-Trichloroethane	ND	1.0
Carbon tetrachloride	ND	1.0
Bromodichloromethane	ND	1.0
1,2-Dichloropropane	ND	1.0
cis-1,3-Dichloropropene	ND	1.0
Trichloroethylene	ND	1.0
1,1,2-Trichloroethane	ND	1.0
trans-1,3-Dichloropropene	ND	1.0
Dibromochloromethane	ND	1.0
2-Chloroethylvinyl ether	ND	2.0
Bromoform	ND	1.0
Tetrachloroethene	ND	1.0
1,1,2,2-Tetrachloroethane	ND	1.0
Chlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0
	ND ND	1.0
l, 4-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

Surrogate Recovery, % 112

, , m.e.



DATE RECEIVED: 12/12/91 LABORATORY NUMBER: 106030-2 DATE ANALYZED: 12/18/91 CLIENT: SUBSURFACE CONSULTANTS PROJECT ID: 430.013 DATE REPORTED: 12/23/91

LOCATION: 13TH & JEFFERSON GW

SAMPLE ID: MW-48

#### EPA 8010 Purgeable Halocarbons in Water

Compound	Result	Reporting
	ug/L	Limit
		ug/L
Chloromethane	ND	2.0
Bromome than e	ND	2.0
Vinyl chloride	ND	2.0
Chloroethane	ND	2.0
Methylene chloride	ND	1.0
Trichlorofivoromethane	ND	1.0
1.1-Dichloroethene	ND	1.0
l, l-Dichloroethane	ND	1.0
cis-1,2-Dichloroethene	ND	1.0
trans · l , 2 - Dichloroethene	ND	1.0
Chloroform	ND	1.0
Freen 113	ND	1.0
1,2-Dichloroethane	16	1.0
1,1,1-Trichloroethane	ND	1.0
Carbon tetrachloride	ND	1.0
Bromodichloromethane	ND	1.0
1,2-Dichloropropane	ND	1.0
cis-1,3-Dichloropropene	ND	1.0
Trichloroethylene	ND	1.0
1,1,2-Trichloroethane	ND	1.0
trans-1,3-Dichloropropene	ND	1.0
Dibromochloromethane	ND	1.0
2-Chloroethylvinyl ether	ND	2.0
Bromoform	ND	1.0
Tetrachloroethene	ND	1.0
l, I, 2, 2-Tetrachloroethane	ND	1.0
Chlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
I, 2-Dichlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

	========
Surrogate Recovery, %	110
	========

The second secon



LABORATORY NUMBER: 106030-3 DATE RECEIVED: 12/12/91 CLIENT: SUBSURFACE CONSULTANTS DATE ANALYZED: 12/18/91 PROJECT ID: 430.013 DATE REPORTED: 12/23/91

LOCATION: 13TH & JEFFERSON GW

SAMPLE ID: MW-49

#### EPA 8010 Purgeable Halocarbons in Water

Compound	Result	Reporting
•	ug/L	Limit
		ug/L
Chloromethane	ND	2.0
Bromome than e	ND	2.0
Vinyl chłoride	ND	2.0
Chlorocthane	ND	2.0
Methylene chloride	ND	1.0
Trichlorofluoromethane	ND	1.0
I, I-Dichloroethene	ND	1.0
l, l-Dichloroethane	ND	1.0
cis-1,2-Dichloroethene	ND	1 . i)
trans-1,2-Dichloroethene	ND	1.0
Chloroform	ND	1.0
Freon 113	ND	1.0
1,2-Dichloroethane	ND	1.0
1,1,1-Trichloroethane	ND	1.0
Carbon tetrachloride	ND	1.0
Bromodichloromethane	ND	1.0
l, 2 - Dichloropropane	ND	1.0
cis-1,3-Dichloropropene	ND	1.0
Trichloroethylene	ND	1.0
1,1,2-Trichloroethane	ND	1.0
trans-1,3-Dichloropropene	ND	1.0
Dibromochloromethane	ND	6.1
2-Chloroethylvinyl ether	ND	2.0
Bromoform	ND	1.0
Tetrachloroethene	ND	1.0
1,1,2,2-Tetrachloroethane	ND	1.0
Chlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

Surrogate Recovery, %	113



DATE RECEIVED: 12/12/91 LABORATORY NUMBER: 106030-5 CLIENT: SUBSURFACE CONSULTANTS DATE ANALYZED: 12/18/91 DATE REPORTED: 12/23/91

PROJECT ID: 430.013

LOCATION: 13TH & JEFFERSON GW

SAMPLE ID: MW-59

#### EPA 8010 Purgeable Halocarbons in Water

Compound	Result	Reporting
•	ug/L	Limit
		ug/L
Chloromethane	ND	2.0
Bromome than e	ND	2.0
Vinyl chloride	ND	2.0
Chloroethane	ND	2.0
Methylene chloride	ND	1.0
Trichlorofluoromethane	ND	1.0
I, l-Dichloroethene	ND	1.0
l, l-Dichloroethane	ND	1.0
cis-1,2-Dichloroethene	ND	1.0
trans-1,2-Dichloroethene	ND	1.0
Chloroform	ND	1.0
Freen 113	ND	1.0
1,2-Dichloroethane	ND	1.0
l, l, l-Trichloroethane	ND	1.0
Carbon tetrachloride	ND	1.0
Bromodichloromethane	ND	1.0
l, 2-Dichloropropane	ND	1.0
cis-1,3-Dichloropropene	ND	1.0
Trichloroethylene	ND	1.0
1,1,2-Trichloroethane	ND	1.0
trans-1,3-Dichloropropene	ND	1.0
Dibromochloromethane	ND	1.0
2-Chloroethylvinyl ether	ND	2.0
Bromoform	ND	1.0
Tetrachloroethene	ND	1.0
l, l, 2, 2-Tetrachloroethane	ND	1.0
Chlorobenzene	ND	1.0
l, 3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0
l, 4-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

Surrogate Recovery, % 112 



LABORATORY NUMBER: 106030 DATE ANALYZED: 12/18/91

CLIENT: SUBSURFACE CONSULTANTS

DATE REPORTED: 12/23/91

PROJECT ID: 430.013

LOCATION: 13TH & JEFFERSON GW

SAMPLE ID: METHOD BLANK

#### EPA 8010

#### Purgeable Halocarbons in Water

Chloromethane	Compound	Result	Reporting
Chloromethane         ND         2.0           Bromomethane         ND         2.0           Vinyl chloride         ND         2.0           Chloroethane         ND         2.0           Methylene chloride         ND         1.0           Trichlorofluoromethane         ND         1.0           i,l-Dichloroethane         ND         1.0           i,l-Dichloroethane         ND         1.0           cis-1,2-Dichloroethane         ND         1.0           trans-1,2-Dichloroethane         ND         1.0           Chloroform         ND         1.0           Freon 113         ND         1.0           1,2-Dichloroethane         ND         1.0           i,1,1-Trichloroethane         ND         1.0           l,2-Dichloropropane         ND         1.0           cis-1,3-Dichloropropane         ND         1.0           cis-1,3-Dichloropropene         ND         1.0           Trichloroethylene         ND         1.0           trans-1,3-Dichloropropene         ND         1.0           trans-1,3-Dichloromethane         ND         1.0           trans-1,3-Dichloropropene         ND         1.0           <		ug/L	Limit
Bromomethane         ND         2.0           Vinyl chloride         ND         2.0           Chloroethane         ND         2.0           Methylene chloride         ND         1.0           Trichlorofluoromethane         ND         1.0           i,l-Dichloroethene         ND         1.0           i,l-Dichloroethane         ND         1.0           cis-1,2-Dichloroethene         ND         1.0           trans-1,2-Dichloroethene         ND         1.0           Chloroform         ND         1.0           Freon 113         ND         1.0           1,2-Dichloroethane         ND         1.0           1,1-Trichloroethane         ND         1.0           Carbon tetrachloride         ND         1.0           Bromodichloromethane         ND         1.0           1,2-Dichloropropane         ND         1.0           cis-1,3-Dichloropropene         ND         1.0           Trichloroethylene         ND         1.0           1,1,2-Trichloroethane         ND         1.0           trans-1,3-Dichloropropene         ND         1.0           Dibromochloromethane         ND         1.0           chlo	•		
Vinyl chloride         ND         2.0           Chloroethane         ND         2.0           Methylene chloride         ND         1.0           Trichlorofluoromethane         ND         1.0           1,1-Dichloroethene         ND         1.0           1,1-Dichloroethane         ND         1.0           cis-1,2-Dichloroethene         ND         1.0           trans-1,2-Dichloroethene         ND         1.0           Chloroform         ND         1.0           Freon 113         ND         1.0           1,2-Dichloroethane         ND         1.0           1,1-Trichloroethane         ND         1.0           Carbon tetrachloride         ND         1.0           Bromodichloromethane         ND         1.0           1,2-Dichloropropane         ND         1.0           cis-1,3-Dichloropropene         ND         1.0           Trichloroethylene         ND         1.0           1,1,2-Trichloroethane         ND         1.0           trans-1,3-Dichloropropene         ND         1.0           Dibromochloromethane         ND         1.0           trans-1,3-Dichloropropene         ND         1.0			
Chloroethane         ND         2.0           Methylene chloride         ND         1.0           Trichlorofluoromethane         ND         1.0           1,1-Dichloroethene         ND         1.0           1,1-Dichloroethane         ND         1.0           cis-1,2-Dichloroethene         ND         1.0           trans-1,2-Dichloroethene         ND         1.0           Chloroform         ND         1.0           Freon 113         ND         1.0           1,2-Dichloroethane         ND         1.0           1,1,1-Trichloroethane         ND         1.0           Carbon tetrachloride         ND         1.0           Bromodichloromethane         ND         1.0           t,2-Dichloropropane         ND         1.0           cis-1,3-Dichloropropene         ND         1.0           Trichloroethylene         ND         1.0           t,1,2-Trichloropethane         ND         1.0           trans-1,3-Dichloropropene         ND         1.0           Dibromochloromethane         ND         1.0           trans-1,3-Dichloropropene         ND         1.0           Bromoform         ND         1.0			
Methylene chloride         ND         1.0           Trichlorofluoromethane         ND         1.0           1,1-Dichloroethene         ND         1.0           1,1-Dichloroethane         ND         1.0           cis-1,2-Dichloroethene         ND         1.0           ctrans-1,2-Dichloroethene         ND         1.0           Chloroform         ND         1.0           Freon 113         ND         1.0           1,2-Dichloroethane         ND         1.0           1,1,1-Trichloroethane         ND         1.0           1,1,1-Trichloroethane         ND         1.0           Bromodichloromethane         ND         1.0           1,2-Dichloropropane         ND         1.0           cis-1,3-Dichloropropene         ND         1.0           Trichloroethylene         ND         1.0           1,1,2-Trichloroethane         ND         1.0           trans-1,3-Dichloropropene         ND         1.0           Dibromochloromethane         ND         1.0           2-Chloroethylvinyl ether         ND         1.0           Bromoform         ND         1.0           Tetrachloroethene         ND         1.0	Vinyl chloride	ND	
Trichlorofluoromethane         ND         1.0           1,1-Dichloroethene         ND         1.0           1,1-Dichloroethane         ND         1.0           cis-1,2-Dichloroethene         ND         1.0           trans-1,2-Dichloroethene         ND         1.0           Chloroform         ND         1.0           Freon 113         ND         1.0           1,2-Dichloroethane         ND         1.0           1,1,1-Trichloroethane         ND         1.0           Carbon tetrachloride         ND         1.0           Bromodichloromethane         ND         1.0           1,2-Dichloropropane         ND         1.0           cis-1,3-Dichloropropene         ND         1.0           Trichloroethylene         ND         1.0           1,1,2-Trichloroethane         ND         1.0           trans-1,3-Dichloropropene         ND         1.0           Dibromochloromethane         ND         1.0           2-Chloroethylvinyl ether         ND         1.0           Bromoform         ND         1.0           Tetrachloroethene         ND         1.0           1,1,2,2-Tetrachloroethane         ND         1.0	Chloroethane	ND	2.0
1,1-Dichloroethane       ND       1.0         1,1-Dichloroethane       ND       1.0         cis-1,2-Dichloroethene       ND       1.0         trans-1,2-Dichloroethene       ND       1.0         Chloroform       ND       1.0         Freon 113       ND       1.0         1,2-Dichloroethane       ND       1.0         1,1,1-Trichloroethane       ND       1.0         1,1,1-Trichloroethane       ND       1.0         Carbon tetrachloride       ND       1.0         Bromodichloromethane       ND       1.0         1,2-Dichloropropane       ND       1.0         cis-1,3-Dichloropropene       ND       1.0         Trichloroethylene       ND       1.0         1,1,2-Trichloroethane       ND       1.0         trans-1,3-Dichloropropene       ND       1.0         Dibromochloromethane       ND       1.0         2-Chloroethylvinyl ether       ND       1.0         Bromoform       ND       1.0         Tetrachloroethene       ND       1.0         1,1,2,2-Tetrachloroethane       ND       1.0         Chlorobenzene       ND       1.0         1,3-Dichlorobenze	Methylene chloride	ND	1.0
1,1-Dichloroethane       ND       1.0         cis-1,2-Dichloroethene       ND       1.0         trans-1,2-Dichloroethene       ND       1.0         Chloroform       ND       1.0         Freen 113       ND       1.0         1,2-Dichloroethane       ND       1.0         1,1-Trichloroethane       ND       1.0         Carbon tetrachloride       ND       1.0         Bromodichloromethane       ND       1.0         1,2-Dichloropropane       ND       1.0         cis-1,3-Dichloropropene       ND       1.0         Trichloroethylene       ND       1.0         1,1,2-Trichloroethane       ND       1.0         trans-1,3-Dichloropropene       ND       1.0         Dibromochloromethane       ND       1.0         2-Chloroethylvinyl ether       ND       1.0         Bromoform       ND       1.0         Tetrachloroethene       ND       1.0         1,1,2,2-Tetrachloroethane       ND       1.0         Chlorobenzene       ND       1.0         Chlorobenzene       ND       1.0         1,3-Dichlorobenzene       ND       1.0	Trichlorofluoromethane	ND	1.0
cis-1,2-Dichloroethene         ND         1.0           trans-1,2-Dichloroethene         ND         1.0           Chloroform         ND         1.0           Freon 113         ND         1.0           1,2-Dichloroethane         ND         1.0           1,1,1-Trichloroethane         ND         1.0           Carbon tetrachloride         ND         1.0           Bromodichloromethane         ND         1.0           1,2-Dichloropropane         ND         1.0           cis-1,3-Dichloropropene         ND         1.0           Trichloroethylene         ND         1.0           1,1,2-Trichloroethane         ND         1.0           trans-1,3-Dichloropropene         ND         1.0           Dibromochloromethane         ND         1.0           2-Chloroethylvinyl ether         ND         1.0           Bromoform         ND         1.0           Tetrachloroethene         ND         1.0           1,1,2,2-Tetrachloroethane         ND         1.0           Chlorobenzene         ND         1.0           1,3-Dichlorobenzene         ND         1.0	l, I-Dichloroethene	ND	1.0
trans-1,2-Dichloroethene       ND       1.0         Chloroform       ND       1.0         Freon 113       ND       1.0         1,2-Dichloroethane       ND       1.0         1,1-Trichloroethane       ND       1.0         Carbon tetrachloride       ND       1.0         Bromodichloromethane       ND       1.0         1,2-Dichloropropane       ND       1.0         cis-1,3-Dichloropropene       ND       1.0         Trichloroethylene       ND       1.0         1,1,2-Trichloroethane       ND       1.0         trans-1,3-Dichloropropene       ND       1.0         Dibromochloromethane       ND       1.0         2-Chloroethylvinyl ether       ND       1.0         Bromoform       ND       1.0         Tetrachloroethene       ND       1.0         1,1,2,2-Tetrachloroethane       ND       1.0         Chlorobenzene       ND       1.0         1,3-Dichlorobenzene       ND       1.0	1,1-Dichloroethane	ND	1.0
Chloroform         ND         1.0           Freon 113         ND         1.0           1,2-Dichloroethane         ND         1.0           1,1,1-Trichloroethane         ND         1.0           Carbon tetrachloride         ND         1.0           Bromodichloromethane         ND         1.0           1,2-Dichloropropane         ND         1.0           cis-1,3-Dichloropropene         ND         1.0           Trichloroethylene         ND         1.0           1,1,2-Trichloroethane         ND         1.0           trans-1,3-Dichloropropene         ND         1.0           Dibromochloromethane         ND         1.0           2-Chloroethylvinyl ether         ND         2.0           Bromoform         ND         1.0           Tetrachloroethene         ND         1.0           1,1,2,2-Tetrachloroethane         ND         1.0           Chlorobenzene         ND         1.0           1,3-Dichlorobenzene         ND         1.0	cis-1,2-Dichloroethene	ND	1.0
Freen 113         ND         1.0           1,2-Dichloroethane         ND         1.0           1,1,1-Trichloroethane         ND         1.0           Carbon tetrachloride         ND         1.0           Bromodichloromethane         ND         1.0           1,2-Dichloropropane         ND         1.0           cis-1,3-Dichloropropene         ND         1.0           Trichloroethylene         ND         1.0           trans-1,3-Dichloropropene         ND         1.0           Dibromochloromethane         ND         1.0           2-Chloroethylvinyl ether         ND         1.0           Bromoform         ND         1.0           Tetrachloroethene         ND         1.0           1,1,2,2-Tetrachloroethane         ND         1.0           Chlorobenzene         ND         1.0           1,3-Dichlorobenzene         ND         1.0	trans-1,2-Dichloroethene	ND	1.0
1, 2 - Dichloroethane       ND       1.0         1, 1, 1 - Trichloroethane       ND       1.0         Carbon tetrachloride       ND       1.0         Bromodichloromethane       ND       1.0         1, 2 - Dichloropropane       ND       1.0         cis - 1, 3 - Dichloropropene       ND       1.0         Trichloroethylene       ND       1.0         1, 1, 2 - Trichloroethane       ND       1.0         trans - 1, 3 - Dichloropropene       ND       1.0         Dibromochloromethane       ND       1.0         2 - Chloroethylvinyl ether       ND       1.0         Bromoform       ND       1.0         Tetrachloroethene       ND       1.0         1, 1, 2, 2 - Tetrachloroethane       ND       1.0         Chlorobenzene       ND       1.0         1, 3 - Dichlorobenzene       ND       1.0	Chloroform	ND	1.0
1,1,1-Trichloroethane       ND       1.0         Carbon tetrachloride       ND       1.0         Bromodichloromethane       ND       1.0         i,2-Dichloropropane       ND       1.0         cis-1,3-Dichloropropene       ND       1.0         Trichloroethylene       ND       1.0         i,1,2-Trichloroethane       ND       1.0         trans-1,3-Dichloropropene       ND       1.0         Dibromochloromethane       ND       1.0         2-Chloroethylvinyl ether       ND       2.0         Bromoform       ND       1.0         Tetrachloroethene       ND       1.0         1,1,2,2-Tetrachloroethane       ND       1.0         Chlorobenzene       ND       1.0         1,3-Dichlorobenzene       ND       1.0	Freon 113	ND	1.0
Carbon tetrachloride       ND       1.0         Bromodichloromethane       ND       1.0         1,2-Dichloropropane       ND       1.0         cis-1,3-Dichloropropene       ND       1.0         Trichloroethylene       ND       1.0         1,1,2-Trichloroethane       ND       1.0         trans-1,3-Dichloropropene       ND       1.0         Dibromochloromethane       ND       1.0         2-Chloroethylvinyl ether       ND       1.0         Bromoform       ND       1.0         Tetrachloroethene       ND       1.0         1,1,2,2-Tetrachloroethane       ND       1.0         Chlorobenzene       ND       1.0         1,3-Dichlorobenzene       ND       1.0	1,2-Dichloroethane	ND	1.0
Bromodichloromethane         ND         1.0           1,2-Dichloropropane         ND         1.0           cis-1,3-Dichloropropene         ND         1.0           Trichloroethylene         ND         1.0           1,1,2-Trichloroethane         ND         1.0           trans-1,3-Dichloropropene         ND         1.0           Dibromochloromethane         ND         1.0           2-Chloroethylvinyl ether         ND         1.0           Bromoform         ND         1.0           Tetrachloroethene         ND         1.0           1,1,2,2-Tetrachloroethane         ND         1.0           Chlorobenzene         ND         1.0           1,3-Dichlorobenzene         ND         1.0	l, l, l-Trichloroethane	ND	1.0
1, 2-Dichloropropane       ND       1.0         cis-1, 3-Dichloropropene       ND       1.0         Trichloroethylene       ND       1.0         1, 1, 2-Trichloroethane       ND       1.0         trans-1, 3-Dichloropropene       ND       1.0         Dibromochloromethane       ND       1.0         2-Chloroethylvinyl ether       ND       1.0         Bromoform       ND       1.0         Tetrachloroethene       ND       1.0         1, 1, 2, 2-Tetrachloroethane       ND       1.0         Chlorobenzene       ND       1.0         1, 3-Dichlorobenzene       ND       1.0	Carbon tetrachloride	ND	1.0
cis-1,3-Dichloropropene       ND       1.0         Trichloroethylene       ND       1.0         1,1,2-Trichloroethane       ND       1.0         trans-1,3-Dichloropropene       ND       1.0         Dibromochloromethane       ND       1.0         2-Chloroethylvinyl ether       ND       2.0         Bromoform       ND       1.0         Tetrachloroethene       ND       1.0         1,1,2,2-Tetrachloroethane       ND       1.0         Chlorobenzene       ND       1.0         1,3-Dichlorobenzene       ND       1.0	Bromodich lorome than e	ND	1.0
Trichloroethylene         ND         1.0           1,1,2-Trichloroethane         ND         1.0           trans-1,3-Dichloropropene         ND         1.0           Dibromochloromethane         ND         1.0           2-Chloroethylvinyl ether         ND         2.0           Bromoform         ND         1.0           Tetrachloroethene         ND         1.0           1,1,2,2-Tetrachloroethane         ND         1.0           Chlorobenzene         ND         1.0           1,3-Dichlorobenzene         ND         1.0	1,2-Dichloropropane	ND	1.0
1,1,2-Trichloroethane       ND       1.0         trans-1,3-Dichloropropene       ND       1.0         Dibromochloromethane       ND       1.0         2-Chloroethylvinyl ether       ND       2.0         Bromoform       ND       1.0         Tetrachloroethene       ND       1.0         1,1,2,2-Tetrachloroethane       ND       1.0         Chlorobenzene       ND       1.0         1,3-Dichlorobenzene       ND       1.0	cis-1,3-Dichloropropene	ND	1.0
trans-1,3-Dichloropropene       ND       1.0         Dibromochloromethane       ND       1.0         2-Chloroethylvinyl ether       ND       2.0         Bromoform       ND       1.0         Tetrachloroethene       ND       1.0         1,1,2,2-Tetrachloroethane       ND       1.0         Chlorobenzene       ND       1.0         1,3-Dichlorobenzene       ND       1.0	Trichloroethylene	ND	1.0
Dibromochloromethane         ND         1.0           2-Chloroethylvinyl ether         ND         2.0           Bromoform         ND         1.0           Tetrachloroethene         ND         1.0           1,1,2,2-Tetrachloroethane         ND         1.0           Chlorobenzene         ND         1.0           1,3-Dichlorobenzene         ND         1.0	I, I, 2-Trichloroethane	ND	1.0
2-Chioroethylvinyl etherND2.0BromoformND1.0TetrachloroetheneND1.01,1,2,2-TetrachloroethaneND1.0ChlorobenzeneND1.01,3-DichlorobenzeneND1.0	trans-1,3-Dichloropropene	ND	1.0
Bromoform         ND         1.0           Tetrachloroethene         ND         1.0           1,1,2,2-Tetrachloroethane         ND         1.0           Chlorobenzene         ND         1.0           1,3-Dichlorobenzene         ND         1.0	Dibromochloromethane	ND	1.0
TetrachloroetheneND1.01,1,2,2-TetrachloroethaneND1.0ChlorobenzeneND1.01,3-DichlorobenzeneND1.0	2-Chloroethylvinyl ether	ND	2.0
1,1,2,2-TetrachloroethaneND1.0ChlorobenzeneND1.01,3-DichlorobenzeneND1.0	Bromoform	ND	i.0
Chlorobenzene ND 1.0 1,3-Dichlorobenzene ND 1.0	Tetrachloroethene	ND	1.0
Chlorobenzene ND 1.0 1,3-Dichlorobenzene ND 1.0	1, 1, 2, 2-Tetrachloroethane	ND	1.0
	Chlorobenzene	ND	1.0
1,2-Dichlorobenzene ND 1.0	1,3-Dichlorobenzene	ND	1.0
	1,2-Dichlorobenzene	ND	1.0
i, 4-Dichlorobenzene ND 1.0		ND	

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

	=======
Surrogate Recovery, %	111
	=======

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### MS/MSD SUMMARY SHEET FOR EPA 8010\8020

Operator:

ΑV

Spike file: 351W/X015

Analysis date:

12/18/91

Spike dup file: 351W/X016

Sample type: Sample ID:

WATER 105943-2 Instrument: GC12 Sequence Name: dec 17

8010 MS/MSD DATA (spiked at 2	0 dadd 0				=====
SPIKE COMPOUNDS  1,1-Dichloroethene Trichloroethene Chlorobenzene	READING 23.49 23.26 21.17	RECOVERY 117 % 116 % 106 %	STATUS OK OK OK	LIMITS 60 - 88 - 90 -	133 125 127
SPIKE DUP COMPOUNDS  1,1-Dichloroethene Trichloroethene Chlorobenzene	22.36 22.78 21.74	112 % 114 % 109 %	OK OK OK	60 - 88 <del>-</del> 90 -	133 125 127
SURROGATES BRCMOBENZENE (MS) BRCMOBENZENE (MSD)	108.00 109.00	108 % 109 %	ok ok	98 <del>-</del> 98 -	115 115
8020 MS/MSD DATA (spiked at 2	20 ppb)				:=:=:=================================
SPIKE COMPOUNDS  Benzene  Toluene Chlorobenzene	READING 23.42 23.19 17.85	116 %	OK	LIMITS 62 - 61 - 84 -	120 121 115
COTTOR DITT COMPOUNDS					

		READING	RECOVERY	STATUS	TITMTTS
	SPIKE COMPOUNDS	KEAD ING	KECO VEKI	UITALUU	
		23.42	117 %	OK	62 <b>~</b>
	Benzene	<del>-</del>	116 %	OK	61 -
	Toluene	23.19	116 %	OΛ	0.1
	OUGENE		^	~ Y7	0.4

113 %	ok	61 - 12
97 %	ok	84 - 11
	97 %	97 % OK

0111101 02 -111				
SURROGATES BROMOBENZENE BROMOBENZENE	101.00	101 % 101 %	ok ok	91 - 107 91 - 107

RPD DATA

8010 COMPOUNDS 1,1-Dichloroethene Trichloroethene Chlorobenzene	SPIKE SPIKE DUP 23.49 22.36 23.26 22.78 21.17 21.74	RPD STATUS LI 5 % OK 2 % OK 3 % OK	IMITS <= 14 <= 14 <= 13
8020 COMPOUNDS Benzene Toluene Chlorobenzene	23.42 22:88 23.19 22.60 17.85 19.42	2 % OK 3 % OK 8 % OK	<= 11 <= 13 <= 13

## Subsurface Consultants

### CHAIN OF CUSTODY RECORD

				Ø AL	(MLILLICELL LEG	or KEQUESI	
Project Nam	me:	13+	+ Jeff	ersov	<u>GW</u>		
SCI Job Nu	mber:	<del>- , </del>	430.0	13			
Project Co	ntact at S	CI:	Sean	Carse	<u> </u>	,	
Sampled By	•		Fern	ando	Velez		
Analytical	Laborator	л:	Curt	s + To	molsing		
Analytical	Turnaroun	.d:	^	ormo	٠ ١		
Sample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	SamplingDate	Hold	Analysis	Analytical Method	
47	W	V×5_	6/13/91		TVH/BTX	8010	
<del>-48</del>	<del>- W</del> -	V×5	6/13/91		TVH/BTXE	8010	 >/ 503C
	<del></del>	Gl×Z		·	0+6 TEH	SMWW 500 8015/3550	
49	10)	V×5	6/13/91		TVH/BTXE	8010 8010	
51	w_ W_	V × 5	6/13/91		TVH /BTXE	8012/8020/	5030
_52	$\underline{w}$	V ×5	6/13/91		TUH/BIXE	8012/8050/20	230
53	W	V×5	6/13/91	·	TVH / BTXE	10508/2108	5030
54	<u> </u>	V ×5	6/13/91		TVH/BTXE	9015/8020/	5030
59	W	V.3	6/13/91		VOC'S	8010	
				····			
•	* //	* // *	*		* *	/ 1 ,	
Released by	y: House	Recei	ved by:		Date: <u> </u>	6/13/9/	
Released by	¥,	Recei	.ved by:		Date: _		
Received by	y Laborato	ry: /			Date:	6/13/91 M	1:50
Released by	y Laborato	ry:			Date: _		
Released by	y:				Date:		
1 Sample 12 Containe	Type: W = er Type: V	Water, S = = VOA, P =	Soil, 0 = 0 Plastic, G	ther (s	specify) s, T = Brass	Tube,	

<sup>0 =</sup> Other (specify)

NOTES TO LABORATORY:

<sup>-</sup> Notify SCI if there are any anomalous peaks on GC or other scans - Questions/clarifications - Contact SCI at (415) 268-0461

#### DALE/TIME DATE/TIME RECEIVED BY: (Signature) 1 DATE/TIME ANALYSIS REQUESTED Subsurface Consultants, Inc. Щ. Ю. 171 12TH STREET, SUITE 201, OAKLAND, CALIFORNIA 94607 RECEIVED BY: (Signature) RECEIVED BY: (Signature) 9 + () 17: 525aek CHAIN OF CUSTODY RECORD 5108 922C (510) 268-0461 · FAX: 510-268-0137 ANB 0108 PAGE. BXTN NOTES TIME 149X auus (Jokade 12/14) 4:40 RELEASED BY: (Signature) DATE/TIME RELEASED BY: (Signature) DATE/TIME RELEASED BY: (Signature) DATE/ IIME SAMPLING DATE 70,450 Cartis, Tompkins YEAR ð ₽ Spen MONTH NONE METHOD PRESERVED ICE EQNH REQUESTED BY: TURNAROUND: 10S2H HCF CONTAINERS LAB: **TUBE** TNIq HER 0000 AOV 13th + Jeffersol PROJECT CONTACT: Sean CANSOM SAMPLED BY: Macianne Watsola MATRIX ЫА **3TSAW** TIOS CHAIN OF CUSTODY FORM 430.0(3 MATER TO-MW MW-59 MW-48 MW- 49 M42-47 SCI SAMPLE NUMBER COMMENTS & NOTES: PROJECT NAME: JOB NUMBER: LABORATORY I.D. NUMBER

(510) 268-0461 · FAX: 510-268-0137

STATE OF CALIFORNIA

PETE WILSON, Governor

## CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN FRANCISCO BAY REGION

2101 WEBSTER STREET, SUITE 500 OAKLAND, CA 84612 Phone: (415) 464-1255 FAX: (415) 464-1380



### FACSIMILE COVER SHEET

To: me Paul Smith
Fax Number: 415-568-3706
From: Eddy So .
Subject: Bramaloa Pacific at 15/Jefferson 84.
Total pages including cover sheet:
If you are having any problems receiving this, please call sender.
Comments:
Re our teleconversation, pla find enclosed for yp
info N provide if 1) can those available for
my perusal Thanks. (Alay Ques call me!).

568-3706 LIA - ACHA

18th / Jefferson 8t. Drain dump Remediation Plan (12 DCA contaminated Ges) Inte Dame: Bramalea Pacific

Assues: (Roquest following into from RP.)

1. Jacknied info about the existing carron adaption system including

system design, carron tokumu performance curve, current contaminants boing tonated by the system.

2 Provide me with all nationales to constantiate the selection of the referred location of the extraction well, If any everlable

3. What contingency plan will be provided in case of that

(a) pumps and for other plumbing to fixtures break down?

(b) Carbon Cohemns reach to the saturation capacity?

(C) the untreated que storage toute reptine or fails due to other mechanical reasons I such as corrosion / cracks in weld lines)

4. How the treatment system monitoring program is modeficed to suit for the

introduction of DCA into the Sayoteur

5. On extinate of the duration for P/p-2-treat operation

& Clean up level for 12-DCA?

7. What is the current wage of the

treated water of the treatment plant:

7	 	= ::	CF	77	4 2 3	53	11	7 -	31
	 1 4	- ·	:	4.72	~ · · · · · · · · · · · · · · · · · · ·	4 3 3 3	1.5	3 4 .	/ h

TC:

Mr. John Esposito Bramalea Pacific

1111 Broadway, Suite 1400

Oakland, CA 94612

DATE:

July 8, 1991

PROJECT

13th & Jefferson Streets/Gasoline Fuel Tank/Floor Drain Sump

SOLJOS NUMBER:

430.013

	WEA	RE	SENDIN	ig you:
--	-----	----	--------	---------

X or our final report		TX if you have any questions, please call
execution and the second secon		for your review and comment
a draft of our report		please return an executed copy
a Service Agreement		for geotechnical services
a processed scope of services		with our comments
grading foundation plans		with Chain of Gustody documents
soil samples/groundwater sample:	S	X for your use
an executed contract		

#### REMARKS:

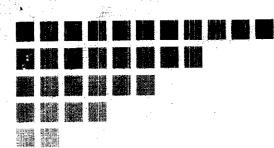
COPIES TO: (1) Ms. Lois Parr, City of Oakland Redevelopment Agency, 1333 Broadway #900, Oakland, CA

(1) Mr. Lester Feldman, RWQCB, 1800 Harriosn, #700, Oakland, CA 94612

(1) Mr. Donnell Choy, City Attorney, 505 14th Street, 12th Floor, Oakland, CA
(1) Mr. Roy Ikeda, Crosby, Heafey, Roach & May, 1999 Harrison St., Oakland, CA
√(2) Mr. Paul Smith, ACHCSA, 40 Swan Way, #200, Oakland, CA 94621

Sean O. Carson (dead)

### Subsurface Consultants, Inc.



July 9, 1991 SCI 430.014

Mr. Paul Smith Alameda County Health Care Services Agency 80 Swan Way, Room 200 Oakland, California 94621

Remediation Plan DCA Contaminated Groundwater 13th and Jefferson Streets Oakland, California

Dear Mr. Smith:

This letter presents our remediation plan for the cleanup of contaminated groundwater associated with floor drain sump repeases at 1330 Martin Luther King, Jr. Way in Oakland, California. The previous sump location is shown on Plate 1. Subsurface Consultants, Inc. (SCI) previously observed the removal of the concrete sump and associated contaminated soils. The results of these soil remediation activities are recorded in a report dated September 24, 1990. Groundwater quality studies have been conducted by SCI. The results are recorded in a report dated July 8, 1991.

Since sump removal, 1,2-dichloroethane (DCA) has been detected in Monitoring Wells 47 and 48, which are located adjacent to and downgradient of the previous sump. DCA concentrations have ranged from 6 to 60 ug/l. The highest concentrations have been detected in Well 48. A summary of the analytical results are presented in Table 1. Based on our analytical data, we judge that the approximate extent of the DCA plume is as shown on Plate 1.

### Subsurface Consultants, Inc.

Mr. Paul Smith Alameda County Health Care Services Agency SCI 430.014 July 9, 1991 Page 2

Table 1. Volatile Organic Chemical Concentrations in Groundwater

<u>Well</u>	Date	1,2 DCA <sup>1</sup> (ug/L) <sup>3</sup>	1,2 DCE <sup>2</sup> (ug/L)	Chloroform (ug/L)	Other EFA 8010 (ug/L)
MW-47	12/03/90	ND <sup>4</sup>	11	ND	ND
	01/04/91	16	ND	ND	ND
	03/13/91	6.7	ND	·ND	ND
MW-48	10/04/90	60	ND	ND	ND
	12/03/90	31	ND	ND	ND
	01/04/91	15	ND	ND	ND
	03/13/91	30	ND	ND	ND
MW-49	12/03/90	ND	ND	ND	ND
	03/03/91	NĎ	ND	ND	ND
MW-53	10/04/90	ND	ND	1.2	ND
	12/04/90	ND	ND	1.9	ND
	03/13/91	ND	ND	2.0	ND
MW-54	10/04/90	ND	ND	1.6	ND
	12/04/90	ND	ND	1.5	ND
	01/04/91	ND	ND	ND	ND
	03/13/91	ND	ND	ND	ND
MW-59	03/13/91	ND	ND	ND	ND
	04/03/91	ND	ND	ND	ND

<sup>1,2</sup> Dichloroethane

We propose to remediate the DCA contaminated groundwater by installing an extraction well at the location shown on Plate 1. The well will be installed in accordance with Regional Water Quality Control Board (RWQCB) guidelines. The well will consist of a 4-inch diameter PVC pipe installed in a 12-inch diameter borehole. Hollow auger drilling equipment will be used. The lower portion of the well will consist of machine slotted well screen with 0.02 inch wide slots. The pipe sections will be connected with flush threaded joints. The annulus around the screen will be

<sup>&</sup>lt;sup>2</sup> 1,2 Dichloroethene

Micrograms/liter = parts per billion

<sup>4</sup> None detected

Mr. Paul Smith Alameda County Health Care Services Agency SCI 430.014 July 9, 1991 Page 3

1 (1985) 1 (1985) 1 (1985)

filled with an appropriate filter sand. A bentonite seal will be placed above the filter pack and the upper portions of the borehole will be sealed with cement/bentonite grout. The wellhead will be secured below grade in a utility box. The company installing the well will be a licensed well drilling contractor. Details of the well are shown on Plate 2. We estimate that the well will terminate about 45 feet below street levels.

The well discharge pipeline will be installed within the existing basement garage. The discharge pipe will terminate at the water treatment facility located at the corner of 14th Street and Martin Luther King Jr. Way. The water treatment system is owned by the City of Oakland Redevelopment Agency and for the past year has been in operation at the site treating hydrocarbon contaminated groundwater. To date, the system has performed exceptionally well.

The extraction well will be developed by pumping until the water is relatively free of turbidity. Development water will be discharged into the treatment plant.

A pump test will be performed in the extraction well to evaluate the performance characteristics of the well and the hydraulic parameters of the aquifer. The pump test will consist of pumping groundwater from the extraction well at varying rates. Groundwater levels in existing monitoring wells in the area will be measured to determine the radius of influence of the extraction well. From the data generated, we will choose an appropriate pump, estimate the capture zone for the well and confirm that the well location is suitable. Groundwater extracted during the pump test will be discharged into the treatment plant.

The treatment system utilizes granular activated carbon to treat the contaminated groundwater. Effluent from the extraction well will discharged into a 21,000 gallon, closed top holding tank. From the holding tank, the water is pumped through a particulate filter system and then through two granular activated carbon filter columns plumbed in series. The treated groundwater is then discharged into another 21,000-gallon holding tank and then into the EBMUD sanitary sewer system. The treatment system is capable of processing up to 60 gallons per minute (gpm). The present influent flow rate into the system is approximately 3 gpm. The treatment system will be able to accommodate the increased flows that will be generated by the proposed extraction well.

SCI will obtain the necessary permits from EBMUD to discharge the treated DCA contaminated groundwater into the sanitary sewer system. The treatment system monitoring program will be modified to account for the introduction of DCA into the system.

Mr. Paul Smith Alameda County Health Care Services Agency SCI 430.014 July 9, 1991 Page 4

We are prepared to proceed with remediation as soon as your approval is received. If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.

James P. Bowers

Geotechnical Engineer 157 (expires 3/31/95)

Attachments: Plate 1 Site Plan

1 domminos 1

Plate 2 Typical Well Details

cc: Ms. Lois Parr, City of Oakland Redevelopment Agency

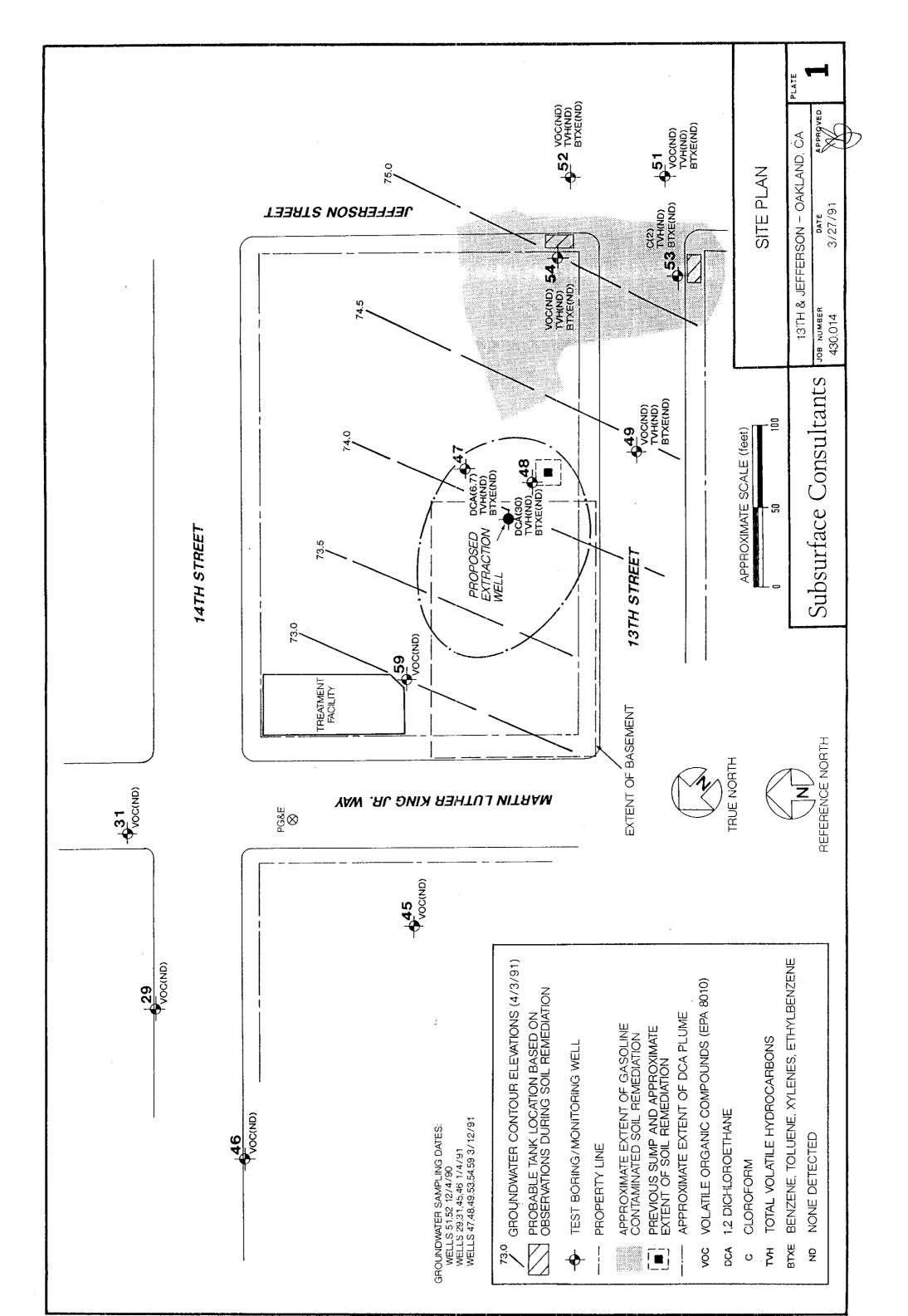
Mr. John Esposito, Bramalea Pacific

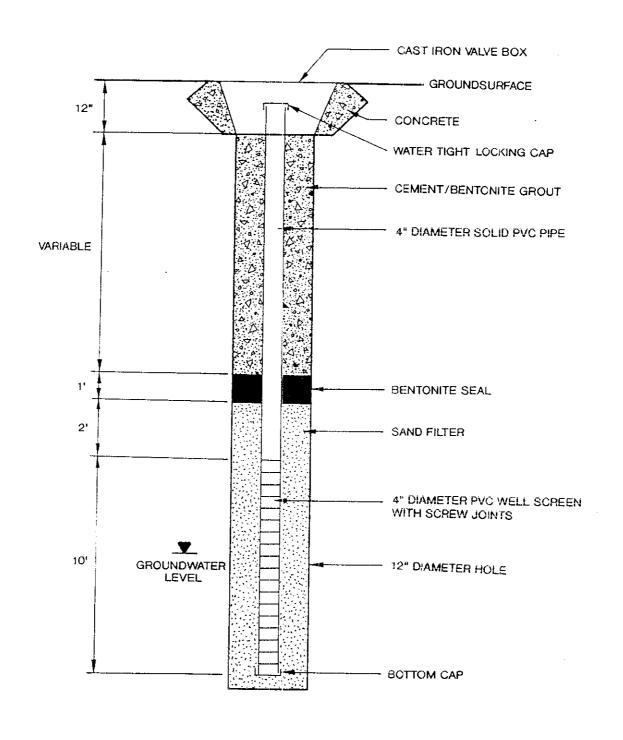
Mr. Donnell Choy, City of Oakland

Mr. Roy Ikeda, Crosby, Heafy, Roach, and May

Mr. Lester Feldman, RWQCB Mr. William Meckel, EBMUD

MK:JPB:sld





GROUNDWATER
EXTRACTION WELL DESIGN

Subsurface Consultants

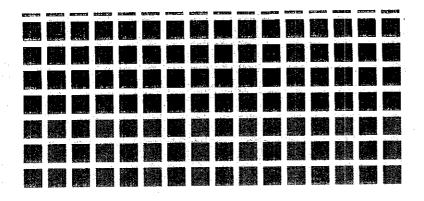
13TH & JEFFERSON - OAKLAND, CA

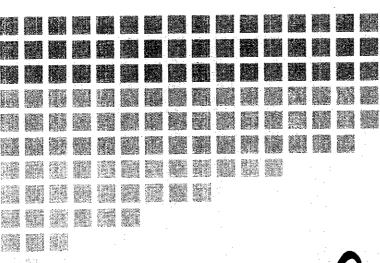
 JOB NUMBER
 DATE
 APPROVED

 430.014
 7/9/91
 JUL

2

PLATE





9-24-90

Subsurface Consultants, Inc.

CLOSURE REPORT FLOOR DRAIN SUMP 13TH AND JEFFERSON STREETS OAKLAND, CALIFORNIA SCI 430.006

STID 3623

#### Prepared for:

Mr. John Esposito Bramalea Pacific 1221 Broadway, Suite 1800 Oakland, California 94612

By:

Sean O. Carson

Civil Engineer 45074 (expires 3/31/94)

James P. Bowers

Geøtechnical Engineer 157 (expires 3/31/92)

Subsurface Consultants, Inc. 171 12th Street, Suite 201 Oakland, CA. 95607

September 24, 1990





#### I INTRODUCTION

This report records our services during the remediation of contamination resulting from a leaking floor drain sump. The location of the sump was approximately 33 feet north of 13th Street and 148 feet west of Jefferson Street in Oakland, California (Site Plan, Plate 1). Subsurface Consultants, Inc. (SCI) performed a preliminary environmental assessment of the site and presented the results in a report dated September 14, 1988. SCI was subsequently retained to oversee site remediation.

During the preliminary environmental assessment, a test boring was drilled adjacent to the sump. The boring was drilled to a depth of 34 feet. Contamination was not encountered in any of the samples obtained from the boring. However, upon removal of the concrete sump, contaminated soil was visible directly beneath it. The soil was stained gray/green and appeared to extend vertically with little or no lateral spreading.

#### II EXCAVATION AND REMEDIATION

HSR, Inc. performed the soil/sump remediation. Previous sampling of the sump contents indicated the presence of oil and grease, and very low concentrations of heavy metals, methylene chloride and PCB's. The sump, its contents and the soils within about 4 feet of the sump bottom were removed and disposed of at

the USPCI Grassy Mountain Facility in Knolls, Utah. The sump extended about 4 feet below the groundsurface. During initial excavation, the staining associated with the contaminated soils visually appeared to extend to a depth of approximately 14 feet below groundsurface. For this reason, the excavation was initially terminated at this depth. A soil sample was obtained at the bottom of the excavation. The sample was analyzed for a variety of substances. The analytical test results are summarized in Table 1.

The analytical data indicated that petroleum hydrocarbons had leaked from the sump and remained in the soil below the excavation bottom. The excavation was subsequently widened and deepened to depths of 21, 26 and 28 feet. Soil samples were obtained at each interval and analyzed for hydrocarbons and oil and grease. The excavation was advanced until all contaminated materials were removed. A summary of the analytical test data generated during excavation is presented in Table 2. The extent of the final excavation and typical locations of the final soil samples taken are shown on Plate 1. The excavation was backfilled with on-site native soils. The excavation measured about 15 by 15 feet in plan and extended to a maximum depth of 28 feet. Approximately 250 cubic yards of soil (in-place) were The excavation was extended about 1 foot below the groundwater level.

Table 1. CONTAMINANT CONCENTRATIONS IN SOIL3 BELOW SUMP

Contaminant <u>Metals</u>	Concentration (mg/kg <sup>1</sup> )
Barium	42
Cadmium	1.1
Chromium (total)	45
Cobalt	6.8
Copper	10
Lead	7.0
Nickel	25
Vanadium	21
Zinc	18
Other Title 22 Metals	$ND_{:2}$
Ethylbenzene	Trace
Total Xylenes	11
Other Volatile Organics (EPA 8240)	ND
Pesticides and PCBs (EPA 8080)	ND
Oil and Grease (SMWW 503E)	1,500
Total Extractable Hydrocarbons (TEH	1)
Gasoline Kerosene Diesel Total TEH	380 48,000 270 48,650
10tdl TEH	40,000

mg/kg = milligrams per kilogram
ND = None detected at concentrations above detection limits.

See test reports for detection limits. Sample Designation: Sump @ 14 feet

Table 2. HYDROCARBON CONCENTRATIONS (mg/kg)<sup>5</sup> IN SOIL

Sample Designation	TEH1	<u>0&amp;G</u> <sup>2</sup>	BTXE <sup>3</sup>
Sump @ 14 Sump @ 21	48,650 ND <sup>4</sup>	1,500 150	11 ND
Sump @ 26 Bottom North South West East	ND ND ND ND ND	89 ND ND 58 51	-
Sump @ 28 (Bottom) Well Samples	ND	ND	
N @ 12	ND		
N @ 18	ND		
N @ 24	ND		
s @ 6	ND		
S @ 12 S @ 18	ND		
S @ 18	ND		
S @ 24	$34^{6}$		
S2 @ 24	ND		
E @ 6	ND		
E @ 12	ND		
E @ 18	ND		
E @ 24	ND	ND	
w @ 6	ND		
W @ 12	ND		
w e 18	ND		
W @ 24	ND .	ND	

TEH = Total Extractable Hydrocarbons, EPA 8015/3550

O&G = Oil and Grease Method SMWW 503E

BTXE = Benzene, Toluene, Xylene and Ethylbenzene, EPA 8020 ND = None detected at concentrations above detection

limits. See test reports for detection limits.

<sup>5</sup> mg/kg = milligrams per kilogram

<sup>6</sup> Contaminated soil was removed and wall was resampled as S2 @ 24

#### III SAMPLING PROCEDURES

Samples were obtained from the excavation from soil brought to the surface by the excavator bucket. Sampling was performed using the following procedure: approximately 3 inches of soil was scraped away from the surface, and a clean brass sample liner was driven into the soil with a rubber mallet. The ends of the liner were covered with teflon sheeting, capped, sealed with duct tape and labeled. The samples were placed in an iced cooler and transported to the analytical laboratory. Chain-of-Custody documents accompanied the samples to the laboratory; copies are presented in the Appendix.

#### IV ANALYTICAL TESTING

Analytical testing was performed by Curtis & Tompkins, Ltd., a Department of Health Services (DHS) certified laboratory. Initially, a sample was analyzed for Title 26 metals, volatile organics (EPA 8240), organochlorine pesticides and PCB's (EPA 8080), oil and grease (SMWW 503E), and total extractable hydrocarbons (EPA 8015/3550). The analytical results revealed the presence of gasoline, kerosene, diesel, and oil and grease. Consequently, subsequent analytical testing was directed toward these materials.

#### V SOIL AERATION AND DISPOSAL

Contaminated soil removed from the excavation was aerated in accordance with requirements of the Bay Area Air Quality Management District (BAAQMD). The contaminated soil was excavated, stockpiled separately from non-contaminated soil, and covered with an impermeable membrane. Samples of the contaminated soil were obtained, composited and analytically tested to evaluate hydrocarbon concentrations. One composite sample was taken for the approximately 50 cubic yards of contaminated soil. During aeration, the contaminated soil was spread in a thin layer within the aeration area. The material was frequently turned and checked with an organic vapor meter. During aeration, samples of the aerated soil were obtained and analyzed for extractable hydrocarbons to monitor the rate and effectiveness of aeration. The test results are summarized in Table 3. Analytical test reports and Chain-of-Custody documents are included in the Appendix.

The aerated soils were disposed of at the West Contra Costa County Sanitary Landfill in Richmond. This is a Class 3 landfill facility and the soil was disposed of as a non-hazardous waste. Copies of non-hazardous waste manifests are included in the Appendix.

Table 3. CONTAMINANT CONCENTRATIONS IN AERATED SOIL (mg/kg)1

Sample Designation	Gasoline	Kerosene	Diesel	O&G <sup>2</sup>	BTXE3
Pre Aeration Sump A-1 thru 4	$\mathrm{ND}^4$	700	ND		
During Aeration					
Sump C-2 Sump C-3 Sump C-4	ND ND ND	470 470 460	ND ND ND	ND ND ND	ND ND ND
C-8 C-9 C-10	ND ND ND	170 110 130	ND ND ND		
C-11 C-12 C-13 C-14	ND ND ND ND	ND ND ND	Trace 39 54 32		
Post Aeration					
C-15 C-16 C-17	ND ND ND	ND ND ND	ND ND ND		

mg/kg = milligrams per kilogram

O&G = Oil and grease, Method SMWW 503E

BTXE = Benzene, Toluene, Xylene and Ethylbenzene, EPA 8020

ND= None detected at concentrations above detection limits.

See test reports for detection limits.

#### VI GROUNDWATER MONITORING

A groundwater monitoring well (MW-48) was installed adjacent to and downgradient of the sump excavation. The direction of groundwater flow was estimated using groundwater elevation dated from numerous nearby monitoring wells. The well (MW-48) consists of a 2-inch-diameter schedule 40 PVC pipe with flush-threaded The well was constructed through an 8-inch-diameter joints. hollow-stem auger. The well extends about 35 feet below grade. Groundwater was encountered at a depth of about 27 feet. lower 10 feet of the well consists of machine-slotted well screen having 0.020 inch slots. The annular space around the screened section was backfilled with Lone Star #3 sand. A bentonite plug, approximately 12 inches thick, was placed above the sand. annulus above the plug was filled with bentonite grout. The well was finished flush with the groundsurface. The wellhead is secured by a locking cover.

The monitoring well was subsequently developed, purged and sampled. The groundwater sample was analytically tested for suspected contaminants. The test results are summarized below in Table 4.

Table 4. ORGANIC CHEMICAL CONCENTRATIONS IN GROUNDWATER

<u>Well</u>	Sampling Date	$\underline{\mathtt{TEH}}^1$	O&G <sup>2</sup>	BTXE <sup>3</sup>	<u>TVH</u> 5
W-48	7/18/90	ND	ND	ND <sup>4</sup>	ND

#### VII CONCLUSIONS

Based upon our observations and analytical test results, we conclude that soil remediation was completed satisfactorily. Excavation removed soils containing hydrocarbons at concentrations above the analytical detection limits.

The groundwater from the monitoring well installed near the sump has been sampled and analytically tested. The analytical test results indicate that no detectable concentrations of petroleum hydrocarbons exist in the groundwater. Based on these results, we conclude that there has not been any significant impact on groundwater as a result of sump leakage.

TEH = Total Extractable Hydrocarbons, EPA 8015/3550

O&G = Oil and Grease, Method SMWW 503E

BTXE = Benzene, Toluene, Xylene, Ethylbenzene, EPA 8020

ND = None detected at concentrations above detection limits. See test reports for detection limits.

### List of Attached Plates

Plate 1

Site Plan

### Appendix:

Analytical Test Results

Chain-of-Custody Documents

Non-Hazardous Waste Manifests

### Distribution:

1 copy:

Mr. John Esposito

Bramalea Pacific

1221 Broadway, Suite 1800

Oakland, CA 94612

1 copy:

Ms. Lois Parr

City of Oakland, OEDE 1333 Broadway, Suite 900

Oakland, CA 94612

1 copy:

Ms. Katherine Chesick

Alameda County Health Care Services Agency

Division of Hazardous Materials

80 Swan Way, #200 Oakland, CA 94612

1 copy:

Mr. Lester Feldman

Regional Water Quality Control Board

1800 Harrison Street, Suite 700

Oakland, CA 94612

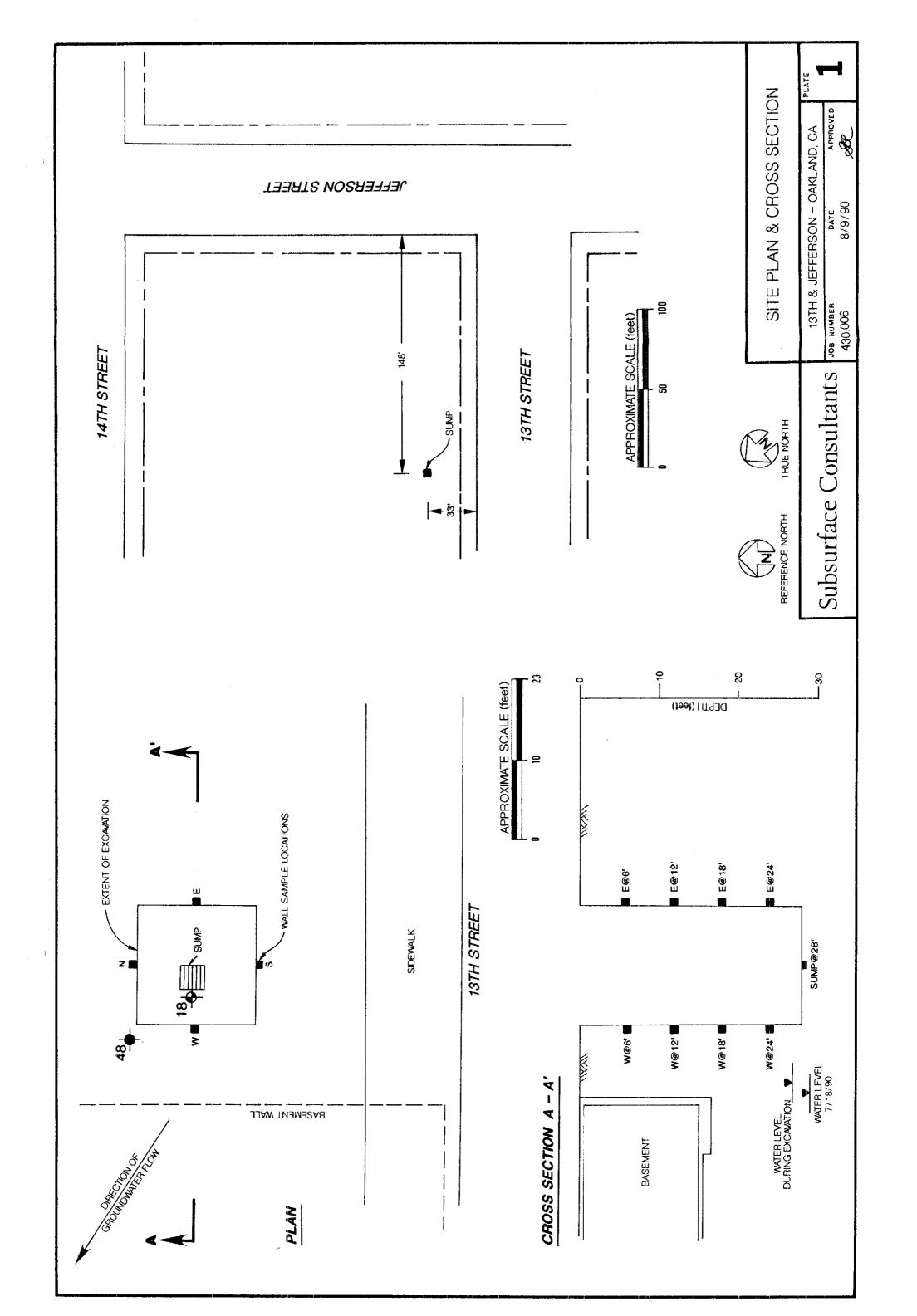
1 copy:

Mr. Roy Ikeda

Crosby, Heafy, Roach & May

1999 Harrison Street Oakland, CA 94612

SOC: JPB: RWR: mbl:clh





2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900 AUG 2 1 1989

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DATE RECEIVED: 08/14/89
DATE REPORTED: 08/16/89

PAGE 1 OF 6

LAB NUMBER: 18031

CLIENT: SUBSURFACE CONSULTANTS, INC.

REPORT ON: 1 SOIL SAMPLE

JOB #: 430.005

LOCATION: 13th & JEFFERSON

RESULTS: SEE ATTACHED

Laboratory Director

Los Angeles



CLIENT: SUBSURFACE CONSULTANTS, INC.

PROJECT #: 430.005 SAMPLE ID: SUMP @ 14' DATE RECEIVED: 08/14/89
DATE ANALYZED: 08/15/89
DATE REPORTED: 08/16/89

PAGE 2 OF 6

# Title 22 Metals in Soils & Wastes Digestion Method: EPA 3050

METAL	RESULT mg/Kg	DETECTION LIMIT mg/Kg	METHOD
	J J		
Antimony	ND	2.5	EPA 6010
Arsenic	ND	2.5	EPA 6010
Barium	42	0.5	EPA 6010
Beryllium	ND	0.5	EPA 6010
Cadmium	1.1	0.5	EPA 6010
Chromium (total)	45	0.5	EPA 6010
Cobalt	6.8	0.5	EPA 6010
Copper	10	0.5	EPA 6010
Lead	7.0	2.5	EPA 7420
Mercury	ND	0.1	EPA 7470
Molybdenum	ND	0.5	EPA 6010
Nickel	25	0.5	EPA 6010
Selenium	ND	2.5	EPA 6010
Silver	ND	1.0	EPA 6010
Thallium	ND	2.5	EPA 6010
Vanadium	21	1.0	EPA 6010
Zinc	18	0.5	EPA 6010

ND = None Detected

### QA/QC SUMMARY

	%RPD	%SPIKE		%RPD	%SPIKE	
Antimony	1	94	Mercury	1.4	62	
Arsenic	1	91	Molybdenum	<1	96	
Barium	4	105	Nickel	2	91	
Beryllium	3	99	Selenium	<1	96	
Cadmium	5	98	Silver	1	111	
Chromium	20	106	Thallium	1	99	
Cobalt	8	92	Vanadium	1	110	
Copper	6	91	Zinc	3	106	
Lead	16	102				



CLIENT: SUBSURFACE CONSULTANTS, INC.

JOB #: 430.005

SAMPLE ID: SUMP @ 14'

DATE RECEIVED: 08/14/89

DATE ANALYZED: 08/16/89 DATE REPORTED: 08/16/89

PAGE 3 OF 6

### EPA METHOD 8240: VOLATILE ORGANICS IN SOILS & WASTES

COMPOUND	Result ug/kg	Detection Limit ug/kg
chloromethane	ND	5,000
bromomethane	ND	5,000
vinyl chloride	ND	5,000
chloroethane	ND	5,000
methylene chloride	ND	2,500
trichlorofluoromethane	ND	2,500
1,1-dichloroethene	ND	2,500
1,1-dichloroethane	ND	2,500
trans-1,2-dichloroethene	ND	2,500
chloroform	ND	2,500
1,2-dichloroethane	ND	2,500
1,1,1-trichloroethane	ND	2,500
carbon tetrachloride	ND	2,500
bromodichloromethane	ND	2,500
1,2-dichloropropane	ND	2,500
cis-1,3-dichloropropene	ND	2,500
trichloroethylene	ND	2,500
dibromochloromethane	ND	2,500
1,1,2-trichloroethane	ND	2,500
benzene	ND	2,500
trans-1,3-dichloropropene	ND	2,500
2-chloroethylvinyl ether	ND	5,000
bromoform	ND	2,500
1,1,2,2-tetrachloroethane	ND	2,500
tetrachloroethylene	ND	2,500
toluene	ND	2,500
chlorobenzene	ND	2,500
ethyl benzene	TRACE	2,500
-		

### Non-Priority Hazardous Pollutant Substances List Compounds

acetone	ND	5,000
carbon disulfide	ND	2,500
2-butanone	ND	5,000
vinyl acetate	ИD	5,000
2-hexanone	ND	5,000
4-methyl-2-pentanone	ND	5,000
styrene	ND	2,500
total xylenes	11,000	2,500
QA/QC SUMMARY: SURROGATE RECOVERIES		
1,2-Dichloroethane-d4	74%	70-12
Toluene-d8	103%	81-11
Bromofluorobenzene	90%	74-12



CLIENT: SUBSURFACE CONSULTANTS, INC.

SAMPLE ID: SUMP @ 14' PROJECT #: 430.005 DATE RECEIVED: 08/14/89
DATE EXTRACTED: 08/15/89
DATE ANALYZED: 08/16/89
DATE REPORTED: 8/16/89

PAGE 4 OF 6

EPA 8080: Organochlorine Pesticides and PCBs in Soil & Wastes Extraction Method: EPA 3550 - Sonication

	Result	Detection
		Limit
COMPOUND	(mg/kg)	(mg/kg)
alpha-BHC	ND	0.05
beta-BHC	ND	0.05
gamma-BHC	ND	0.05
delta-BHA	ND	0.05
Heptachlor	ND	0.05
Aldrin	ND	0.05
Heptachlor Epoxide	ND	0.05
Endosulfan I	ND	0.05
pp-DDE	ND	0.05
Dieldrin	ND	0.05
Endrin	ND	0.05
Endosulfan II	NĎ	0.05
Endosulfan Sulfate	ND	0.05
4,4,-DDD	ND	0.05
Endrin Aldehyde	ND	0.05
pp-DDT	ND	0.05
Chlordane	ND	0.5
Toxaphene	ND	0.5
Methoxychlor	ND	0.5
PCB 1016	ND	0.5
PCB 1221	ND	0.5
PCB 1232	ND	0.5
PCB 1242	ND	0.5
PCB 1248	ND	0.5
PCB 1254	ND	0.5
PCB 1260	ND	0.5

ND = Not detected. Limit of detection appears right column.



LAB NUMBER: 18031

CLIENT: SUBSURFACE CONSULTANTS, INC.

PROJECT # : 430.005

DATE RECEIVED: 08/14/89 DATE ANALYZED: 08/16/89 DATE REPORTED: 08/16/89

PAGE 5 OF 6

ANALYSIS: OIL AND GREASE

METHOD: SMWW 503E

LAB ID	SAMPLE ID	RESULT	UNITS	DETECTION LIMIT
18031-1	SUMP @ 14'	1,500	mg/Kg	50

QA/QC SUMMARY

\_\_\_\_\_ 7 RPD, % 83 RECOVERY, % 



CLIENT: SUBSURFACE CONSULTANTS, INC.

PROJECT #: 430.005

LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 08/14/89

DATE ANALYZED: 08/16/89

DATE REPORTED: 08/16/89

PAGE 6 OF 6

Extractable Petroleum Hydrocarbons in Soils & Wastes
EPA 8015 (Modified)
Extraction Method: EPA 3550

LAB ID	CLIENT ID	GASOLINE (mg/Kg)	KEROSINE (mg/Kg)	DIESEL (mg/Kg)	
18031-1	SUMP @ 14'	380*	48,000**	270***	

- \* Fingerprint pattern does not match Hydrocarbon standards. Quantitation based on total area within C6-C9 boiling range.
- \*\* Fingerprint pattern does not match Hydrocarbon standards. Quantitation based on total area within C9-C12 boiling range.
- \*\*\* Fingerprint pattern does not match Hydrocarbon standards. Quantitation based on total area within C12-C22 boiling range.

ND = Not Detected; Limit of detection in parentheses.

### QA/QC SUMMARY

Duplicate: Relative % Difference

Spike: % Recovery

7 94



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MM 7|8|9|11|11|12|1|2|3|4|5|6

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DATE RECEIVED: 08/22/89 DATE REPORTED: 08/29/89

PAGE 1 OF 4

LAB NUMBER: 18092

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 1 SOIL SAMPLE

JOB #: 430.005

LOCATION: 13TH & JEFFERSON

RESULTS: SEE ATTACHED

Laboratory pirector

Wilmington Los Angeles

Berkeley



LAB NUMBER: 18092

CLIENT: SUBSURFACE CONSULTANTS

PROJECT # : 430.005

LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 08/22/89 DATE ANALYZED: 08/28/89

DATE REPORTED: 08/29/89

PAGE 2 OF 4

ANALYSIS: OIL AND GREASE

METHOD: SMWW 503E

LAB ID	SAMPLE ID	RESULT	UNITS	DETECTION LIMIT
18092-1	SUMP @ 21	150	mg/Kg	50

QA/QC SUMMARY 7 RPD, % RECOVERY, % 



CLIENT: SUBSURFACE CONSULTANTS

JOB #: 430.005

LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 08/22/89

DATE ANALYZED: 08/28/89 DATE REPORTED: 08/29/89

PAGE 3 OF 4

### Extractable Petroleum Hydrocarbons in Soils & Wastes EPA 8015 (Modified) Extraction Method: EPA 3550

LAB ID	CLIENT ID	GASOLINE (mg/Kg)	KEROSENE (mg/Kg)	DIESEL (mg/Kg)	OTHER (mg/Kg)
		<u> </u>			
18092-1	SUMP @ 21	ND(10)	ND(10)	ND(10)	ND(10)

ND = Not Detected; Limit of detection in parentheses.

### QA/QC SUMMARY

Duplicate: Relative % Difference

Spike: % Recovery

6

103



CLIENT: SUBSURFACE CONSULTANTS

PROJECT #: 430.005

LOCATION: 13TH & JEFFERSON

SAMPLE ID: SUMP @ 21

DATE RECEIVED: 08/22/89
DATE ANALYZED: 08/23/89
DATE REPORTED: 08/29/89

PAGE 4 OF 4

EPA 8020: Volatile Aromatic Hydrocarbons in Soils & Wastes Extraction Method: EPA 5030 - Purge & Trap

COMPOUND	Result ug/Kg	LOD ug/Kg
Benzene	ND	5
Toluene	ND	5
Ethyl Benzene	ND	5
Total Xylenes	ND	5
Chlorobenzene	ND	5
1,4-Dichlorobenzene	ND	5
1,3-Dichlorobenzene	ND	5
1,2-Dichlorobenzene	ND	5

ND = None Detected. Limit of detection (LOD) in last column.

### QA/QC:

Duplicate: Relative % Difference	5
Average Spike Recovery %	89



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DATE RECEIVED: 09/07/89 DATE REPORTED: 09/15/89

PAGE 1 OF 3

LAB NUMBER: 18209

CLIENT: SUBSURFACE CONSULTANTS, INC.

REPORT ON: 5 SOIL SAMPLES

JOB #: 430.005

LOCATION: 13th AND JEFFERSON

RESULTS: SEE ATTACHED

Wilmington

Los Angeles

Berkeley



CLIENT: SUBSURFACE CONSULTANTS

JOB #: 430.005

LOCATION: 13th AND JEFFERSON

DATE RECEIVED: 09/07/89

DATE ANALYZED: 09/12/89 DATE REPORTED: 09/15/89

PAGE 2 OF 3

# Extractable Petroleum Hydrocarbons in Soils & Wastes EPA 8015 (Modified) Extraction Method: EPA 3550

CLIENT ID	GASOLINE (mg/Kg)	KEROSENE (mg/Kg)	DIESEL (mg/Kg)	OTHER (mg/Kg)
SUMP @ 26'	ND(10)	ND(10)	ND(10)	ND(10)
,		37D ( 3.0 )	37T\ ( 1 ( ) \	ND (10)
=	ND(10)	NE(IU)	ND(IO)	ND(10)
	(10)	NTD (10)	37F5 ( 1 O )	ND / 1 (1 )
	ND(10)	ND(10)	ND(IO)	ND(10)
` '				
SUMP @ 26'	ND(10)	ND(10)	ND(10)	ND(10)
(WEST)				
SUMP @ 26' (EAST)	ND(10)	ND(10)	ND(10)	ND(10)
	SUMP @ 26' (BOTTOM) SUMP @ 26' (NORTH) SUMP @ 26' (SOUTH) SUMP @ 26' (WEST)	(mg/Kg)  SUMP @ 26' ND(10) (BOTTOM) SUMP @ 26' ND(10) (NORTH) SUMP @ 26' ND(10) (SOUTH) SUMP @ 26' ND(10) (WEST) SUMP @ 26' ND(10)	(mg/Kg) (mg/Kg)  SUMP @ 26' ND(10) ND(10) (BOTTOM) SUMP @ 26' ND(10) ND(10) (NORTH) SUMP @ 26' ND(10) ND(10) (SOUTH) SUMP @ 26' ND(10) ND(10) (WEST) SUMP @ 26' ND(10) ND(10)	(mg/Kg)     (mg/Kg)     (mg/Kg)       SUMP @ 26'     ND(10)     ND(10)     ND(10)       (BOTTOM)     ND(10)     ND(10)     ND(10)       SUMP @ 26'     ND(10)     ND(10)     ND(10)       (NORTH)     SUMP @ 26'     ND(10)     ND(10)     ND(10)       (SOUTH)     SUMP @ 26'     ND(10)     ND(10)     ND(10)       (WEST)     SUMP @ 26'     ND(10)     ND(10)     ND(10)

ND = Not Detected; Limit of detection in parentheses.

### QA/QC SUMMARY

Duplicate: Relative % Difference <1
Spike: % Recovery 97



LAB NUMBER: 18209

CLIENT: SUBSURFACE CONSULTANTS

PROJECT # : 430.005

LOCATION: 13th AND JEFFERSON

DATE RECEIVED: 09/07/89

DATE ANALYZED: 09/13/89

DATE REPORTED: 09/15/89

PAGE 3 OF 3

ANALYSIS: OIL AND GREASE

METHOD: SMWW 503E

LAB ID	SAMPLE ID	RESULT	UNITS	DETECTION LIMIT
18209-1	SUMP @ 26'	89	mg/Kg	50
18209-2	SUMP @ 26' (NORTH)	ND	mg/Kg	50
18209-3	SUMP @ 26'	ND	mg/Kg	50
18209-4	SUMP @ 26' (WEST)	58	mg/Kg	50
18209-5	SUMP @ 26' (EAST)	51	mg/Kg	50

ND = None Detected

QA/QC SUMMARY

RPD, % 5
RECOVERY, % 84



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

LAB NUMBER: 19868

CLIENT: SUBSURFACE CONSULTANTS

PROJECT # : 430.006

LOCATION: 13th & JEFFERSON

DATE RECEIVED: 02/08/90

DATE REQUESTED: 03/12/90

DATE ANALYZED: 03/13/90

DATE REPORTED: 03/14/90

ANALYSIS: OIL AND GREASE

METHOD: SMWW 503E

LAB ID	SAMPLE ID	RESULT	UNITS	DETECTION LIMIT
19868-1	SUMP @ 28	ND	mg/Kg	5 0
19868-2	E @ 24	ND	mg/Kg	5 0
19868-3	W @ 24	ND	mg/Kg	50

ND = NOT DETECTED

QA/QC	SUMMARY

OA/OC OFFICER

LABORATORY DIRECTOR

Berkeley

Wilmington

Los Angeles



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DATE RECEIVED: 02/08/90 DATE REPORTED: 02/12/90

PAGE 1 OF 2



LAB NUMBER: 19538

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 16 SOIL SAMPLES

PROJECT #: 430.006

LOCATION: 13TH & JEFFERSON

RESULTS: SEE ATTACHED

Los Angeles

Berkeley

Wilmington



CLIENT: SUBSURFACE CONSULTANTS

JOB #: 430.006

LOCATION: 13th & JEFFERSON

DATE RECEIVED: 02/08/90

DATE ANALYZED: 02/11/90 DATE REPORTED: 02/12/90

PAGE 2 OF 2

# Extractable Petroleum Hydrocarbons in Soils & Wastes California DOHS Method LUFT Manual October 1989

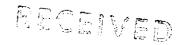
LAB ID	CLIENT ID	KEROSENE (mg/Kg)	DIESEL (mg/Kg)	OTHER (mg/Kg)
19538-1	SUMP@28	ND(10)	ND(10)	ND(10)
19538-2	N@1 2	ND(10)	ND(10)	ND(10)
19538-3	N@1 8	ND(10)	ND(10)	ND(10)
19538-4	N@2 4	ND(10)	ND(10)	ND(10)
19538-5	S@6	ND(10)	ND(10)	ND(10)
19538-6	S@1 2	ND(10)	ND(10)	ND(10)
19538-7	S@1 8	ND(10)	ND(10)	ND(10)
19538-8	S@2 4	34*	ND(10)	ND(10)
19538-9	E@6	ND(10)	ND(10)	ND(10)
19538-10	E@1 2	ND(10)	ND(10)	ND(10)
19538-11	E@18	ND(10)	ND(10)	ND(10)
19538-12	E@2 4	ND(10)	ND(10)	ND(10)
19538-13	W@6	ND(10)	ND(10)	ND(10)
19538-14	W@1 2	ND(10)	ND(10)	ND(10)
19538-15	W@18	ND(10)	ND(10)	ND(10)
19538-16	W@2 4	ND(10)	ND(10)	ND(10)

<sup>\*</sup>Fingerprint pattern does not match hydrocarbon standards. Quantitation based on area sum within C10-C16 boiling range.

ND = NOT DETECTED; LIMIT OF DETECTION IN PARENTHESES

### QA/QC SUMMARY

Duplicate: Relative % Difference <1
Spike: % Recovery 97





2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-Q900

LABORATORY NUMBER: 19586

CLIENT: SUBSURFACE CONSULTANTS

JOB #: 430.006

LOCATION: SUMP REMEDIATION

DATE RECEIVED: 02/14/90

DATE ANALYZED: 02/16/90

DATE REPORTED: 02/20/90

Extractable Petroleum Hydrocarbons in Soils & Wastes
California DOHS Method
LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE (mg/Kg)	DIESEL (mg/Kg)	OTHER (mg/Kg)
19586-1	S2 @ 24'	ND(10)	ND(10)	ND(10)

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY

Duplicate: Relative % Difference

Spike: % Recovery

99

OA/OC OFFICER

LABORATORY DIRECTOR

Berkeley

Wilmington

Los Angeles



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

DATE RECEIVED: 08/23/89
DATE REPORTED: 08/24/89

PAGE 1 OF 2

LAB NUMBER: 18095

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 1 SOIL COMPOSITE

JOB #: 430.005

LOCATION: 13TH & JEFFERSON

RESULTS: SEE ATTACHED

Laboratory Director

Berkeley Wilmington

Los Angeles



CLIENT: SUBSURFACE CONSULTANTS

JOB #: 430.005

LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 08/23/89

DATE ANALYZED: 08/23/89 DATE REPORTED: 08/24/89

PAGE 2 OF 2

# Extractable Petroleum Hydrocarbons in Soils & Wastes EPA 8015 (Modified) Extraction Method: EPA 3550

LAB ID	CLIENT ID	GASOLINE (mg/Kg)	KEROSENE (mg/Kg)	DIESEL (mg/Kg)	OTHER (mg/Kg)
18095- 1,2,3,4	SUMP A-1/ SUMP A-2/ SUMP A-3/ SUMP A-4	ND(10)	700	ND(10)	ND(10)

ND = Not Detected; Limit of detection in parentheses.

### QA/QC SUMMARY

Duplicate: Relative % Difference 11
Spike: % Recovery 103



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DATE RECEIVED: 09/13/89 DATE REPORTED: 09/18/89

PAGE 1 OF 4

LAB NUMBER: 18250

RECEIVED

CLIENT: SUBSURFACE CONSULTANTS

SEP 201989 M 7,8,8,8,8,1,12,12,13,14,5,6

REPORT ON: 3 SOIL SAMPLES

JOB #: 430.006

LOCATION: 13TH & JEFFERSON

RESULTS: SEE ATTACHED

QAVQC Officer

Laboratory Director

Berkeley Wilmington

Los Angeles



CLIENT: SUBSURFACE CONSULTANTS

JOB #: 430.006

LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 09/13/89

DATE ANALYZED: 09/13/89 DATE REPORTED: 09/18/89

PAGE 3 OF 4

Extractable Petroleum Hydrocarbons in Soils & Wastes
EPA 8015 (Modified)
Extraction Method: EPA 3550

LAB ID	CLIENT ID	GASOLINE (mg/Kg)	KEROSENE (mg/Kg)	DIESEL (mg/Kg)	OTHER (mg/Kg)
18250-1	SUMP C-4	ND(10)	470*	ND(10)	ND(10)
18250-2	SUMP C-2	ND(10)	470*	ND(10)	ND(10)
18250-3	SUMP C-3	ND(10)	460*	ND(10)	ND(10)

<sup>\*</sup>Fingerprint pattern does not match Hydrocarbon standards. Quantitation based on largest peaks within C9-C12 boiling range.

ND = Not Detected; Limit of detection in parentheses.

#### QA/QC SUMMARY

Duplicate: Relative % Difference 7
Spike: % Recovery 96



LAB NUMBER: 18250

CLIENT: SUBSURFACE CONSULTANTS

PROJECT # : 430.006/13TH & JEFFERSON

DATE RECEIVED: 09/13/89
DATE ANALYZED: 09/15/89
DATE REPORTED: 09/18/89

PAGE 2 OF 4

ANALYSIS: OIL AND GREASE

METHOD: SMWW 503E

LAB ID	SAMPLE ID	RESULT	UNITS	DETECTION LIMIT
18250-1	SUMP C-2	ND	mg/Kg	50
18250-2	SUMP C-3	ND	mg/Kg	50
18250-3	SUMP C-4	ND	mg/Kg	50

ND = NONE DETECTED

OA/OC SUMMARY

Sil Sc Politifici			
RPD, %	1		
RECOVERY, %	88		



CLIENT: SUBSURFACE CONSULTANTS

JOB NUMBER: 430.006

JOB LOCATION: 13TH & JEFFERSON

DATE RECEIVED: 09/13/89

DATE ANALYZED: 09/13/89 DATE REPORTED: 09/18/89

PAGE 4 OF 4

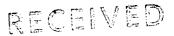
Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020 Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE (ug/kg)	TOLUENE (ug/kg)	TOTAL XYLENES (ug/kg)	ETHYL BENZENE (ug/kg)
				** 12 61 47 12 12 65 47 7	
18250-1	SUMP C-4	ND(5)	ND(5)	ND(5)	ND(5)
18250-2	SUMP C-2	ND(5)	ND(5)	ND(5)	ND(5)
18250-3	SUMP C-3	ND(5)	ND(5)	ND(5)	ND(5)

ND = NONE DETECTED; LIMIT OF DETECTION IN PARENTHESES.

### QA/QC SUMMARY

=	
%RPD	18
%RECOVERY	93



2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-6900

LABORATORY NUMBER: 18367

CLIENT: SUBSURFACE CONSULTANTS

JOB #: 430.006

LOCATION: JEFFERSON ST. SUMP REMEDIATION

DATE RECEIVED: 09/27/89 DATE ANALYZED: 09/27/89

DATE REPORTED: 09/29/89

Extractable Petroleum Hydrocarbons in Soils & Wastes EPA 8015 (Modified) Extraction Method: EPA 3550

LAB ID	CLIENT ID	GASOLINE (mg/Kg)	KEROSENE (mg/Kg)	DIESEL (mg/Kg)	OTHER (mg/Kg)
18267-1	C - 8	ND(10)	170*	ND(10)	ND(10)
18267-2	C - 9	ND(10)	110*	ND(10)	ND(10)
18267-3	C - 10	ND(10)	130*	ND(10)	ND(10)

ND = Not Detected; Limit of detection in parentheses.

\* = Fingerprint pattern does not match Hydrocarbon Standards. Quantitation based on area sum within C9 to C12 boiling range.

QA/QC SUMMARY

Duplicate: Relative % Difference

Spike: % Recovery

2 98

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Los Angeles

Berkeley

DATE RECEIVED: 10/11/89 DATE REPORTED: 10/12/59

PAGE 1 OF 2

LAB NUMBER: 18481

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 4 SOIL SAMPLES

JOB #: 430.006 LOCATION: JEFFERSON ST.

RESULTS: SEE ATTACHED

DA/OC Officer

Laboratory Director

Los Angeles

Berkeley

Wilmington



CLIENT: SUBSURFACE CONSULTANTS

JOB #: 430.006

LOCATION: JEFFERSON ST. SUMP REMEDIATION

DATE RECEIVED: 10/11/89

DATE ANALYZED: 10/11/89 DATE REPORTED: 10/12/89

PAGE 2 OF 2

# Extractable Petroleum Hydrocarbons in Soils & Wastes EPA 8015 (Modified) Extraction Method: EPA 3550

LAB ID	CLIENT ID	GASOLINE (mg/Kg)	KEROSENE DIESEL (mg/Kg)		OTHER (mg/Kg)
					· <del></del>
18481-1	C - 11	ND(10)	ND(10)	TRACE(5.8)*	ND(10)
18481-2	C - 12	ND(10)	ND(10)	39*	ND(10)
184813	C - 13	ND(10)	ND(10)	54*	ND(10)
18481-4	C - 14	ND(10)	ND(10)	32*	ND(10)

<sup>\*</sup> Fingerprint pattern does not match hydrocarbon standard. Quantitation based on area sum within C12-C22 boiling range.

ND = Not Detected; Limit of detection in parentheses.

### QA/QC SUMMARY

Duplicate: Relative % Difference	16				
Spike: % Recovery	97				



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

DATE RECEIVED: 02/23/90 DATE REPORTED: 03/06/90

PAGE 1 OF 2

LAB NUMBER: 19676

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 3 SOIL SAMPLES

PROJECT #: 430.006

LOCATION: SUMP REMEDIATION

RESULTS: SEE ATTACHED

Berkeley

OA/OC Officer

Laboratory Director

Wilmington

Los Angeles



CLIENT: SUBSURFACE CONSULTANTS

JOB #: 430.006

LOCATION: SUMP REMEDIATION

DATE RECEIVED: 02/23/90

DATE ANALYZED: 03/04/90

DATE REPORTED: 03/06/90

PAGE 2 OF 2

### Extractable Petroleum Hydrocarbons in Soils & Wastes California DOHS Method LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE (mg/Kg)	DIESEL (mg/Kg)	OTHER (mg/Kg)
19676-1	C-15	ND(10)	ND(10)	ND(10)
19676-2	C-16	ND(10)	ND(10)	ND(10)
19676-3	C-17	ND(10)	ND(10)	ND(10)

ND = Not Detected; Limit of detection in parentheses.

QA/QC SUMMARY 

Duplicate: Relative % Difference

Spike: % Recovery

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2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-999027 1990

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DATE RECEIVED: 07/19/90 DATE REPORTED: 07/23/90

PAGE 1 OF 4

LAB NUMBER: 101112

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 1 WATER SAMPLE

PROJECT #: 430.006

LOCATION: 13TH & JEFFERSON SUMP

RESULTS: SEE ATTACHED

QA/QC Approva

Firal Appro

Los Angeles

Berkeley

Wilmington



LAB NUMBER: 101112

CLIENT: SUBSURFACE CONSULTANTS

PROJECT #: 430.006

LOCATION: 13TH & JEFFERSON SUMP

DATE RECEIVED: 07/19/90

DATE ANALYZED: 07/23/90

DATE REPORTED: 07/23/90

PAGE 2 OF 4

ANALYSIS: HYDROCARBON OIL AND GREASE

METHOD: SMWW 17:5520F (503E)

LAB ID	SAMPLE ID		RESULT	UNITS	REPORTING LIMIT	
101112-1	48		ND	mg / L	2 0	

ND = Not detected at or above reporting limit

QA/QC SUMMARY



CLIENT: SUBSURFACE CONSULTANTS

JOB #: 430.006

LOCATION: 13TH & JEFFERSON SUMP

DATE RECEIVED: 07/19/90

DATE EXTRACTED: 07/19/90 DATE ANALYZED: 07/20/90

DATE REPORTED: 07/23/90

PAGE 3 OF 4

Extractable Petroleum Hydrocarbons in Water California DOHS Method LUFT Manual October 1989

LAB ID	CLIENT ID	KEROSENE RANGE (mg/L)	DIESEL RANGE (mg/L)	REPORTING LIMIT (mg/L)
		(mg/ = /		
101112-1	48	ND	ND	0.5

ND = Not Detected at or above reporting limit.

RPD, % 108 



CLIENT: SUBSURFACE CONSULTANTS

JOB NUMBER: 430.006

JOB LOCATION: 13TH & JEFFERSON SUMP

DATE RECEIVED: 07/19/90

DATE ANALYZED: 07/19/90 DATE REPORTED: 07/23/90

PAGE 4 OF 4

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

LAB ID	CLIENT ID	TVH AS GASOLINE (ug/L)		TOLUENE (ug/L)	22112	TOTAL XYLENES (ug/L)
101112-1	4 8	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

Project Name	e: <u>13</u>	+ Jef	Lerson			
SCI Job Numi	ber:	430.00	5			
Project Con	tact at S	ci: <u>Se</u>	in Cars	<u>0</u> 5		
Sampled By:			in Cars			
Analytical	Laborator	~ \ _	<b>&gt;</b>		<u> </u>	<del></del>
Analytical	Turnaroun	a: <u>RAPID</u>	24 Ho	rk		<u> </u>
Samula TÀ	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling Date	Hold	Analysi <u>s</u>	Analytical Method
Sample ID  SUMP & 14'84		<u> </u>	8/14/89	<del></del>	EPA #240	
yo <u>nir s j f s</u>			<u> </u>		EPA 8080	
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		<del></del>			TITLE 22 MET	ars
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Released by					Date	• <u></u> _
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Received by	: Mich	al Mais			Dat:e	: 8-14-89
I Comple My	ype: W =	water 5 =	soil, 0 = 0 plastic, 0	other (s = glas	pecify) s, T = bras	s tube,

Notes to Laboratory:
-Notify SCI if there are any anomalous peaks on GC or other scans
-Questions/clarifications...contact SCI at (415) 268-0461

Project Name	e: <u>13<sup>t</sup></u>	h + Jed	fferson			
SCI Job Num	ber:	430,0	<u> </u>			
Project Con	tact at SC	:: <u>S</u>	ean Co	r1202		
					<u> </u>	
Analytical	Laboratory	ر:رس	vtis +T	ompl	<u>cins</u>	
Analytical	Turnaround	l:	5 da	<del>`</del> }		
Sumpez	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling Date  \$\frac{1}{8}9	Hold	Analysis TEH-K	Analytical Method 8015/3550
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Released by	-		. 0		Date:	
Received by	Laborato	cy: Bolinds	a Reters		Date:	8/22/89
Relinquishe	d by Labo:	ratory:		· · · · · · · · · · · · · · · · · · ·	Date:	
Received by	•				Date:	
<pre>1 Sample Ty 2 Container</pre>	Type: V	water, S = = VOA, P = = other (s	soil, 0 = o plastic, G pecify)	ther (sp = glass	pecify) s, T = brass	tube,

Notes to Laboratory:
-Notify SCI if there are any anomalous peaks on GC or other scans -Questions/clarifications...contact SCI at (415) 268-0461

# Subsurtace Consultants

& ANALYTICAL TEST REQUEST

Project Name:	3th a JEFF	ELGON			
SCI Job Number:	430.00\$6		· · · · · · · · · · · · · · · · · · ·		
Project Contact at	sci: <u>J</u> .	BOWELS			
Sampled By:				The state of the s	
Analytical Laborato	ory: CMTI	5 & TomPU	45		·
Analytical Turnaro	und:#	ORMAL			
Sample ID Type1	Container <u>Type<sup>2</sup></u>	Sampling Date	Hold	Analysis	Analytical Method
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Sumperb'(HORTH) 5		9/6/89		TEH = 0+G	
Sumpe 26' (SOUTH) 5	<i>T</i>	9/6/89		TEH, O+G	
Sump @ 26' (4257) 5		9/6/89		TEH , 0+4	
xmp e 26'(EAST 5		9/6/89		TEH, 0+G	
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1 Sample Type: W 2 Container Type:	= water, S = V = VOA, P = O = other (s	plastic, G	ther (sp = glass	pecify) s, T = brass	tube,

Notes to Laboratory:
-Notify SCI if there are any anomalous peaks on GC or other scans -Questions/clarifications...contact SCI at (415) 268-0461

# Subsurtace Consultants

المنتقدية المتحدث والمتحدث & ANALYTICAL TEST REQUEST

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Notes to Laboratory:
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## Subsurface Consultants

#### & ANALYTICAL TEST REQUEST

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SCI Job Num	ber:	43	0.006			·
Project Con	tact at S	ci: <u>Se</u> s	in Corgo	· M		····
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		y: <u>Cu</u>				
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SUMP C-3			<u> </u>		O+G	8015/3550 SMWW 503 8020/5030
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Notes to Laboratory:

<sup>-</sup>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 CUSTOUY RECORD & ANALYTICAL TEST REQUEST

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SCI Job Nu	mber:	430	.006			
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ample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling 	Hold	Analysis	Analytical Method
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1 Sample T 2 Containe	ype: W =	water, S = VOA, P =	soil, 0 = o plastic, G	ther (sp	pecify) s, T = brass	s tube,

Notes to Laboratory:

<sup>0 =</sup> other (specify)

<sup>-</sup>Notify SCI if there are any anomalous peaks on GC or other scans -Questions/clarifications...contact SCI at (415) 268-0461

Project Nam	e:	Sam	p Remedi	ation		
SCI Job Num	ber:	430	.006			
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		<u> </u>				
		у:				
Analytical	Turnaroun	d:		5 day	<u> </u>	<del></del>
Sample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling Date	<u>Hold</u>	Analysis	Analytical Method
C -15	5	T	2-23-40		TEH	
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Sample Ty Container	r Type: \	water, S = / = VOA, P = ) = other (s	plastic, G	ther (s = glas	pecify) s, T = bras	s tube,

Notes to Laboratory:
-Notify SCI if there are any anomalous peaks on GC or other scans-Questions/clarifications...contact SCI at (415) 268-0461

Project Nam	ne:	3+h + J	efferson			
SCI Job Num	mber:	430.				
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Sampled By:			Jim C	<u>oule</u>	<del>/</del>	
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Notes to Laboratory:
-Notify SCI if there are any anomalous peaks on GC or other scans-Questions/clarifications...contact SCI at (415) 268-0461

Project Nam	ne:	13th	+ Jeffer	30g		
	•	Ļ	30,006	·		
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Sampled By:			Jim C	10w1-	<u>ey</u>	
Analytical	Laborator	у:	Curhs	+ TC	mpkins	
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	5_		2/8/90		TEH	EPA 8015/3550
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Relinguish	ed by Labo	oratory:			Date	•
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<sup>1</sup> Sample T <sup>2</sup> Containe	r Type: '	water, S = V = VOA, P = O = other (s	plastic, G	ther (s	pecify) s, T = bras	s tube,

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 Nam	e:	Sun	ip Remedi	ation		
SCI Job Num	ber:	·				
Analytical	Laborator	у:				
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Sample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling Date	Hold	Analysis	Analytical. Method
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Notes to Laboratory:

<sup>-</sup>Notify SCI if there are any anomalous peaks on GC or other scans -Questions/clarifications...contact SCI at (415) 268-0461

### VERBAL ADDITIONS / CANCELLATIONS TO ANALYSIS REQUEST SHEET

CLIENT: Subsu	face	Consaltants	DATE:	3-12-90	
REQUESTED BY:					
RECORDED BY:	nap				

	Current Lab ID		Circle	Specify add	)	
e e	(Previous Lab ID)	Client ID	matrix		Analysis	Due date
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<sup>+</sup> tes to Laboratory:
 -Notify SCI if there are any anomalous peaks on GC or other scans
-Questions/clarifications...contact SCI at (415) 268-0461

Project Name: 3	+ Jefferson		
SCI Job Number:			***************************************
Project Contact at SCI:	Seen Carson		
Sampled By:	Jim Crow	24	
Analytical Laboratory:	Curts + T	onokins	
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<sup>-</sup>Notify SCI if there are any anomalous peaks on GC or other scans -Questions/clarifications...contact SCI at (415) 268-0461

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Notes to Laboratory:

<sup>-</sup>Notify SCI if there are any anomalous peaks on GC or other scans -Questions/clarifications...contact SCI at (415) 268-0461

#### WASTE MANIFEST

Generators Name and Address	58:	
City of Oakland		
Office of Economic De	velopment and Employment	
1417 Clay Street, Oak	land, California 94612 Att	ention: Lois Parr
Phone No.: (415) 273-3692		
Transporter Company Name:	Stameo	
Designated Disposal Facili	ty Name and Address:	
West Contra Costa San	itary Landfill	
P.O. Box 5006	·	
	94805 (415) 236–800	
Description of Waste: Soil	containing less than 100 pa	arts per million of
kerosene		
Estimated Quantity of Wast	e: 22 ounds	
	tinor alouge	
Special Handling Instruction	ons:	
Generator/Representative:		
Generator/Representative.		
Dennis Alexander (of or day	Denni alstand	11-8-89
(Name)	(Signature)	(Date)
Transporter's Acknowledged	Receipt of Material:	
Thom fox	Min. tox	11-8-89
(Name)	(Signature)	(Date)
Disposal Facility Acknowle	dged Receipt of Materia	1:
1 Mod. 4	Justa Myh (Signature)	3 1118/85
(Name)	(Signature)	(Date)

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#### WASTE MANIFEST

Generators' Name and Addres	s:	
City of Oakland		
Office of Economic Dev	elopment and Employment	
1417 Clay Street, Oakl	and, California 94612 At	tention: Lois Parr
Phone No.: (415) 273-3692		
Transporter Company Name: _	Stameo	
Designated Disposal Facilit	y Name and Address:	
West Contra Costa Sani	tary Landfill	
P.O. Box 5006		
Richmond, California	94805 (415) 236-80	000
Description of Waste: Soil		
	Concarning 1033 Clair 100 p	at to pol marketon
kerosene	30	
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Special Handling Instruction	TANDE CLOUDE	
		DEC 15 1989
		7,8,9,10,11,12,1,12,13,4,5,6
Generator/Representative:		<b>§</b>
. (	١	
Dennis Alexander (of Dakland,	Dennis alexan	11-6-89
(Name)	(Signature)	(Date)
Transporter's Acknowledged	Receipt of Material:	
Thom Fox	JRan to	11-8-89
(Name)	(Signature)	(Date)
Disposal Facility Acknowled	ged Receipt of Materia	al:
(Name)	(Signature)	(Date)

#### WASTE MANIFEST

Generators name and Address		
City of Oakland		
Office of Economic Dev	elopment and Employment	
1417 Clay Street, Oakl	and, California 94612 Attention	: Lois Parr
Phone No.: (415) 273-3692		
	Stanco	
<del>-</del>		
Designated Disposal Facilit	y Name and Address:	
West Contra Costa Sani	tary Landfill	
P.O. Box 5006		
Richmond, California	94805 (415) 236-8000	
Description of Waste: _Soil_	containing less than 100 parts pe	er million of
kerosene		
	: 22 cu yds	
	troop alouge	
Special Handling Instructio	ns:	
Generator/Representative:		
- A / Fox city	) =	
Dennis Alexander ( Foodbald)	Denni- alyana (Signature)	11-3-37 (Date)
Transporter's Acknowledged	Peceint of Material:	, ,
James Wutchison (Name)	James Sulchoon	11-8-89
(Name)	(Signature)	(Date)
Disposal Facility Acknowled	ged Receipt of Material:	
J. Marko	1 Madie	11/4/60
(Name)	2. Modice (Signature)	///8/89 (Date)

January 10, 1992

Mr. William Meckel East Bay Municipal Utility District Wastewater Department - MS59 P.O. Box 24055 Oakland, California

Quarterly Monitoring Report #6 (October 8, 1991 through January 10, 1992) Wastewater Discharge Permit #001-00009 1330 Martin Luther King Jr. Way Oakland, California

Dear Mr. Meckel:

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SCI 430.015

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Notes are almost care to compare

This letter presents quarterly monitoring results groundwater treatment plant at 1330 Martin Luther King Jr. Way. Monitoring of treated effluent has been performed in accordance with criteria specified in the EBMUD wastewater discharge permit #001-00009, issued to the Oakland Redevelopment Agency remediation of hydrocarbon contaminated groundwater.

During the seventh quarter of operation (October 8, 1991 through January 10, 1992) approximately 1,544,660 gallons of treated water were discharged into the EBMUD sanitary sewer system. plant performance remains excellent. The analytical results from 34 sampling events indicate that total volatile hydrocarbons (TVH), benzene, toluene, xylene, and ethylbenzene (BTXE) and volatile organic compounds (VOC) have been reduced to nondetectable concentrations before discharge into the EBMUD sanitary sewer. No indications of breakthrough have occurred in the primary carbon Results of the water quality data generated during the seventh quarter are presented in Table 1. Data from the 9/26/91 sampling event is reprinted because the 2nd and 3rd rows were transposed in our letter dated October 9, 1991. Analytical test reports and Chain-of-Custody documents are also attached.

Approximately 922,170 gallons of contaminated water from the adjacent Garage 2 site were treated during this quarter of operation. The water contained low concentrations of chlorinated hydrocarbons. For this reason, the monitoring program was modified to include testing for EPA 8010 chemicals. No detectible

## Subsurface Consultants, Inc.

Mr. William Meckel East Bay Municipal Utility District SCI 430.010 January 10, 1992 Page 2

concentration of chlorinated hydrocarbons were discharged into the EBMUD sewer.

The analytical test results indicate that biologic activity within the primary holding tank, which was documented in previous quarterly reports, is on-going. Hydrocarbon concentrations up to approximately 140 parts per billion (ppb) are entering the primary holding tank and not more than 18 ppb of hydrocarbons have been recorded leaving the tank before passing through the carbon treatment system during this quarter. Consequently, hydrocarbon loading of the carbon treatment system has been minimal.

If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.

San O Consn

Sean O. Carson

Civil Engineer 45074 (expires 3/31/94)

SOC: JPB: vb

Attachments: Table 1 - Contaminant Concentrations in Water

Analytical Test Reports Chain-of-Custody Documents

cc:

Ms. Lois Parr

Oakland Redevelopment Agency, OEDE

/Mr. Paul Smith

**ACHCSA** 

Mr. Eddy So

RWQCB

Mr. Donnell Choy City of Oakland

Table 1. Contaminant Concentrations In Water

Sample	Sampling Date	TVH <sup>1</sup> (ug/L) <sup>3</sup>	Benzene <sup>2</sup> (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)	EPA 8010
$WI^4-32-1^5$ WI-32-2 $I^6-32$ $B^8-32$ $E^9-32$	09/26/91	240 180 ND NR NR	18 5.3 ND ND ND	ND <sup>7</sup> O.9 ND ND ND	3.4 2.0 ND ND ND	4.9 6.8 ND ND ND	NR <sup>10</sup> NR NR NR NR
WI-33-1 WI-33-2 I-33 B-33 E-33	10/24/91	90 ND	18 1.2 ND ND ND	ND ND ND ND	ND ND ND ND	ND 2.2 ND ND ND	NR NR NR NR NR
WI-34-1 WI-34-2 WI-34-G2 <sup>12</sup> I-34 B-34 E-34	11/18/91	140 70 ND	7.9 5.0 ND ND ND	ND ND ND ND ND	2.6 2.9 ND ND ND	4.1 0.7 ND ND ND	NR NR 6.9 <sup>11</sup> 3.7 <sup>13</sup> 15 <sup>11</sup> ND

<sup>1</sup> TVH = Total volatile hydrocarbons, EPA 8015/5030

BTEX, Analyses by EPA 8020/5030

ug/L = micrograms per liter or parts per billion (ppb)

WI = Well Influent, i.e. wastewater from well prior to discharge into the primary holding tank

<sup>5 -1</sup> indicates sample from Extraction Well #1

I = Influent at primary carbon vessel

ND = None detected, chemicals not present at concentrations above the detection limits; see test reports for detection limits

B = Between carbon vessels

<sup>9</sup> E = Effluent

NR = Test not requested

<sup>11</sup> as Methylene Chloride

G2 indicates sample from Garage 2

as 1-2 dichloroethane (DCA)



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

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

DATE RECEIVED: 11/15/91 DATE REPORTED: 11/21/91

LABORATORY NUMBER: 105808

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

RESULTS: SEE ATTACHED

Wilmington Berkeley

Los Angeles



CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

DATE RECEIVED: 11/15/91 DATE ANALYZED: 11/15,16/91

DATE REPORTED: 11/21/91

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)
			4.0	ND (A 6)	ND(0.5)	ND(0.5)
105808-1 105808-2	WI - 33 - 1 WI - 33 - 2	90 ND(50)			ND(0.5) $ND(0.5)$	2.2

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

QA/QC SUMMARY

1 RPD, % 90 RECOVERY, % 



CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

DATE ANALYZED: 11/15/91

DATE ANALYZED: 11/16/91 DATE REPORTED: 11/21/91

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020 Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT	ID	BENZENE ( a g / L )	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)	REPORTING LIMIT * (ug/L)
1 0 5 8 0 8 - 3 1 0 5 8 0 8 - 4 1 0 5 8 0 8 - 5	B - 33	• • <i>•</i> • • •	ND ND ND	ND ND ND	ND ND ND	ND ND ND	0.5 0.5 0.5

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

***************************************	
RPD, %	1
RECOVERY, %	90
	=====

<sup>\*</sup> Reporting Limit applies to all analytes.

DATE RECEIVED: 11/18/91 DATE REPORTED: 11/26/91

LABORATORY NUMBER: 105814

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

RESULTS: SEE ATTACHED

QA/QC Approval

Fina

Berkeley Wilmington Los Angeles



LABORATORY NUMBER: 105814 DATE RECEIVED: 11/18/91 CLIENT: SUBSURFACE CONSULTANTS DATE ANALYZED: 11/20/91 DATE REPORTED: 11/26/91

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

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	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES
		(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
105814-1	WI - 34 - 1	140	7.9	ND(0.5)	2.6	4.1
105814-2	WI - 34 - 2	7 0	5.0	ND(0.5)	2.9	0.7
105814-3	WI - 34 - G2	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 87 RECOVERY, % 



CLIENT: SUBSURFACE CONSULTANTS PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

DATE RECEIVED: 11/18/91

DATE ANALYZED: 11/20/91 DATE REPORTED: 11/26/91

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020 Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT	I D	BENZENE (ug/L)	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)	REPORTING LIMIT * (ug/L)
105814-4	I - 34		ND	ND	ND	ND	0.5
105814-5	B - 34		ND	ND	ND	ND	0.5
105814-6	E - 34		ND	ND	ND	NĐ	0.5

ND = Not detected at or above reporting limit.

<sup>\*</sup> Reporting Limit applies to all analytes.

QA/	OC	SUMMARY

2 RPD, % 87 RECOVERY, % 



LABORATORY NUMBER: 105814-3

CLIENT: SUBSURFACE CONSULTANTS PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

SAMPLE ID: WI-34-G2

DATE RECEIVED: 11/18/91

DATE ANALYZED: 11/20/91 DATE REPORTED: 11/26/91

EPA 8010

Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit
		$\mathbf{u}\mathbf{g}$ / $\mathbf{L}$
Chloromethane	ND	2.0
Bromome than e	ND	2.0
Vinyl chloride	ND	2.0
Chloroethane	ND	2.0
Methylene chloride	6.9	$\frac{-}{1}$ , $0$
Trichlorofluoromethane	ND	1.0
1,1-Dichloroethene	ND	1.0
1,1-Dichloroethane	ND	1.0
cis-1,2-Dichloroethene	ND	1.0
trans-1, 2-Dichloroethene	ND	1.0
Chloroform	ND	1.0
Freon 113	ND	1.0
1,2-Dichloroethane	ND	1.0
1,1,1-Trichloroethane	ND	1.0
Carbon tetrachloride	ND	1.0
Bromodich loromethane	ND	1.0
	ND	1.0
1,2-Dichloropropane	ND	1.0
cis-t,3-Dichloropropene	ND	1.0
Trichloroethylene	ND	1.0
1,1,2-Trichloroethane	ND	1.0
trans-1,3-Dichloropropene	ND ND	1.0
Dibromochloromethane		
2-Chloroethylvinyl ether	ND	2.0
Bromoform	ND	1.0
Tetrachloroethene	ND	1.0
1,1,2,2-Tetrachloroethane	ND	1.0
Chlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
I, 2-Dichlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

...\_....

QA/QC SUMMARY

Surrogate Recovery, % 



LABORATORY NUMBER: 105814-4

CLIENT: SUBSURFACE CONSULTANTS

PROJECT 1D: 430.015

DATE RECEIVED: 11/18/91

DATE ANALYZED: 11/20/91

LOCATION: MLK GW EXTRACTION

SAMPLE ID: I-34

#### EPA 8010 Purgeable Halocarbons in Water

Compound	Result	Reporting
	ug/L	Limit
		ug/L
Chloromethane	ND	2.0
Bromomethane	ND	2.0
Vinyl chloride	ND	2.0
Chloroethane	ND	2.0
Methylene chloride	ND	1.0
Trichlorofluoromethane	ND	1.0
1, I-Dichloroethene	ND	1.0
1, I-Dichloroethane	ND	1.0
cis-1,2-Dichloroethene	ND	1.0
trans-1,2-Dichloroethene	ND	1.0
Chloroform	ND	1.0
Freen II3	ND	1.0
1,2-Dichloroethane	3.7	1.0
1,1,1-Trichloroethane	ND	1.0
Carbon tetrachloride	ND	1.0
Bromodichloromethane	ND	1.0
1,2-Dichloropropane	ND	1.0
cis-1,3-Dichloropropene	ND	1.0
Trichloroethylene	ND	1.0
1,1,2-Trichloroethane	ND	1.0
trans-1,3-Dichloropropene	ND	1.0
Dibromochloromethane	ND	1.0
2-Chloroethylvinyl ether	ND	2.0
Bromoform	ND	1.0
Tetrachloroethene	ND	1.0
l, l, 2, 2-Tetrachloroethane	ND	1.0
Chlorobenzene	ND	1.0
1,3-Dichtorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0
l, 4-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

| Surrogate Recovery, % | 104



LABORATORY NUMBER: 105814-5 DATE RECEIVED: 11/18/91 CLIENT: SUBSURFACE CONSULTANTS DATE ANALYZED: 11/20/91 DATE REPORTED: 11/26/91

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

SAMPLE ID: B-34

EPA 8010 Purgeable Halocarbons in Water

Compound	Result	Reporting
•	ug/L	Limit
		$\mathbf{u}\mathbf{g}/\mathbf{L}$
Chloromethane	ND	2.0
Bromome than e	ND	2.0
Vinyl chloride	ND	2.0
Chloroethane	ND	2.0
Methylene chloride	15	1.0
Trichlorofluoromethane	ND	1.0
1,1-Dichloroethene	ND	1.0
l, l-Dichloroethane	ND	1.0
cis-l, 2-Dichloroethene	ND	1.0
trans-1,2-Dichloroethene	ND	1.0
Chloroform	ND	1.0
Freon 113	ND	1.0
l, 2-Dichloroethane	ND	1.0
l, l, l-Trichloroethane	ND	1.0
Carbon tetrachloride	ND	1 . 0
Bromodichloromethane	ND	1.0
l, 2-Dichloropropane	ND	1.0
cis-1,3-Dichloropropene	ND	1.0
Trichloroethylene	ND	1.0
l, l, 2 · Trichloro e than e	ND	1.0
trans-1,3-Dichloropropene	ND	1.0
Dibromochloromethane	ND	1.0
2-Chloroethylvinyl ether	ND	2.0
Bromoform	ND	1.0
Tetrachloroethene	ND	1.0
1,1,2,2-Tetrachloroethane	ND	1.0
Chlorobenzene	ND	1.0
l, 3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0
l, 4-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

Surrogate Recovery, %

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DATE RECEIVED: 11/18/91

DATE ANALYZED: 11/20/91 DATE REPORTED: 11/26/91

LABORATORY NUMBER: 105814-6
CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

SAMPLE ID: E-34

EPA 8010

Purgeable Halocarbons in Water

Compound	Result	Reporting
•	ug/L	Limit
		ug/L
Chloromethane	ND	2.0
Bromome than e	ND	2.0
Vinyl chloride	ND	2.0
Chloroethane	ND	2.0
Methylene chloride	ND	1.0
Trichlorofluoromethane	ND	1,0
1,1-Dichloroethene	ND	1.0
1,1-Dichloroethane	ND	1.0
cis-1,2-Dichloroethene	ND	1.0
trans-1,2-Dichloroethene	ND	1.0
Chloroform	ND	1.0
Freon 113	ND	1.0
1,2-Dichloroethane	ND	1.0
l,l,l-Trichioroethane	ND	1.0
Carbon tetrachloride	ND	1.0
Bromodichloromethane	ND	1.0
1,2-Dichloropropane	ND	1.0
cis-1,3-Dichloropropene	ND	1.0
Trichloroethylene	ND	1.0
1,1,2-Trichloroethane	ND	1.0
trans-1,3-Dichloropropene	ND	1.0
Dibromochloromethane	ND	1.0
2-Chloroethylvinyl ether	ND	2.0
Bromoform	ND	1.0
Tetrachloroethene	ND	1.0
1,1,2,2-Tetrachloroethane	ND	1.0
Chlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
l, 2-Dichlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

$\alpha$	1	QC.	SUMMARY	•
$\nabla \alpha$	,	$\mathcal{Q} \sim$	2 OMITICAL I	

Surrogate Recovery, % 106



CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

SAMPLE ID: METHOD BLANK

DATE ANALYZED: 11/20/91 DATE REPORTED: 11/26/91

EPA 8010

Purgeable Halocarbons in Water

Compound	Result	Reporting
	$\mathbf{u}\mathbf{g}/\mathbf{L}$	Limit
		ug/L
Chloromethane	ND	2.0
Bromome than e	ND	2.0
Vinyl chloride	ND	2.0
Chloroethane	ND	2.0
Methylene chloride	1.1	1.0
Trichlorofluoromethane	ND	1.0
1,1-Dichloroethene	ND	1.0
1,1-Dichloroethane	ND	1.0
cis-1,2-Dichloroethene	ND	1.0
trans-1,2-Dichloroethene	ND	1.0
Chloroform	ND	1.0
Freen 113	ND	1.0
1,2-Dichloroethane	ND	1.0
1,1,1-Trichloroethane	ND	1.0
Carbon tetrachloride	ND	1.0
Bromodichloromethane	ND	1.0
1,2-Dichloropropane	ND	1.0
cis-1,3-Dichloropropene	ND	1.0
Trichloroethylene	ND	1.0
1,1,2-Trichloroethane	ND	1.0
trans-1,3-Dichloropropene	ND	1.0
Dibromochloromethane	ND	1.0
2-Chloroethylvinyl ether	ND	2.0
Bromoform	ND	1.0
Tetrachloroethene	ND	1.0
1,1,2,2-Tetrachloroethane	ND	1.0
Chlorobenzene	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0

ND = Not detected at or above reporting limit.

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#### QA/QC SUMMARY



BS/BSD SUMMARY SHEET FOR EPA 8010(8020)

INSTRUMENT: HP-5890 COLUMN: RESTEX 502.2 DETECTORS: HALL/PID

Operator: Analysis date:

Sample type:

AV 11/19/91

WATER

Spike file: 323W/X014 Spike dup file: 323W\X015

Instrument:GC12

Sequence name NOV 19

8010 BS/BSD DATA (spike	d at 20 ppb	)		Av	e Rec=	106 %	<del></del>
	:========= :a	EADING	RECOVER'	·	STATUS	LIMIT	 S
SPIKE COMPOUNDS	17.	20.50	1.03		OK		- 145
1,1-Dichloroethene			107				- 120
Trichloroethene		21.43					
Chlorobenzene		20.72	104	ર્જ	OK	/5	- 130
SPIKE DUP COMPOUNDS							
1,1-Dichloroethene		21.44					- 145
Trichloroethene		22.16			OK		- 120
Chlorobenzene		21.25	106	%	OK	75	- 130
SURROGATES							
BROMOBENZENE (BS)		104.00	104	%	OK	75	- 120
		106.00	106		OΧ		- 120
BROMOBÉNZENE (BSD)		100.00		•	0		<b></b>
8020 BS/BSD DATA (spike	d at 20 ppb	·)		Αv	e Rec=	102 %	
		EADING	RECOVER	ч У	STATUS	LIMITS	 }
SPIKE COMPOUNDS	10	20.74					- 127
Benzene							- 125
Toluene		20.72		6	OK		- 130
Chlorobenzene		20.17	101	ર્જ	OK	/5	- T20
SPIKE DUP COMPOUNDS							
Benzene		20.55	103	ે	OK		- 127
Toluene		20.52	103	જ	OK		- 125
Chlorobenzene		19.93	100	%	OK	75	- 130
SURROGATES							
BROMOBENZENE (BS)		100.00	100	2	OK	75	- 120
"		100.00			OK		- 120
BROMOBENZENE (BSD)		100.00	1,00	• •	OI	, 3	
RPD DATA	801	.0 RPD=	3.5 %		8020	RPD≕	1.0 %
	CDIVE CY		======= RP		STATUS	 LIMIT '	===== 3
8010 COMPOUNDS		PIKE DUP			OK	د مقاملية المعالية . ا	< 14
1,1-Dichloroethene	20.50	21.44		%			
Trichloroethene	21.43	22.16		%	OK		
'Chlorobenzene	20.72	21.25	3	%	OK		< 13
8020 COMPOUNDS							
Benzene	20.74	20.55	1	. %	CK		< 11
Toluene	20.72	20.52		્રે	CK		< 13
Chlorobenzene	20.17	19.93		3	СK		< 13
Curacobeuzeue	40.1.7		*	. •			

REVIEWED BY:

neel Che



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

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

DATE RECEIVED: 09/26/91 DATE REPORTED: 09/30/91

LABORATORY NUMBER: 105275

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

RESULTS: SEE ATTACHED

QA/QC Approval

Los Angeles



CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

DATE RECEIVED: 09/26/91
DATE ANALYZED: 09/28/91

DATE REPORTED: 09/30/91

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020 Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT ID	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES	REPORTING LIMIT *
		( u g / L )	(ug/L)	(ug/L)	(ug/L)	(ug/L)
105275-3	I - 32	ND	ND	ND	ND	0.5
105275-4	B - 32	ND	ND	ND	ND	0.5
105275-5	E - 32	ND	ND	ND	ND	0.5

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

RPD, %	4
RECOVERY, %	112

<sup>\*</sup> Reporting Limit applies to all analytes.



CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

DATE RECEIVED: 09/26/91 DATE ANALYZED: 09/28/91 DATE REPORTED: 09/30/91

DATE REPORTED: 49/30/91

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	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
105275-1	WI - 32 - 1 WI - 32 - 2	2 4 0 1 8 0	18 5.3	ND(0.5) 0.9	3.4	4.9

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

CHAIN OF CUSTODY FORM	USTODY FO	RM			PAGE OF
PROJECT NAME:	メース	$\Im$	Extraction		ANALYSIS REQUESTED
JOB NUMBER:	430.0	015	LAB:	Curtis + Tompkins Had	
PROJECT CONTACT:	CT: Sean	M Carso	5	DUND: Norwal	37 33
SAMPLED BY:			REQUESTED BY:	TED BY: Sean Carson	XT8
		MATRIX	CONTAINERS	METHOD SAMPLING DATE	Ð 7
LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	RATER SOIL STSAW RIA	АОУ ЯЭТІЈ ТИІЯ ЗВОТ	HCC WONTH DAY YEAR TIME	H/T )
	WI-32-1	XX	3.00	XX 0 3 2 6 0 X XX	XX
	1 1		2	X	
	3-32	X	2		
	E-32	X	2	X	
TON 8 STREET	- B-3:			$ \overline{\alpha} $	
COMMENS & NOTES.	į			BY: (Signature) DATE/TIME	RECEIVED BY: (Signature) UNLE/ TIME
				RELEASED BY: (Signature) DATE/TIME RECEI	RECEIVED BY: (Signature) DATE/TIME
				The state of the s	DATE/
				RELEASED BY: (Signature) DALE/ IIME   MECA	Charle alan 1030
					-
				Subsurface Consultants, Inc.	ultants, Inc.
				(510) 268-0461 · FAX: 510	268-0137

CHAIN OF C	CHAIN OF CUSTODY FORM	HM			PAGE OF
PRO IECT NAME:	N N N	G W J	reatment Plant	Plant	ANALYSIS REQUESTED
JOB NUMBER:		015	LAB:	Curtis + Tompkins	
PROJECT CONTACT:	NCT: Sean	1 Carson	TURNAROUND:	UND: NOVING!	
SAMPLED BY:	Charles	Pearson	MEQUESTED BY:	ED BY:	=XX
		MATERIX	CONTAINERS	METHOD PRESERVED SAMPLING DALE	37/181/
LABORMORY I.D. NUMBER	SCI SAMPLE NUMBER	Rater Soil Beaw Aia	AOV RƏTLI TUIQ B8UT	DAY YEAR TIIN	KIEI 1-1/1 >
	WI-33-1 WI-33-2		NN	X	
	T-33	X	2	 	
	1	×	2	,	
	H-33	<u> </u>	7		
		و و دوران و دو		T CHAIN OF CLISTODY RECORD	RECORD
COMMENTS & NOTES:	11ES:			RELEASED BY Signature), DATE/TIME RECEIVED BY	nature)
				HELEASED BY: (Signature) DATE/TIME RECEIV	
				RELEASED BY: (Signature) DAIE/ IIME RECEN	RECEIVED BY: (Signature) DATE / HME
				Subsurface Consultants, In	CONSULTANTS, INC.
				(0.10) -845 (0.10)	

CHAIN OF CUSTODY FORM	ISTODY FOF	Z.			PAGEOF
DOO ITOT NIANGE.	X	3 U	Treatmen	ent Plant	ANALYSIS REQUESTED
PHOJECT NAME:IOB NUMBER:	430.015	1 / 3	LAB:	Curtis + Tompkins	
PROJECT CONTACT:	T: Sean (	Carson	TURNAROUND:	JND: Normal	
SAMPLED BY:	e / No	o Velez	REQUESTED BY:	ED BY:	C C C
		MATRIX	CONTAINERS	METHOD SAMPLING DATE	J V F
LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	Mataw Jios Straw Ala	АОУ ЯЗТІ. ТИІЯ 38UT	HOS MONTH DAY YEAR TIME	1VT (TS 8 493
	WI-34-1		<u>(U) (V) :</u>	- C	
	WI-34-622	× .	9 9		XX
			000		XX
	E - 3 <sup>-1</sup>		9	x	
COMMENTS & NOTES:	is: sample	date	11 18 91	RELEASED BY: (Signature) DAJE/TIME RECEIVED BY: (Signature) 1/1/8	TODY RECORD  RECEIVED BY: (Signature) DAIE/TIME
Juvas-	sorrple bothles say 11/15/9	Jus S	11/12/01	NTE/TIME	RECEIVED BY: (Signature) DATE/TIME
_			-	RELEASED BY: (Signature) DATE/TIME RECE	RECEIVED BY: (Signature) / DATE/TIME
					-
				Subsurface Consultants, Inc.	ultants, Inc.
				1010) X02-0401 (01C)	1010-002-

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\$1007:1 11:27

October 9, 1991 SCI 430.015

Mr. William Meckel
East Bay Municipal Utility District
Wastewater Department - MS59
P.O. Box 24055
Oakland, California

Quarterly Monitoring Report #6 (July 10 thru October 8, 1991) Wastewater Discharge Permit #001-00009 1330 Martin Luther King Jr. Way Oakland, California

Dear Mr. Meckel:

This letter presents quarterly monitoring results from the groundwater treatment plant at 1330 Martin Luther King Jr. Way. Monitoring of treated effluent has been performed in accordance with criteria specified in the EBMUD wastewater discharge permit #001-00009, issued to the Oakland Redevelopment Agency for remediation of hydrocarbon contaminated groundwater.

During the sixth quarter of operation (July 10th through October 8, 1991) approximately 626,210 gallons of treated water were discharged into the EBMUD sanitary sewer system. Treatment plant performance remains excellent. The analytical results from 32 sampling events indicate that total volatile hydrocarbons (TVH), benzene, toluene, xylene, and ethylbenzene (BTXE) and volatile organic compounds (VOC) have been reduced to nondetectable concentrations before discharge into the EBMUD sanitary sewer. No indications of breakthrough have occurred in the primary carbon column. Results of the water quality data generated during the sixth quarter are presented in Table 1. Analytical test reports and Chain-of-Custody documents are also attached.

Approximately 105,000 gallons of contaminated water from the adjacent Garage 2 site were treated during the first part of this quarter of operation. The water contained low concentrations of chlorinated hydrocarbons. For this reason, the monitoring program was modified to include testing for EPA 8010 chemicals.

The analytical test results indicate that biologic activity within the primary holding tank, which was documented in previous quarterly reports, is on-going. Hydrocarbon concentrations up to

Subsurface Consultants, Inc.

171 12th Street • Suite 201 • Oakland, California 94607 • Telephone 415-268-0461 • FAX 415-268-0137

Mr. William Meckel East Bay Municipal Utility District SCI 430.010 October 9, 1991 Page 2

approximately 1300 parts per billion (ppb) are entering the primary holding tank and not more than 130 ppb of hydrocarbons have been recorded leaving the tank before passing through the carbon treatment system. Consequently, hydrocarbon loading of the carbon treatment system has been minimal.

If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.

Sean O. Carson

Civil Engineer 45074 (expires 3/31/94)

SOC: JPB: ddh

Attachments:

Table 1 - Contaminant Concentrations in Water

Analytical Test Reports Chain-of-Custody Documents

cc:

Ms. Lois Parr

Oakland Redevelopment Agency, OEDE

Mr. Paul Smith

**ACHCSA** 

Mr. Lester Feldman

RWQCB

Mr. Donnell Choy City of Oakland

Table 1. Contaminant Concentrations In Water

Sample	Sampling Date	TVH <sup>1</sup> (ug/L) <sup>3</sup>	Benzene <sup>2</sup> (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)	EPA 8010
$WI^4-30-2^5$	07/23/91	1300	170	71	22	100	NR <sup>10</sup>
$WI-30-G2^{12}$		ND <sup>7</sup>	NE	ND	ND	ND	1.1 <sup>11</sup>
$I^6-30$		ND	ND	ND	ND	1.7	ND
$B^8-30$		ND	ND	ND	ND	ND	ND
$E^9-30$		ND	ND	ND	ND	ND	ND
WI-31-2	08/26/91	790	91	20	9.3	62	NR
I-31		130	0.6	ND	ND	3.2	NR
B-31		ND	ND	ND	ND	ND	NR
E-31		ND	ND	ND	ND	ND	NR
WI-32-1	09/26/91	240	18	ND	3.4	4.9	NR
WI-32-2		NR	ND	ND	ND	ND	NR
I-32		180	5.3	0.9	2.0	6.8	NR
B-32		NR	ND	ND	ND	ND	NR
E-32		NR	ND	ND	ND	ND	NR

TVH = Total volatile hydrocarbons, EPA 8015/5030

BTEX, Analyses by EPA 8020/5030

<sup>&</sup>lt;sup>3</sup> ug/L = micrograms per liter or parts per billion (ppb)

WI = Well Influent, i.e. wastewater from well prior to discharge into the primary holding tank

<sup>5 -2</sup> indicates sample from Extraction Well #2

I = Influent at primary carbon vessel

ND = None detected, chemicals not present at concentrations above the detection limits; see test reports for detection limits

B = Between carbon vessels

<sup>9</sup> E = Effluent

NR = Test not requested

<sup>11</sup> as Tetrachlorethene

<sup>12</sup> G2 indicates sample from Garage 2



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

2323 Fifth Street, Berkeley, CA 9471O, Phone (415) 486-0900

DATE RECEIVED: 07/23/91 DATE REPORTED: 07/25/91

LAB NUMBER: 104582

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

RESULTS: SEE ATTACHED

QA/QC Approval

Final Appr

Los Angeles



LABORATORY NUMBER: 104582

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

DATE RECEIVED: 07/23/91
DATE ANALYZED: 07/23/91
DATE REPORTED: 07/25/91

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	TOLUENE	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
104582-1	W1 - 30 - 2	1,300	170	7 1	2 2	100
104582-2	WI - 30 - G2	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
104582-3	I - 30	ND(50)	1.2	ND(0.5)	ND(0.5)	ND(0.5)
104582-4	B - 30	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
104582-5	E-30	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, % <1
RECOVERY, % 99



DATE RECEIVED: 07/23/91 LABORATORY NUMBER: 104582-2 CLIENT: SUBSURFACE CONSULTANTS DATE ANALYZED: 07/23/91 DATE REPORTED: 07/25/91

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

SAMPLE ID: WI-30-G2

EPA 8010 Purgeable Halocarbons in Water

Compound	Result	Reporting
	ug/L	Limit
		ug/L
chlorome than e	ND	2.0
bromome than e	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
l, l-dichloroethene	ND	1.0
l, l-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
l, 2-dichloroethane	ND	1.0
l, l, l-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodich lorome than e	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	1.1	1.0
I, 1, 2, 2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
l, 2-dichlorobenzene	ND	1.0
l, 4-dichlorobenzene	ND	1.0
•		

ND = Not detected at or above reporting limit.

## QA/QC SUMMARY

RPD, %	8
RECOVERY, %	8 2



DATE RECEIVED: 07/23/91 LABORATORY NUMBER: 104582-3 CLIENT: SUBSURFACE CONSULTANTS DATE ANALYZED: 07/23/91 PROJECT ID: 430.015 DATE REPORTED: 07/25/91

LOCATION: MLK GW EXTRACTION

SAMPLE ID: I-30

### EPA 8010 Purgeable Halocarbons in Water

Compound	Result ug/L	Reporting Limit
		ug/L
chloromethane	ND	2.0
bromome than e	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
l, l-dichloroethane	ND	1.0
cis-l, 2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freen 113	ND	1.0
1,2-dichloroethane	ND	1.0
I, I, I-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodich loromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-I,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0
1, 3 - WICHIOLODONZONO	112	

ND = Not detected at or above reporting limit.

## QA/QC SUMMARY

RPD, %	8
RECOVERY, %	8 2



DATE RECEIVED: 07/23/91 LABORATORY NUMBER: 104582-4 DATE ANALYZED: 07/23/91 CLIENT: SUBSURFACE CONSULTANTS DATE REPORTED: 07/25/91

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

SAMPLE ID: B-30

#### EPA 8010 Purgeable Halocarbons in Water

Compound	Result	Reporting
•	ug/L	Limit
		ug/L
chlorome than e	ND	2.0
bromome than e	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
l, l-dichloroethene	ND	1.0
1,1-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freon 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodich loromethane	ND	1.0
l, 2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromo form	NĐ	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
l, 3 - dichlorobenzene	ND	1.0
l, 2-dichlorobenzene	ND	1.0
l, 4-dichlorobenzene	ND	1.0
	• .	

ND = Not detected at or above reporting limit.

OA	/OC	SUMMAR	Y
V / 1	/ 🗸 🗸	COLVINIA	

8 RPD, % 82 RECOVERY, % 



DATE RECEIVED: 07/23/91 DATE ANALYZED: 07/23/91 LABORATORY NUMBER: 104582-5 CLIENT: SUBSURFACE CONSULTANTS PROJECT ID: 430.015 DATE REPORTED: 07/25/91

LOCATION: MLK GW EXTRACTION

SAMPLE ID: E-30

EPA 8010

Purgeable Halocarbons in Water

Compound	Result	Reporting
0 0 mp 0 2 m m	ug/L	Limit
		ug/L
chloromethane	ND	2.0
bromome than e	ND	2.0
vinyl chloride	ND	2.0
chloroethane	ND	2.0
methylene chloride	ND	2.0
trichlorofluoromethane	ND	1.0
1,1-dichloroethene	ND	1.0
I, I-dichloroethane	ND	1.0
cis-1,2-dichloroethene	ND	1.0
trans-1,2-dichloroethene	ND	1.0
chloroform	ND	1.0
freen 113	ND	1.0
1,2-dichloroethane	ND	1.0
1,1,1-trichloroethane	ND	1.0
carbon tetrachloride	ND	1.0
bromodichloromethane	ND	1.0
1,2-dichloropropane	ND	1.0
cis-1,3-dichloropropene	ND	1.0
trichloroethylene	ND	1.0
1,1,2-trichloroethane	ND	1.0
trans-1,3-dichloropropene	ND	1.0
dibromochloromethane	ND	1.0
2-chloroethyl vinyl ether	ND	2.0
bromoform	ND	1.0
tetrachloroethene	ND	1.0
1,1,2,2-tetrachloroethane	ND	1.0
chlorobenzene	ND	1.0
1,3-dichlorobenzene	ND	1.0
1,2-dichlorobenzene	ND	1.0
1,4-dichlorobenzene	ND	1.0
•		

ND = Not detected at or above reporting limit.

QA/	QC	SUMMARY

RPD, %	8
RECOVERY, %	8 2
RECOVERT, 70	



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

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

DATE RECEIVED: 08/26/91 DATE REPORTED: 08/30/91

RECEIVED

SEP 4 1991 PM 718191011112111213141516

LABORATORY NUMBER: 104962

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK EXTRACTION

RESULTS: SEE ATTACHED

QA/QC Approval

Final Approve

Berkeley Wilmington Los Angeles



LABORATORY NUMBER: 104962

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK EXTRACTION

DATE RECEIVED: 08/26/91 DATE ANALYZED: 08/27/91

DATE REPORTED: 08/30/91

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)		TOTAL XYLENES (ug/L)
104962-1	WI - 31 - 2	790	91	20	9.3	62
104962-2	1-31	130	0.6	ND(0,5)	ND(0,5)	3.2

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

QA/QC SUMMARY

RPD, % <1 107 RECOVERY, %



LABORATORY NUMBER: 104962

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK EXTRACTION

DATE RECEIVED: 08/26/91

DATE ANALYZED: 08/27/91

DATE REPORTED: 08/30/91

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020 Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT I	D BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES	REPORTING LIMIT *
		( u g / L )	( u g / L )	(ug/L)	(ug/L)	(ug/L)
104962-3	B - 31	ND	ND	ND	ND	0.5
104962-4	E - 31	ND	ND	ND	ND	0.5

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

RPD, %

RECOVERY, %

107

<sup>\*</sup> Reporting Limit applies to all analytes.



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

2323 Fifth Street, Berkeley, CA 9471O, Phone (415) 486-0900

DATE RECEIVED: 09/26/91 DATE REPORTED: 09/30/91

LABORATORY NUMBER: 105275

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

RESULTS: SEE ATTACHED

QA/QC Approval

Los Angeles



LABORATORY NUMBER: 105275

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

DATE RECEIVED: 09/26/91
DATE ANALYZED: 09/28/91

DATE REPORTED: 09/28/91

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020 Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT	ID	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES	REPORTING LIMIT *
			(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
105275-3	I - 32		ND	ND	ND	ND	0.5
105275-4	B - 32		ND	ND	ND	ND	0.5
105275-5	E - 32		ND	ND	ND	ND	0.5

ND = Not detected at or above reporting limit.

#### QA/QC SUMMARY

RPD, %

RECOVERY, %

112

<sup>\*</sup> Reporting Limit applies to all analytes.



LABORATORY NUMBER: 105275

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.015

LOCATION: MLK GW EXTRACTION

DATE RECEIVED: 09/26/91
DATE ANALYZED: 09/28/91
DATE REPORTED: 09/30/91

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	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES
			(ug/L)	(ug/L)	( u g / L )	(ug/L)	ATES:(ED
105275-1 105275-2	WI - 32 - 1 WI - 32 - 2	_	240	18 5.3	ND(0.5) 0.9	3.4	4.9

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

QA/QC SUMMARY

RPD, %

RECOVERY, %

112

## Subsurface Consultants

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name	ə:	MLK	GW	Extra	ction	
SCI Job Numb	er:		430,	015		
Project Cont	tact at SC	I:	Sec	an C	crson	
Sampled By:			c 1	ar les	Pearse	N
Analytical I				urti	s + Tow	
Analytical '					pid	
Sample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling Date	<u>Hold</u>	Analysis	Analytical Method
WI-30-2	$\underline{\sim}$	V×3	7/23/91	·	TVH/BIXE	8015/8020/5030
WI-30-G2	$\overline{\mathcal{W}}$	<u>V*3</u>	7/23/91			VOCS 8015/8030/503
<u>I-30</u>	$\mathcal{N}_{-}$	V × 3	7/23/91		TVH/BIXE/	1006 8015/8020/5030
B-30	$\underline{\hspace{1cm}}$	V×3	7/23/91		TVH/BIXE/	10C2 8012/8020/5030
E-30	$\overline{\mathcal{M}}$	V×3	7/23/91		TVH/BTKE/	VOCS 8010/5030
						**************************************
				<del>, , ,</del>		
*	*				* *	
Released by	: Charles C. ple	Rece	ived by:		Date: _	7/23/91
			eived by:			-
Received by	Laborator	y: Mama	y Who		Date: _	7/23/91
Released by			1			
Released by	•				Date:	
1 Sample T	wne: W =	 Water S =	: Soil. 0 = (	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

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

# Subsurface Consultants

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

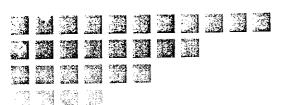
Project Nam	e:	MLK	<u>ew</u>	Extrec	trois	
SCI Job Num	ber:	<u>'</u>	130,010	<u> </u>		
Project Con	tact at SC	CI:	Secn (	<u>Cerso</u>	<u> </u>	
Sampled By:			Charle	s Pec	12 CrJ	
Analytical	Laboratory	<i>z</i> :	Cycf	15 -TC	mpkins	Ltd
Analytical	Turnaround	l:		Dormal		
Sample ID WIT-31-2	Sample Type:	Container Type <sup>2</sup> VxZ	Sampling Date S/Z6/9	Hold	Analysis TVH/BT	Analytical Method  XE 50/5/5020/5030
I-31	W	V.Z	9/26/91		TVH/BIXE	= 4013/8022/503C
B-3i	- W	VZ	9/26/91		BIXE	<u> </u>
<b>E</b> -31	$\sim$	V.2	9/24/71		BIXE	<u> 3020/5030</u>
				<u></u>		<del></del>
				<del></del>		
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* Released by		* * Rece	* ived by:		* Date:	* 5/24/41
Released by	:	Reces	ived by:		Date:	
Received by	Laborato	tā: <u> </u>	<u> </u>		Date:	30 F 2
Released by	Laborato				Date:	
Released by	·:				Date:	
Sample T Containe	'ype: W = ir Type: V	Water, S = = VOA, P =	Soil, O = Plastic, G	Other (s	specify) s, T = Bras	ss Tube,

#### NOTES TO LABORATORY:

<sup>0 =</sup> Other (specify)

<sup>-</sup> 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	<b>USTODY FO</b>	RM			PAGE OF
PBO IECT NAME:	メレメ		Extraction		ANALYSIS REQUESTED
JOB NUMBER:	430.	015	LAB:	Curtis + Tompkins Ltd	
PROJECT CONTACT:	.ct: Seak	M Carso	5	TURNAROUND: Normal  REQUESTED BY: Sean Carson	ax. TXE
		MATRIX	CONTAINERS	METHOD CAMBING DATE	ව ව
LABORATORY I.D. NUMBER	SCI SAMPLE NUMBER	MATER SOIL STRAW SIA	AOV   UTER   1907   UTER   1907   190	HI &	HALX
	WI-32-1 WI-32-2		000		
	T-32		2		
	E.32	X	7	X	
COMMENTS & NOTES:	TES:			HAIN OF CUSTONE/TIME	TODY RECORD  RECEIVED BY: (Signature) DATE/TIME
				BY: (Signature) DALE/ Lime	
					Contract Contract
				Subsurface Consultants, Inc. 1711 12TH STREET, SUITE 201, OAKLAND, CALIFORNIA 94607 (510) 268-0461 - FAX: 510-268-0137	Ultants, Inc.



July 23, 1991 SCI 430.017 91 302 85 17112: 53

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

Water Release from Treatment Plant 1330 Martin Luther King, Jr. Way Old Firehouse Site Oakland, California

Dear Mr. Esposito:

The purpose of this letter is to document our understanding of events leading up to and following a release of water from the referenced treatment facility. The basis of our understanding is (1) discussions with Mr. Frank Jurado of HSR, Inc. and their letter dated July 15, 1991, and (2) our personal observations. A copy of the July 15th HSR letter is attached. We note that the date on the letter is incorrect; it should be July 22. Additionally, some of the dates referenced in the letter are also inaccurate. However, their reference to individual days is correct, i.e., Saturday and Sunday. We have discussed these discrepancies with Mr. Keith Dorsa of HSR and he has acknowledged them.

The attached HSR letter summarizes details of their observations. We have reviewed the letter and conclude that it is relatively complete and accurate from SCI's standpoint. We make the following additional comments.

In brief, the primary holding tank for the water treatment facility was overtopped on Sunday, July 21, 1991. Our best estimate is that overtopping resulted in a release of approximately 500 gallons or less of groundwater. The release caused water to accumulate onsite adjacent to the tank. According to HSR, no water flowed offsite and into the storm drain system. All water seeped into the surface soils near the north end of the tank.

The cause of the release was associated with the failure of level sensors in the tank. HSR personnel or subcontractors removed and reinstalled the sensors in the tank on Saturday, July 20. Reinstallation of the sensors was inadvertently done in a manner

## Subsurface Consultants, Inc.

171 12th Street • Suite 201 • Oakland, California 94607 • Telephone 415-268-0461 • FAX 415-268-0137

Mr. John Esposito Bramalea Pacific SCI 430.017 July 23, 1991 Page 2

that did not allow them to function properly. Sean Carson of SCI, on Sunday, July 21, at approximately 6:00 p.m., inspected the treatment plant and corrected the condition. He reestablished functioning of the treatment facility. HSR personnel removed the level sensors without SCI's knowledge. A key to the facility was provided to HSR by SCI because of their need to install their own pump shut-off level sensors in the tank and discharge pipeline. It was also necessary for them to gain intermittent access to the facility to monitor the transfer of groundwater from their holding tanks.

HSR reports that in their opinion, the quantity of water released was on the order of several hundred gallons. This estimate appears to agree reasonably well with (1) our estimate based on available freeboard within the tank and the rate at which groundwater was being discharged into the system by SCI (about 3 gpm), and (2) our observations of the wetted area on Monday morning, after the release.

The water released was from the primary holding tank of the treatment facility and hence, may have contained low levels of petroleum hydrocarbons. Analyses that were previously conducted by SCI indicated that the influent being discharged into the tank contained the following concentrations of hydrocarbons.

Sample	Sampling Date	TVH (ug/L) <sup>3</sup>	Benzene (uq/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
WI-29-2	06/24/91	1300	150	56	22	92

The actual concentrations of hydrocarbons in the released water are uncertain because average concentrations in the tank are substantially less than the influent. Substantial dilution occurs within the tank.

In accordance with your instructions, we have notified the Alameda County Health Care Services Agency of the release on Monday, July 22.

Mr. John Esposito Bramalea Pacific SCI 430.017 July 23, 1991 Page 3

If you have any questions or require additional information, please call.

Yours very truly,

Subsurface Consultants, Inc.

James P. Bowers

President

Geotechnical Engineer 157 (expires 3/31/95)

SOC:JPB:clh

cc:

Ms. Lois Parr, City of Oakland Redevelopment Agency

Mr. Donnell Choy, City of Oakland

Mr. Paul Smith, Alameda County Health Care Services Agency

Attachment: HSR letter dated July 15, 1991

3851 Charter Park Drive, Suite A • San Jose, California 95136 • Phone 408-265-4300 Fax 408-265-1664

July 15, 1991

Mr. David Ferworn Schnabel Foundation Company 3075 Citrus Circle, Suite 150 Walnut Creek, CA 94598

RE: Water Treatment System Overflow Summary

#### Dear David:

The following is a brief description of the events surrounding the slight overflow of water from the treatment system located at the intersection of 14th and Martin Luther King Jr. Way.

On Saturday, July 22, HSR installed the electrical system which runs the dewatering process. This included installing the pumps in the wells, the pump in the HSR supplied Baker Tanks on 13th Street, and placing a level sensor and control box on the influent Baker Tank on the treatment system.

The level control system in the treatment system tank has the specific purpose of shutting off the transfer pump in the HSR Baker Tanks when the treatment system nears capacity. During the placement of the level control system, it was necessary to measure the depth of the sensors used to regulate the water level in the treatment system tank to assure that our level controls were placed at a correct depth to work in a synchronized manner with the existing system.

The sump pump in the treatment system tank in regulated by a float bulb similar to the type HSR installed to regulate flow into the tank.

Upon the completion of the dewatering system setup, HSR performed a system checkout. The well pumping system was tested, as well as the Baker Tank transfer system. At 5:00 P.M., approximately 500 gallons of water were pumped from the HSR tank to the treatment system tank. When the water level in the treatment tank rose to the predetermined shutoff height, the level control system shut off the transfer pump in the HSR tank as designed.

Although the water level in the treatment system was high, the sump pump in the treatment tank did not begin to operate. HSR was unsure why the treatment system did not start to pump water through the system, since the water in the treatment tank appeared to be high enough to activate the treatment system. HSR inspected the circuit breaker box which supplies the

treatment system with power. None of the circuit breakers were tripped. Since power was available to all of the different units in the treatment system, HSR felt that there were two rational reasons why the pump in the treatment system might not be operating:

- 1. Maybe the treatment system sump pump was run on a time delay.
- 2. A relay in one of the treatment system electrical panels had been "chattering" (clicking on and off in rapid fashion) for several days prior to Saturday. No chattering was heard from the electrical box at this time. If this relay was responsible for activating the pump, maybe the chattering had burned out the relay points, causing the pump to be inoperative.

Although the pump was not functioning for whatever reason, HSR was confident that this would not create a problem. The level control which governed the HSR transfer pump worked correctly, so no additional water would be transferred to the treatment system if the treatment system continued to not operate. The wells which normally supply the treatment system with it's only source of water continued to pump 3 gallons of water per minute into the treatment system tank. This was not felt to be a problem because Sean Carson of Subsurface Consultants had previously shown HSR the emergency shut off sensors in the tank. The sensors were wired to automatically shutoff the well pumps operated by Subsurface Consultants if the water in the tank reached a very high level.

HSR continued to pump water from the dewatering wells into the HSR Baker Tank, knowing that no water would be transferred to the treatment system unless the water level in the treatment tank dropped due to the activation of the treatment sump pump.

The flow rate into the HSR Baker Tanks was evaluated, and it was calculated that the 40,000 gallon storage capacity was sufficient to continue dewatering operations through the night without transferring water to the treatment system.

HSR departed the sight at 6:45 P.M.

On Sunday, July 21, HSR returned to the sight at 12:30 P.M. The HSR Baker Tanks were noted to be 75% full. Upon inspection of the treatment system area, it was noted that the systems storage tank was completely full and a small amount of water had overflowed onto the ground. It was observed that the one of the wells operated by Subsurface Consultants was still pumping water into the treatment system at this time. In order to stop the flow of water, HSR released the circuit breaker governing the pump in the well operated by Subsurface Consultants. All flow into the treatment system tank ceased.

Since the treatment system was inoperative and the HSR storage capacity was nearing maximum, it was decided to shut down the dewatering operation until the treatment system was properly operating. Phone calls were placed to the answering machines of George Ford of Woodward-Clyde and Sean Carson of Subsurface to make them aware of the situation as soon as possible.

HSR departed the sight at 2:00 P.M.

On Monday, July 22, HSR met with Sean Carson at the treatment system. Sean had discovered the problem with the system. The electrical cord of a float sensor responsible for turning on the system's pump had been pulled up slightly such that the float bulb was held in place by the cord's tie down. This caused the bulb to be unable to float, so the pump was unable to function.

The problem was already rectified by Sean Carson, and the treatment system was operating correctly. Sean stated that his emergency shutoff system had failed to operate correctly, causing the overflow. HSR reactivated its well pumps and began transferring water to the treatment system.

Matt Sherrill of Bramalea Pacific and Jim Bowers of Subsurface Consultants visited the treatment facility. Jim Bowers stated that the volume of water which overflowed was negligible, and that dewatering progress should continue. Dewatering was commenced.

If you have any questions regarding this summary, please do not hesitate to contact me.

Graciously,

Denny McIlvaine Project Manager



# ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY DEPARTMENT OF ENVIRONMENTAL HEALTH HAZARDOUG MATERIALS DIVISION 80 SWAN WAY, ROOM 200: OAKLAND, CA 94621 415/271-4320

[ ] [X]	HAZARDOUS MATERIALS RELEASE AND NOTIFICATION REPORT (H&SC 25180.7) EMERGENCY RESPONSE
1.	INFORMATION RECEIVED BY: law 5mith
	DATE: 12291 TIME: 4:20 pm
2.	THE: 4:20 pm  THE TIME: 4:20 pm  THE DENT LOCATION: 1330 Mortin Like King Jr way  CITY: Oakland 7TP CODE: 94612
3.	DATE OF INCLOUNT: 7/21/91 TIME OF INCLOUNT: 11:30 AM
4.	REPORTED BY: Jim Bowers AGENCY: 565 Consultants  ADDRESS: 171 12th Street Soil 201 CTTY, ZIP: Oakland 94607  TELEPHONE: 268-0461 CONTACT:  PHONE:
5.	TYPE OF DISCHARGE:  [ ] Discharge from vehicle License Plate No.  Manifest/Shipping Information:  [ ] Abandoned Material [ ] Fixed Facility  Name: Address:  City: Zip Code: (aparty)  [ ] Other (specify) Ourfil funt from system famous from 70,000
6.	ESTIMATED QUANTITY DISCHARGED: 500 Sol QUANTITY THREATENED TO BE RELEASED: problem rechard
7.	HATURE OF MATERIAL:  [ ] Solid [X] Liquid [ ] Gas [ ] Powder ppb [ ] Granular  [ ] Radioactive [ ] Other 13.0 TVH  Chemical Name: water contains full hydrocombons 150 ppb benzenc
	Chemical Name: water confouning full hydr Common Name: 130 pt smerce
8	. HAZARDOUS PROPERTIES: [ ] Corrosive [ ] Ignitable [<] Toxic [ ] Reactive [ ] Other
9	. HAZARDOUS MATERIAL WAS RELEASED TO:  [ ] Air [ ] Storm Drain [ ] San Francisco Bay [ ] Sanitary Sewer [ ] Other Natural Waterway (creek, lake, reservoir)[ ] Groundwater [ ] Groundsurface (soil, road, etc.) [ ] Other (specify)
10	. WEATHER CONDITIONS: dry, smry
11	NUMBER OF INJURED PERSONS REQUIRING HOSPITALIZATION: NAMES AND ADDRESSES OF HOSPITALS UTILIZED:

PERSONS PRESENT AT HAME: Contractor	SCENE: AFFILIATION	PHONE NO.
RESPONSIBLE PARTY: NAME: ADDRESS:		PHONE NO.
	O (SAMPLES, PHOTOGRAPHS	5, ETC.)
. CLEAN-UP ACTIONS:	overfull problem in F	Saher Formh corrected
	es of Persons Doing CL	EAN-UP:
DESCRIPTION OF CL	EAN-UP ACTIONS:	
TIME INCIDENT CLOS	sed: 12:00 pm Sv	
. ELAPSED TIME:		O į
- This rowre	TO BE NOTIFIED: ause Substantial Injur dge Ongoing crimi charge Other	y to Public Health & Safe nal investigations
• [ ] DISCHARGE TO FACTORS DETERMINT POTENTIAL DISCHAR PUBLIC HEALTH OR	NG THAT THIS HAZARDOUS GE IS LIKELY TO CAUSE	WASTE DISCHARGE OR SUBSTANTIAL INJURY TO THE
. NOTIFICATION:		
Board of Super Health Officer Alameda County California Dep Reporting Agen	: / Press Room partment of Health Serv	ices
ployees of the Depa ution 25180.7, Heal	f this information on b artment of Environmenta tth & Safety Code. The upon the best availabl	agencies and officials, we half of all designated al Health, according to information submitted in the time
spector's Name:	P	Date:
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August 9, 1991 SCI 430.017

Mr. Hossian Kazemi San Francisco Regional Water Quality Control Board 2101 Webster Street, Room 500 Oakland, California 94612

Contaminated Groundwater Release 1330 Martin Luther King Jr. Way Oakland, California

Dear Mr. Kazemi:

The purpose of this letter is to document a release of contaminated groundwater from the treatment plant located at the referenced address. The treatment plant is owned by the Oakland Redevelopment Agency and is being operated by Subsurface Consultants, Inc. (SCI). Gasoline contaminated groundwater is being (1) pumped from beneath the site, (2) temporarily stored in a 21,000 gallon above ground storage tank, and (3) subsequently treated using granular activated carbon. The water is then discharged under permit into the EBMUD sanitary sewer. Our work is being performed in coordination with the Alameda County Health Care Services Agency (ACHCSA).

On July 21, 1991, approximately 500 gallons of water was released onto the groundsurface as a result of over-topping of the storage tank. The tank over-topping occurred as a result of the failure of the level controls. The level controls had inadvertently been manipulated by a subcontractor resulting in gasoline contaminated groundwater being discharged at a rate of 3 gallons per minute (gpm) onto the groundsurface for approximately 2 to 2 1/2 hours. The contractor was in the process of installing new plumbing and level controls.

The release was discovered on Sunday afternoon by the contractor (HSR. Inc.) who then shut off the power supply to the groundwater pump. According to the contractor, no water flowed off-site but rather seeped into the soils around the tank. A letter from HSR, Inc. is attached confirming this observation. SCI observed the release area on Sunday evening and observed no indications that the water flowed off-site. The release area is shown on the attached Site Plan (Plate 1). Our estimates of the quantity of water that

## Subsurface Consultants, Inc.

Mr. Hossian Kazemi San Francisco Regional Water Quality Control Board SCI 430.017 August 9, 1991 Page 2

was released are based on our observations of the wetted soil in the area of the release, and calculations of the flow rate and the available freeboard in the tank that was measured on Saturday, July 20, 1991.

The water released was from the primary holding tank of the treatment facility and hence, may have contained low levels of petroleum hydrocarbons. Recent analysis of the groundwater being pumped into the tank (influent) indicated the following concentrations of hydrocarbons.

Table 1.
Contaminant Concentrations in Influent Water

Sample	Sampling Date	TVH <sup>1</sup> (ug/L) <sup>3</sup>	Benzene <sup>2</sup> (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
$WI^4 - 30 - 2$	07/23/91	1300	1.70	71	22	100

TVH = Total volatile hydrocarbons, EPA 8015 mod./5030

The actual concentrations of hydrocarbons in the released water are uncertain because average concentrations in the tank are substantially less than the influent. Previous analytical tests have indicated that effluent from the tank contains no detectable concentrations of hydrocarbons. Biodegradation is occurring within the closed top tank.

The ACHCSA and the Regional Water Quality Control Board (RWQCB) were notified of the release on Monday, July 22, 1991. On Wednesday, July 24, 1991, Mr. Paul Smith of the ACHCSA met with SCI at the site. During the visit SCI obtained 2 samples of the soil in the release area. Mr. Smith observed the sampling locations. The samples were obtained using hand sampling equipment. One soil sample was obtained from 6 to 12 inches beneath the groundsurface and another from 2 to 2 1/2 feet beneath the groundsurface. Both samples appeared wet indicating that the release had seeped deeper than 2 1/2 feet below the groundsurface. The samples were retained in brass liners. The ends of the sample liners were covered with

BTEX, analyses by EPA 8020/5030

ug/L = micrograms per liter or parts per billion (ppb)

WI = Well influent, i.e. wastewater from well prior to discharge into the primary holding tank

Mr. Hossian Kazemi San Francisco Regional Water Quality Control Board SCI 430.017 August 9, 1991 Page 3

Teflon sheets before capping, sealing with plastic tape and Both samples were refrigerated on-site and transported to the analytical laboratory with a chain-of-custody record. Analytical testing was performed by Curtis & Tompkins, Ltd., a State of California Department of Health Services (DHS) certified The samples were analyzed for total analytical laboratory. hydrocarbons, as gasoline, using EPA method 8015 modified/5030 and for benzene, toluene, ethylbenzene and xylene, (BTEX) using EPA method 8020/5030. The analytical test results are presented below. Analytical test reports are attached.

Table 2. Contaminant Concentrations in Soil

Sample	Sampling Date	TVH <sup>1</sup> (mg/kg) <sup>3</sup>	Benzene (vg/kg) <sup>4</sup>	Ethyl Toluene (ug/kg)	Total Benzene (ug/kg)	Xylenes (ug/kg)
TOF-1 @ 6"	7/24/91	ND <sup>5</sup>	ND	ND	ND	ND
TOF-1 @ 24"	7/24/91	ND	ND	ND	ND	ND

TVH = total volatile hydrocarbons, EPA 8015 mod./5030

#### Conclusions

test results indicate that analytical no concentrations of petroleum hydrocarbons are present in the soil in the area of the release. In our opinion, the release of water has not created any condition worthy of remediation or further study. The groundwater treatment system has been repaired and precautions have been implemented to prevent future overtopping problems.

BTEX, analyses by EPA 8020/5030

<sup>3</sup> 

mg/kg = milligrams per kilogram or parts per million (ppm)
ug/kg = micrograms per kilogram or parts per billion (ppb)
ND = None detected, chemicals not present at concentrations above detection limits, see test reports for detection limits.

Mr. Hossian Kazemi San Francisco Regional Water Quality Control Board SCI 430.017 August 9, 1991 Page 4

If you have any questions or require further documentation of the event, please call.

Yours very truly,

Subsurface Consultants, Inc.

James P. Bowers

deotechnical Engineer 157 (expires 3/31/95)

SOC: JPB: sld

Plate 1 - Site Plan Attachments:

Analytical Test Reports Chain-of-Custody Documents HSR Letter Dated July 26, 1991

cc: /Mr. Paul Smith, ACHCSA Ms. Lois Parr, Oakland Redevelopment Agency

Mr. John Esposito, Bramalea Pacific Mr. Matt Sherrill, Bramalea Pacific Mr. Donnell Choy, City of Oakland



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

2323 Fifth Street, Berkeley, CA 94710, Phone (415) 485-0900

DATE RECEIVED: 07/24/91 DATE REPORTED: 07/25/91

LAB NUMBER: 104592

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.017

LOCATION: MLK

RESULTS: SEE ATTACHED

QA/QC Approval

Final Appr

Los Angeles



DATE RECEIVED: 07/24/91 LABORATORY NUMBER: 104592 CLIENT: SUBSURFACE CONSULTANTS DATE ANALYZED: 07/24/91 DATE REPORTED: 07/25/91

PROJECT ID: 430.017

LOCATION: MLK

Total Volatile Hydrocarbons with BTXE in Soils and Wastes TVH by California DOHS Method/LUFT Manual October 1989 BTXE by EPA 5030/8020

LAB ID	SAMPLE ID	TVH AS GASOLINE (mg/Kg)		TOLUENE (ug/Kg)		TOTAL XYLENES (ug/Kg)
104592-1	TOF - 1 @ 6"	ND(1.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)
104592-2	TOF - 1 @ 24"	ND(1,0)	ND(5.0)	ND(5.0)	ND(5,0)	ND(5.0)

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

## QA/QC SUMMARY

RPD, % 6 RECOVERY, % 94 

# Subsurface Consultants

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name:	: MLK					
SCI Job Numbe	er:	430,018	i de			
Project Conta	act at SC	I: <u>Sean</u>	Carson			
Sampled By:	Charl	es Pear	50 m			
Analytical L						
Analytical T	urnaround	: <u>Rap</u>	id -241	^K		
Sample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling	Hold	Analysis	Analytical Method
TOF-106"	5	Τ	7-2-1-91		TUH + BTXE	8515/8020
TOF-10 24"		T	7-24-91		TVH + BTXE	8015/8020
		<del></del>				
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*	*	*	*		* *	
Released by:	Challeffer					7-67-11
Released by:		<u></u>	ived by:		Date:	125 91
Received by Laboratory: New Jan 1					Date:	- <del>11-11-1</del>
Released by		<del></del> .			Date: _	
Released by:	4.00				Date: _	

## NOTES TO LABORATORY:

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

Sample Type: W = Water, S = Soil, O = Other (specify)

Container Type: V = VOA, P = Plastic, G = Glass, T = Brass Tube, O = Other (specify)

3851 Charter Park Drive, Suite A • San Jose, California 95136 • Phone 408-265-4300 Fax 408-265-1664

July 26, 1991

Mr. Jim Bowers Subsurface Consultants, Inc. 171 12th St., Suite 201 Oakland, CA 94607

Dear Jim:

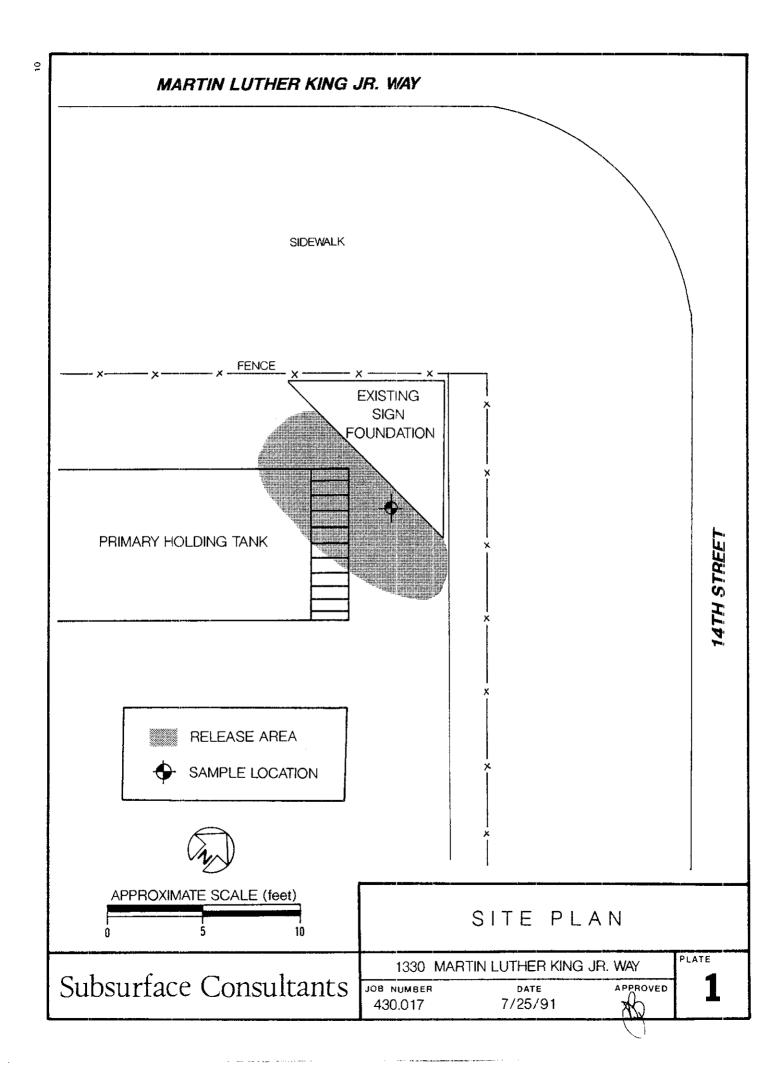
On Sunday, July 21, 1991 I witnessed the overflow of water from the water treatment facility located at the intersection of 14th and Martin Luther King Jr. Way in Oakland. At the time of my arrival at approximately 12:30 P.M., very little water had escaped from the treatment system storage tank. No water encreached upon the sidowalk, gutter, or storm drains in the area.

In order to stop the flow of water, I tripped the circuit breaker that governed the downwell pump which was delivering water to the storage tank.

If you have any questions regarding this matter, please do not hesitate to contact me at (408) 265-4300.

Graciously,

Denny McIlvaine Project Manager



July 10, 1991 SCI 430.010

91 July 11 Fil 2: 33

Mr. William Meckel East Bay Municipal Utility District Wastewater Department - MS59 P.O. Box 24055 Oakland, California

Quarterly Monitoring Report #5 (April 10 thru July 10, 1991) Wastewater Discharge Permit #001-00009 1330 Martin Luther King Jr. Way Oakland, California

Dear Mr. Meckel:

This letter presents quarterly monitoring results from a groundwater treatment plant at 1330 Martin Luther King Jr. Way. Monitoring of treated effluent has been performed in accordance with criteria specified in the EBMUD wastewater discharge permit #001-00009, issued to the Oakland Redevelopment Agency for remediation of hydrocarbon contaminated groundwater.

During the fifth quarter of operation (April 10, 1991 through July 10, 1991) approximately 527,670 gallons of treated water were discharged into the EBMUD sanitary sewer system. Treatment plant performance remains excellent. The analytical results from 29 sampling events indicate that total volatile hydrocarbons (TVH), benzene, toluene, xylene, and ethylbenzene (BTXE) have been reduced to nondetectable concentrations before discharge into the EBMUD sanitary sewer. No indications of breakthrough have occurred in the primary carbon column. Results of the water quality data generated during the fifth quarter are presented in Table 1. Analytical test reports and Chain-of-Custody documents are also attached.

Extraction Well #1 (EW-1) has not been operating during the fifth quarter. Extraction Well #2 (EW-2) has been pumping approximately 4 gallons per minute (gpm) during the fifth quarter.

The analytical test results indicate that biological activity within the primary holding tank, which was documented in previous quarterly reports, is on-going. Hydrocarbon concentrations of up to approximately 6200 parts per billion (ppb) are entering the primary holding tank and not more than 1.7 ppb of hydrocarbons have

## Subsurface Consultants, Inc.

Mr. William Meckel East Bay Municipal Utility District SCI 430.010 July 10, 1991 Page 2

been recorded leaving the tank before passing through the carbon treatment system. Consequently, hydrocarbon loading of the carbon treatment system has been minimal.

If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.

Sean O. Carson

Civil Engineer 45074 (expires 3/31/94)

SOC: JPB: ddh

Attachments:

Table 1 - Contaminant Concentrations in Water

Analytical Test Reports Chain-of-Custody Documents

cc:

Mr. John Esposito Bramalea Pacific

Ms. Lois Parr

Oakland Redevelopment Agency, OEDE

Mr. Paul Smith

**ACHCSA** 

Mr. Lester Feldman

RWQCB

Mr. Donnell Choy City of Oakland

Mr. Roy Ikeda

Crosby, Heafey, Roach and May

Table 1. Contaminant Concentrations In Water

Sample	Sampling Date	TVH <sup>1</sup> (ug/L) <sup>3</sup>	Benzene² _(ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
$WI^{4}-26-2^{5}$ $I^{6}-26$ $B^{8}-26$ $E^{9}-26$	04/10/91	3400 ND <sup>7</sup> ND ND	450 ND ND ND	260 ND ND ND	38 ND ND ND	310 1.7 ND ND
WI-27-2	04/24/91	2900	310	180	23	330
I-27		ND	ND	ND	ND	ND
B-27		ND	ND	ND	ND	ND
E-27		ND	ND	ND	ND	ND
WI-28-2	05/24/91	6200	580	380	79	420
I-28		NR <sup>10</sup>	ND	ND	ND	ND
B-28		NR	ND	ND	ND	ND
E-28		NR	ND	ND	ND	ND
WI-29-2	06/24/91	1300	150	56	22	92
I-29		NR	ND	ND	ND	ND
B-29		NR	ND	ND	ND	ND
E-29		NR	ND	ND	ND	ND

TVH = Total volatile hydrocarbons, EPA 8015/5030

<sup>&</sup>lt;sup>2</sup> BTEX, Analyses by EPA 8020/5030

ug/L = micrograms per liter or parts per billion (ppb)

WI = Well Influent, i.e. wastewater from well prior to discharge into the primary holding tank

<sup>5 -2</sup> indicates sample from Extraction Well #2

I = Influent at primary carbon vessel

ND = None detected, chemicals not present at concentrations above the detection limits; see test reports for detection limits

<sup>8</sup> B = Between carbon vessels

<sup>9</sup> E = Effluent

NR = Test not requested

## RECEIVED



APR 22 1991 Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878
2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 04/10/91 DATE REPORTED: 04/16/91

LAB NUMBER: 103501

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: FOUR WATER SAMPLES

PROJECT ID: 430.010

LOCATION: MLK EXTRATION

RESULTS: SEE ATTACHED

QA/QC Approval

Los Angeles



CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK EXTRACTION

DATE RECEIVED: 04/10/91 DATE ANALYZED: 04/11/91

DATE REPORTED: 04/16/91

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	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
103501-1	WI - 26 - 2	3,400	450	260	38	310
103501-2	I - 26	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	1.7
103501-3	B - 26	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103501-4	E - 26	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

<1 RPD, % 101RECOVERY, % 

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

LAB NUMBER: 103626

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK EXTRACTION

RESULTS: SEE ATTACHED

QA/QC Approval

Fina

Los Angeles

Wilmington



CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK EXTRACTION

DATE RECEIVED: 04/24/91

DATE ANALYZED: 04/26/91

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)
103626-1	WI - 27 - 2	2,900	310	180	23	330
103626-2	I - 27	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103626-3	B - 27	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103626-4	E - 27	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

DATE RECEIVED: 05/28/91 DATE REPORTED: 06/04/91

LAB NUMBER: 103929

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK GW EXTRACTION

RESULTS: SEE ATTACHED

OA/OC Approval

Final Apphovab

Berkeley Wilmington Los Angeles



CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK GW EXTRACTION

DATE RECEIVED: 05/28/91
DATE ANALYZED: 05/31/91
DATE REPORTED: 06/04/91

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020 Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT	ΙĐ	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES	REPORTING LIMIT *
			(ug/L)	(ug/L)	(ug/L)	(ug/L)	( u g / L )
103929-2	I - 28		ND	ND	ND	ND	0.5
103929-3	B - 28		ND	ND	ND	ND	0.5
103929-4	E - 28		ND	ND	ND	ND	0.5

ND = Not detected at or above reporting limit.

<sup>\*</sup> Reporting Limit applies to all analytes.

OA	/QC	SUMMARY	7
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RPD, %

RECOVERY, %

112

.... .. .. .. ......



CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK GW EXTRACTION

DATE RECEIVED: 05/28/91
DATE ANALYZED: 05/31/91

DATE REPORTED: 06/04/91

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	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES
				(ug/L)	•	_
103929-1	WI - 28 - 2	6.200	580	380	79	420

QA/QC SUMMARY

RPD, %

RECOVERY, %



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

2323 Fifth Street, Berkeley, CA 9471O, Phone (415) 486-0900

DATE RECEIVED: 06/25/91 DATE REPORTED: 06/28/91

LAB NUMBER: 104273

CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK GW EXTRACTION

RESULTS: SEE ATTACHED

QA/QC Approval

Los Angeles



CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK GW EXTRACTION

DATE RECEIVED: 06/25/91

DATE ANALYZED: 06/28/91

DATE REPORTED: 06/28/91

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	BENZENE	TOLUENE		TOTAL XYLENES
		(ug/L)	. •	(ug/L)		•
104273-1	WI - 29 - 2	1,300	150	5 6	22	92

QA/QC SUMMARY

RPD, %
RECOVERY, %
103



CLIENT: SUBSURFACE CONSULTANTS PROJECT ID: 430.010

LOCATION: MLK GW EXTRACTION

DATE RECEIVED: 06/25/91 DATE ANALYZED: 06/27/91

DATE REPORTED: 06/28/91

Benzene, Toluene, Ethyl Benzene, Xylenes by EPA 8020 Extraction by EPA 5030 Purge and Trap

LAB ID	CLIENT	I D	BENZENE	TOLUENE	ETHYL BENZENE	TOTAL XYLENES	REPORTING LIMIT *
			( u g / L )	( u g / L )	(ug/L)	(ug/L)	( u g / L )
104273-2	I - 29		ND	ND	ND	NĐ	0.5
104273-3	B - 29		ND	ND	ND	ND	0.5
104273-4	E - 29		ND	ND	ND	ND	0.5

ND = Not detected at or above reporting limit.

<sup>\*</sup> Reporting Limit applies to all analytes.

OA.	/QC	SUMMARY	r

Z, Z						
RPD, %	1					
RECOVERY, %	103					

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Nam	ıe:	MLK	GW E	<del>\</del>		
SCI Job Num	nber:	۷	130.0	10		
Project Con	ntact at S	CI:	Sean	Cars	<u>son</u>	
Sampled By:			Ferna	end o	Velez	
Analytical Laboratory: Curtis + Tompkins Ltd.						
Analytical	Turnaroun	d:		Norm	nal	
Sample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling Date	Hold	Analysis	Analytical Method
WI-26-2	<u> </u>	V×Z	4/10/91		TVH/BTX2	=
I-26	$\overline{\mathcal{W}}$	V.Z	4/10/91		IVH/BIXE	
B-26	<u>~~</u> _	V.Z	4/10/91		TVH/BTXE	
E-26	<u>u</u> _	V.2	4.0[9]	·	IVH/BIXI	
					-	
				<del></del>		-
					4 ram	
	<u></u>			·		
		****				<del></del>
					47-0-1	<del></del>
9	k	* *	*		* *	
Released by		Alece:	ived by:		Date: _	4/10/9/
Released by	7:	Rece	ived by:		Date:	
Received by	y Laborato	ory: Goam	wheat.		Date: _	1/10/91
Released by	y Laborato	ory:			Date: _	
Released by	A:				Date: _	

#### NOTES TO LABORATORY:

- Notify SCI if there are any anomalous peaks on GC or other scans

- Questions/clarifications - Contact SCI at (415) 268-0461

Sample Type: W = Water, S = Soil, O = Other (specify)

Container Type: V = VOA, P = Plastic, G = Glass, T = Brass Tube, O = Other (specify)

#### CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name: MLK	GW Extracts	· • • • • • • • • • • • • • • • • • • •
SCI Job Number:	430,010	
Project Contact at SCI:	Sean Cano	У
Sampled By:	Sean Carso	<u>س</u>
Analytical Laboratory:	C+T	
Analytical Turnaround:	Normal	
Sample Container  Sample ID Type <sup>1</sup> Type <sup>2</sup>	Sampling Date Hold	Analytical Analysis Method
WI-27-2 W VxZ	4/24/91	TVH/BIXE
I-27 W VxZ	4/24/91	TVH/ISTXR
B-27 W V.Z	4/24/91	TVH/BIXE
E-27 W V.Z	4/24/91	TVH/BIXE
	<del></del>	And the state of t
	* *	* *
Released by: And Rece	eived by:	Date: <u>04/24/9/</u>
Released by: Rece	eived by:	Date:
Received by Laboratory:	the Bone	Date: 7/27/9/
Released by Laboratory:		Date:
Released by:		Date:

#### NOTES TO LABORATORY:

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

Sample Type: W = Water, S = Soil, C = Other (specify) Container Type: V = VOA, P = Plastic, G = Glass, T = Brass Tube, 0 = Other (specify)

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name	*		MLK 1	GW.	Extract	400
SCI Job Numb	er:		430.0	210		
Project Cont	act at SCI:			,		
Sampled By:		· · · · · · · · · · · · · · · · · · ·	Fer	nend	o Velez	2
Analytical I	aboratory:		<u> </u>	vtis +	Tompk	INS
Analytical T	urnaround:			No	rmal	
Sample ID WI-28-Z	Sample Co	ntainer Type <sup>2</sup> Vx <b>3</b>	Sampling Date 5/24/9/	Hold	Analysis TVH/B	Analytical Method
<u>I-28</u>	<u>~</u> _	V×2	5/24/91		BIXE	
B-28	<u>~~</u>	V.2	5/24/91		BIXE	
E-28	<u> </u>	V × Z	5/24/91		BIXE	
			<del> </del>	<del></del>		
			<del></del>			· .
			<del></del>		<del></del>	_
*	<del>*</del>	*	*		*	*
Released by:	Lain /2/	Recei	ved by:		Date:	05/28/91.
Released by:	1	Recei	ved by:		Date:	
Received by	Laboratory:	T	1	<u></u>	Date:	5/28/21 0845
Released by	Laboratory:	7		-·	Date:	
Released by:					Date:	
THE STATE OF THE S		<del></del>				

#### NOTES TO LABORATORY:

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

Sample Type: W = Water, S = Soil, O = Other (specify)
Container Type: V = VOA, P = Plastic, G = Glass, T = Brass Tube, 0 = Other (specify)

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name	e:	MLV	< 610	Exct	raction	
SCI Job Numl	per:		430,0	010_		····
Project Con-	tact at SC	I:	Sea	η Ca	~20~	
Sampled By:			See	<u>. C:</u>		
Analytical 1	Laboratory	:			Tompkin	
Analytical '	Turnaround			Dar	•	
Sample ID	Sample Type <sup>1</sup>	Container Type <sup>2</sup>	Sampling Date	Hold	Analysis	Analytical Method
WI- Z9-Z	<u>\\</u>	V * 3	6/24/91	<del></del>	TVH/BT>	Œ
I-29	<u> </u>	V.2	6/24/91		BIXE	<u> </u>
B-29	$\underline{W}$	<u> </u>	6/24/91		BIXE	
E-29	$\overline{\omega}$	V×Z_	6/24/91		BIXE	
				<del></del>	<u>.                                    </u>	
					<del></del>	
		·				***
						***************************************
*	*	*	*		* 5	
Released by:	Cilebano		ved by:		Date: _	6/25/91
Released by:	·	Recei	ved by:		Date: _	,
Received by	Laborator	y: Joans	re Death		Date: _	P/25/91
Released by	Laborator	y: <u>//</u>		····	Date: _	
Released by:		- · · · · · · · · · · · · · · · · · · ·			Date: _	
1 0	Y.T.	····	a 12 a a			

#### NOTES TO LABORATORY:

- Notify SCI if there are any anomalous peaks on GC or other scans

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- Questions/clarifications - Contact SCI at (415) 268-0461

Sample Type: W = Water, S = Soil, O = Other (specify)
Container Type: V = VOA, P = Plastic, G = Glass, T = Brass Tube, 0 = Other (specify)

91 JUNIO 2011: 23

June 18, 1991 SCI 430.015

Mr. William Meckel East Bay Municipal Utility District Wastewater Department MS 59 P.O. Box 24055 Oakland, California 94623

Garage 2 Site Source Addition
Wastewater Discharge
1330 Martin Luther King Jr. Way
Oakland, California

Dear Mr. Meckel:

This letter serves to notify you of our intent to treat and discharge groundwater from an additional source at the referenced facility. The treated water will be discharged into the East Bay Municipal Utility District (EBMUD) sanitary sewer under permit number 001-0009. The contaminated water resulted from a leaking underground gasoline tank.

The new source of contaminated groundwater will be from temporary dewatering during construction of the City of Oakland Garage 2 project. The contaminated water exists near the corner of 12th Street and Martin Luther King Jr. Way in Oakland. Approximately 3000 gallons of water from this location was treated and discharged under the existing permit in September, 1990 and documented in a letter to you dated September 24, 1990.

A summary of the analytical test results performed on the contaminated groundwater is presented in Table 1. The water samples were obtained from pits excavated within the contaminated area.

### Subsurface Consultants, Inc.

Mr. William Meckel East Bay Municipal Utility District Wastewater Department SCI 430.015 June 18, 1991 Page 2

Table 1
Contaminant Concentrations in Groundwater
From the Garage 2 Site

Sample	$\frac{\mathtt{TPH}^1}{(\mathtt{mg/L})^3}$	Benzene (ug/L) <sup>4</sup>	Toluene (ug/L)1	Xylene (ug/L)1	Benzene	VOCs <sup>2</sup>	Chlord form (ug/L) <sup>3</sup>	PCE5
GW-1	0.140	0.7	5.4	57	2.9	ND	3.1	5.5
GW-2	0.840	8	100	430	46	ND	4.0	9.9

<sup>1</sup> TPH = Total Petroleum Hydrocarbons, EPA 8015/5030

Additionally, trace levels of several heavy metals were detected in the water samples. The results are indicated on the attached analytical test reports.

The treatment plant performance has been excellent to date. The analytical results from 27 sampling events, indicate that organic compounds are being adsorbed by the granular activated carbon (GAC) and no detectable concentrations of hydrocarbons are being discharged into the EBMUD sanitary sewer system.

We anticipate that groundwater will be extracted from the Garage 2 site for several months at a maximum rate of approximately 15,000 gallons per day. The concentrations of contaminants in the water from the Garage 2 site are substantially less than that currently being treated by the system. Consequently, we conclude that the discharge should have little or no effect on system performance.

We propose to continue monitoring treatment plant performance in accordance with our existing approved monitoring program. However, we will additionally analyze the treated water for volatile organic compounds (EPA 8010) to monitor the removal of tetrachloroethene (PCE). A flow meter will be installed on the Garage 2 discharge line so that volumes can be accurately measured and reported to you.

VOCs = Volatile Organic Compounds, EPA 8010/5030

mg/L = milligrams per liter or parts per million (ppm)

ug/L = micrograms per liter or parts per billion (ppb)

<sup>5</sup> PCE = tetrachloroethene

Mr. William Meckel East Bay Municipal Utility District Wastewater Department SCI 430.015 June 18, 1991 Page 3

If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.

Sean O. Carson

Civil Engineer 45074 (expires 3/31/94)

Attachments: Analytical Test Reports

1 copy: Mr. John Esposito

Bramalea Pacific

1221 Broadway, Suite 1800 Oakland, California 94621

1 copy: Ms. Lois Parr

City of Oakland - OEDE 1333 Broadway, Suite 900 Oakland, California 94612

1 copy: Mr. Paul Smith

Alameda County Health Care Services Agency

80 Swan Way, Suite 200 Oakland, California 94621

1 copy: Mr. Lester Feldman

California Regional Water Quality Control Board

1800 Harrison Street, Suite 700

Oakland, California 94612

1 copy: Mr. Donnell Choy

City of Oakland

505 14th Street, 12th Floor Oakland, California 94612

1 copy: Mr. Roy Ikeda

Crosby, Heafey, Roach and May

1999 Harrison Street

Oakland, California 94612

SOC: JPB: sld

### CAH 17 TOTAL HETALE ARALYSIS

PROJECT NAME: BRANGLEA PACIFIC

PROJECT NUMBER: 9000028A PROJECT HANACER: GEORGE FORD COCH: 900197
CONC UNITS: Mg/L
METHOD: 6010 1 7000
MATRIX: WATER

UCC LAR ID: SAMPLE 10: DATE AMALYZED	METHOO BLANK 9-19+90	900197-01-05 GW1 9-19-90	900197-02-05 GW2 9-19-90	DETECTION TIMIT	STLC LIMITS (mg/L)	TTLC LIMITS (mg/kg)
ANTIMONY ARSENIC BARIUM BERYLLIUM CADMIUM CHRCMIUM COSALT COPPER LEAG* MERGURY HOLYBOENUM* HICKEL* SELENIUM* VANADIUM* ZING	OK OK OH OH OH OH OH OH OH OH OH OH OH OH	0.09	NO 0.04 NO 0.16	6.05 0.001 0.05 0.007 0.02 0.02 0.05 0.01 0.05 0.002 0.03 0.05 0.005 0.005	15 3.0 100 0.75 1.0 569 80 25 5.0 0.2 350 20 1.0 5 7.0 24 250	500 500 10000 75 100 2500 8000 2500 1000 20 3500 2000 100 500 700 2406 5000

. . ANALYTED BY ETC SANTA ROSA

#### Woodward-Clyde Consultants

BENZENE, TOLUENE, ETHYLBENZENE, XYLENES DATA SHEET

C::FHT: BRAMELEA PACIFIC PROJECT: 90C002BA PROJ.MCR.: GEORGIE FORD DATE RECEIVED: 09-17-90 METHO ID: 8020 UNITE: ug/L

UCC LAB ID:		900197+01-02 qui	900197-02-02 GH2
SAMPLE ID LINE 2: DATE SAMPLED: DATE ANALYZED! DETECTION LINIT:	09-17-90	09-17-90 09-17-90 0,5	09-17-90 09-17-90 5
SENZENE TOLUENE ETHYLBENZENE XYLENES	0H 0H 0H 0H	0.7 5.4 2.9 57	- 110 4 <u>6</u> 430

QUALITY ASSURANCE INFORMATION

AVG REC #1	AVG REC 1/2	AVG RPO
********	*****	• • • • • • •
82	85	4

HD - NOT DETECTED: SAMPLE CONTAINED THE PARAMETER SELOW THE PRACTICAL QUANTITATION LIMIT.

### Woodward-Clyde Consultants

#### YCLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT: BRAMELEA PACIFIC A8500000 :TDBUDRG ORDR BDROED :XRM.LURG DATE RECEIVED: 09-17-90 METHOD 10: 602

UNITS: ug/L

WCC LAS ID:	METHOD	900197-01-01	900197-02-01
SAMPLE TO LINE T:	BLANK	<b>⊈₩1</b>	GW2
SAMPLE ID LINE 2:			
DATE SAMPLED:		09-17-90	69-17-90
DATE ANALYZED:	<b>09-17-9</b> 0	Q <del>9</del> •17-90	09-17-90
DETECTION LIMITE	0.5	ā.3	a.s
			***********
SENZENE	NO	0.7	. 8
-TOLUENE	ЮK	5.4	110
CHLOROBENZEHE	סא	NO	NO
ETHYLDENZENE	מא	2.9	46
1,3-01CHLCROBENZENE	หต	סא	OM
1,7 DICHLOROBENZERE	NO	NO	DK
1,4-01CHCOROBENZENE	HO	םג	NO

#### QUALITY ASSURANCE INFORMATION

AVG REC #1	AVG REC #2	AVG RPO
********	****	******
82	85	4

NO - NOT DETECTED: SAMPLE CONTAINED THE PARAMETER BELOW THE PRACTICAL QUANTITATION LIMIT.

## TOTAL PETROLEUM HYDROCARSONS HODIFIED EPA METHOD 8015

PROJECT NAME: BRAMALEA PACIFIC

PROJECT NUMBER: 9000028A PROJECT NAMAGER: GEORGE FORD CDC# 900197

was:		KIRTAH	KOLLECTION EXES	EXTRACTION DATE		erection Linit (Ve/L)	7≱H {ug/L}
HETHOD BLANK 900197 01-02 900197-02-02	SAMPLE ID GW1 GW2	WATER WATER WATER	09-17-90 09-17-90	09-17-90 09-17-90 69-17-90	09-17-90 09-17-90 09-17-90	50	ри 047 048

quantitated as Leeded Gascline.

REVIEWED BY:

## Woodward-Clyde Consultants

#### VOLATILE CREATER ANALYSIS DATA SHEET

CLIENT: BRAMELEA PACIFIC

PROJECT: 90CG028A PROJECT: GEORGE FORG DATE RECEIVED: 09-17-90

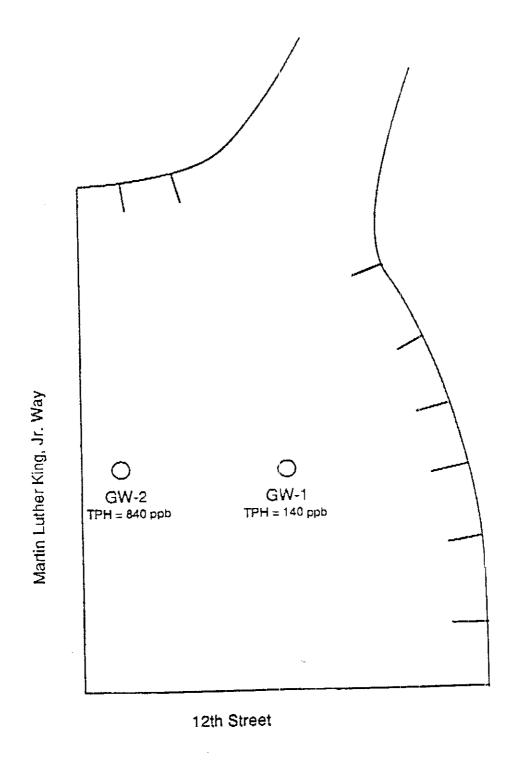
DETHOD ID: 8010 JVDP :BTINU

WCC LAB ID:	NETHOD	900197-01-01	900197-02-01
SAMPLE ID LINE 1:	BLANK	gu1	GH2
SAMPLE TO LINE 2:			
DATE SAMPLED:		09-17-90	09-17- <del>90</del>
DATE AHALYZED:	09-17-90	09-17-90	09-17-90
DETECTION LIMIT:	0.5	0.5	0.5
SHOMOOTCHLORCHETHANE	юĸ	סא	сы
BROMOFORM	NO	OK	HÒ
BRONOMETHANE	. NO	NO	ON
CARRON TETRACHLORIDE	ND	םע	КФ
- Chlorobenzene	ND	NO	, ND
CHLOROETHANE	ИĎ	DK	ND
2-CHLOROSTHYLVINYL STHER	l ko	HD	NO
CHLOROFORH	NO	3.1	40
SHAHTSMORDJKS	ХO	но	ND
0:BRCMOCHLORCMETHANE	סא	D	NO
· 1,2-01CHLOROBENZEHE	MO	OΚ	HD
1,3-DICHLOROBENZENE	но	NO	NO
11.4-0[CHLOROBENZENE	סא	NO	; ND
OICHLORODIFLUOROMETHANE	סא	םא	AID
1,1-01CHLOROETHANE	ND	מא	XO.
1,2-01CHLOROETHANE	ND	NO	ND
1,1-01CHLOROETHENE	ND	ОЖ	NO.
TRANS-1,2-DICHLORGETHENE	. QN	ND	NO NO
1,2-01CHLOROPROPANE	מא	NO	ОК
CIE-1,3-DICHLOROPROPENE	מא	KO	DK CK
TRANS-1,3-DICHLORGEROPEN	E HO	סג	NO
HETHYLENE CHLORIDE	סא	מא	CH
1,1,2,2-TETRACHLORGETHAN	e no		ND.
TETRACHLOROETHENE	NO	5.5	9.9
1,1,1-TRICHLOROETHANE	HD	NO	םא
1,1,2-TRICHLORGETHANE	ND	NO	HD
IN I CHLOROE I WENE	NO	סג	OK
FRICHLOROFLUORCMETRANE	מא	NC	DN
LINAT CHFOX105	NO	HO	סא

<b>QUALITY</b>	ASSURANCE	INFORMATION	
_			

AVO REC #1	AVO REC #2	AVG RPO
	**	
100	114	12-

NO . NOT DETECTED: SAMPLE CONTAINED THE PARAMETER SELOW THE PRACTICAL QUANTITATION LIMIT.

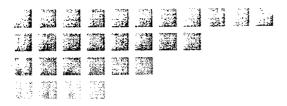


Note: not to scale

Legend:

C Location of water sample

	Project No.	City Center Garage II	Water Sampling Locations	
	90C0028A		Base of Excavation	-
Woodward-Clyde Consultants				



91 400 12 70 9:55

April 10, 1991 SCI 430.010

Mr. William Meckel East Bay Municipal Utility District Wastewater Department - MS59 P.O. Box 24055 Oakland, California

Quarterly Monitoring Report #4
Wastewater Discharge Permit #001-00009
1330 Martin Luther King Jr. Way
Oakland, California 9467

Dear Mr. Meckel:

This letter presents quarterly monitoring results from a groundwater treatment plant at 1330 Martin Luther King Jr. Way. Monitoring of treated effluent has been performed in accordance with criteria specified in the EBMUD wastewater discharge permit #001-00009, issued to the Oakland Redevelopment Agency for remediation of hydrocarbon contaminated groundwater.

During the fourth quarter of operation (January 10, 1991 through April 9, 1991) approximately 333,620 gallons of treated water were discharged into the EBMUD sanitary sewer system. Treatment plant performance remains excellent. The analytical results from 25 sampling events indicate that total volatile hydrocarbons (TVH), benzene, toluene, xylene, and ethylbenzene (BTXE) have been reduced to nondetectable concentrations before discharge into the EBMUD sanitary sewer. No indications of breakthrough have occurred in the primary carbon column. Results of the water quality data generated during the fourth quarter are presented in Table 1. Analytical test reports and Chain-of-Custody documents are also attached.

The groundwater pumping and treatment system were not operational between 12/12/90 and 2/13/91. Groundwater from 2 extraction wells was processed by the treatment system when pumping resumed on February 13, 1991. Extraction wells 1 and 2 (EW-1 and EW-2) pumped 2 gallons per minute (gpm) each until 3/18/91 when EW-2 was adjusted to 4 gpm. On 3/24/91 the pump from EW-1 ceased functioning and is presently not operational. EW-2 continues to extract approximately 4 gpm. EW-2 is approximately 45 feet east of EW-1 and is located within the same contaminant plume.

### Subsurface Consultants, Inc.

Mr. William Meckel East Bay Municipal Utility District SCI 430.010 April 10, 1991 Page 2

The analytical test results indicate that biological activity within the primary holding tank, which was documented in the second and third quarterly reports is on-going. Hydrocarbon concentrations of up to approximately 3600 parts per billion (ppb) are entering the primary holding tank and not more than 150 ppb of hydrocarbons are leaving the tank before passing through the carbon treatment system. Therefore, hydrocarbon loading of the carbon treatment system has been minimal.

If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.

Sean O. Carson

Civil Engineer 45074 (expires 3/31/94)

SOC: RWR: ddh

Attachments:

Table 1 - Contaminant Concentrations in Water

Analytical Test Reports Chain-of-Custody Documents

cc:

Mr. John Esposito Bramalea Pacific

Ms. Lois Parr

Oakland Redevelopment Agency, OEDE

√ Ms. Katherine Chesick ACHCSA

Mr. Lester Feldman RWOCB

Mr. Donnell Choy City of Oakland

Mr. Roy Ikeda

Crosby, Heafey, Roach and May

Table 1. Contaminant Concentrations In Water

Sample	Sampling Date	TVH <sup>1</sup> (ug/L) <sup>3</sup>	Benzene <sup>2</sup> (ug/L)	Toluene (ug/L)	Ethyl Benzene (ug/L)	Total Xylenes (ug/L)
$WI^4-23-1^5$	02/27/91	3600	830	430	24	310
$WI-23-2^6$		3200	460	350	70	440
$I^7-23$		150	0.7	2.4	ND <sup>8</sup>	25
$B^9-23$		ND	ND	ND	ND	ND
$E^{10}-23$		ND	ND	ND	ND	ND
WI-24-1	03/13/91	1300	410	49	1.6	120
WI-24-2		2000	360	120	25	270
I-24		ND	ND	ND	ND	ND
B-24		ND	ND	ND	ND	ND
E-24		ND	ND	ND	ND	ND
WI-25-2	03/28/91	2800	450	180	29	230
I-25		96	2.3	0.8	ND	0.5
B-25		ND	ND	ND	ND	ND
E-25		ND	ND	ND	ND	ND

TVH = Total volatile hydrocarbons, EPA 8015/5030

BTEX, Analyses by EPA 8020/5030

ug/L = micrograms per liter or parts per billion (ppb)

WI = Well Influent, i.e. wastewater from well prior to discharge into the primary holding tank

<sup>5 -1</sup> indicates sample from Extraction Well #1

<sup>6 -2</sup> indicates sample from Extraction Well #2

I = Influent at primary carbon vessel

ND = None detected, chemicals not present at concentrations above the detection limits; see test reports for detection limits

<sup>9</sup> B = Between carbon vessels

E = Effluent



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

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

71 7,5,9,2,4,0,1,9,5,1,5,6

DATE RECEIVED: 02/27/91 DATE REPORTED: 03/04/91

LAB NUMBER: 103104

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: FIVE WATER SAMPLES

PROJECT ID: 430.010

LOCATION: MLK GW EXTRACTION

RESULTS: SEE ATTACHED

OA/OC Approval

Final Aport

Los Angeles



CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK GW EXTRACTION

DATE RECEIVED: 02/27/91

DATE ANALYZED: 03/01/91

DATE REPORTED: 03/04/91

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)
103104-1	WI - 23 - 1	3,600	830	430	2 4	310
103104-2	WI - 23 - 2	3,200	460	350	7 0	440
103104-3	I - 23	150	0.7	2.4	ND(0.5)	25
103104-4	B - 23	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103104-5	E - 23	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)

 $\mbox{ND} = \mbox{Not detected at or above reporting limit; Reporting limit indicated in parentheses.}$ 

#### QA/QC SUMMARY

RPD, %	1				
RECOVERY, %	89				



# Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878 2323 Fifth Street, Berkeley, CA 94710, Phone (415) 486-0900

DATE RECEIVED: 03/13/91 DATE REPORTED: 03/19/91

LAB NUMBER: 103231

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: FIVE WATER SAMPLES

PROJECT ID: 430.010

LOCATION: MLK GW TREATMENT

RESULTS: SEE ATTACHED

Los Angeles



CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK GW TREATMENT

DATE RECEIVED: 03/13/91

DATE ANALYZED: 03/18/91

DATE REPORTED: 03/19/91

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	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
103231-1	WI - 24 - 1	1,300	410	49	1.6	120
103231-2	WI - 24 - 2	2,000	360	120	25	270
103231-3	I - 24	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103231-4	B - 24	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103231-5	E - 24	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, %	<1			
RECOVERY, %	8.3			
	========			



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

2323 Fifth Street, Berkeley, CA 9471O, Phone (415) 486-0900

DATE RECEIVED: 03/28/91 DATE REPORTED: 04/03/91

LAB NUMBER: 103379

CLIENT: SUBSURFACE CONSULTANTS

REPORT ON: 7 WATER SAMPLES

PROJECT ID: 430.010

LOCATION: MLK EXTRACTION

RESULTS: SEE ATTACHED

QA/QC Approval

Los Angeles

The state of the s



CLIENT: SUBSURFACE CONSULTANTS

PROJECT ID: 430.010

LOCATION: MLK EXTRACTION

DATE RECEIVED: 03/28/91 DATE ANALYZED: 03/29/91

DATE REPORTED: 04/03/91

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	TOLUENE (ug/L)	ETHYL BENZENE (ug/L)	TOTAL XYLENES (ug/L)
103379-1	MW · 29	500	ND(0.5)	1.6	ND(0.5)	0.8
103379-1	MW - 58	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103379-3	MV - 39	ND(50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103379-4	WI - 25 - 2	2,800	450	180	29	230
103379-5	1 - 25	96	2.3	0.8	ND(0.5)	0.5
103379-6	B - 25	ND (50)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)
103379-7	E - 25	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, %
RECOVERY, %
100

# Subsurface Consultants

#### CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name: MLK 6	W Extra	ction	
SCI Job Number: 43	0,00		
Project Contact at SCI:	Sean C	ecson	
Sampled By:	Fernand	lo Velez	
Analytical Laboratory:	Curts.	Tompkin	<u> </u>
Analytical Turnaround:	Norma		
Sample ID Type <sup>1</sup> Type <sup>2</sup>	ampling Date Hold	Analysis	Analytical Method
WI-23-1 W V2 Z	===91	TVH/BT)	E
WI-23-Z W V,Z		TVH/BTX	£
I-Z3 W V.Z		TVH/BT>	(Z
B-23 W V.Z		TVH/BTX	(E
E-23 W V.Z		TVH/BIX	EI
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Released by: This Buffeceived	d by:	Date:	2-27-91
Released by: Received	d by:	Date: _	
Received by Laboratory:	-whi	Date: _	2/27/91
Released by Laboratory:		Date: _	· · · · · · · · · · · · · · · · · · ·
Released by:		Date:	

#### NOTES TO LABORATORY:

Sample Type: W = Water, S = Soil, O = Other (specify)
Container Type: V = VOA, P = Plastic, G = Glass, T = Brass Tube, 0 = Other (specify)

<sup>-</sup> 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	<u>6W</u>	Treat	ment	
SCI Job Number:	430.0	10		
Project Contact at SCI:	Sean	Carse	on	· · · · · · · · · · · · · · · · · · ·
Sampled By:	Denna	s Al	exender	
Analytical Laboratory:	<u> </u>	~ \\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	-Tompki	is
Analytical Turnaround:		Norm	ia (	
Sample Container Sample ID Type <sup>1</sup> Type <sup>2</sup>	Sampling Date	Hold	Analysis	Analytical Method
WT-24-1 W V x Z	3/13/91	<del></del>	TVH/BT	XE
WI-24-2 W V > Z	3/13/91		IVH/BT>	(E
I-Z4 W V,Z	3/13/91		IVH/BT>	(E
B-24 W V X	3/13/91		TVH/BTX	Ē
E-24 W V.2	3/13/91	•	TV4/BTX	Œ
			***************************************	
				<del></del>
* /- /#	* *		*	×.
/ 112	eived by: _o	7/17/9/	Date:	<del></del>
Released by: Rece	eived by:		Date:	
Received by Laboratory:	L Bu		Date:	3/13/91
Released by Laboratory:			Date:	
Released by:			Date: _	

#### NOTES TO LABORATORY:

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

Sample Type: W = Water, S = Soil, O = Other (specify)
Container Type: V = VOA, P = Plastic, G = Glass, T = Brass Tube, 0 = Other (specify)

# Subsurface Consultants

CHAIN OF CUSTODY RECORD & ANALYTICAL TEST REQUEST

Project Name: Martin buther king Tr. Way	
SCI Job Number: 430.010	
Project Contact at SCI: Sean Carson	
Sampled By: <u>Cherles Pearson</u>	
Analytical Laboratory: Lurtie & Tompkins	<del></del>
Analytical Turnaround: Normal	
Sample Container Sampling  Sample ID Type <sup>1</sup> Type <sup>2</sup> Date Hold Analysis	Analytical Method
MW-29 W 3xV09 3-28-91 BTEX	
MW-58 W 3x Voa "	
MW-39 W 3x Voa 11	
DE TUH	
WI-25-2 W 21/09 " STEX	
I-25 W 2 x Vac "	
B-25 W Z x Voq "	
E-25 W Zx Voa "	
* * * * *	*
Released by: Check from Received by: Date:	1
Released by: Received by: Date:	
Received by Laboratory: Date:	<del></del>
Released by Laboratory: Date:	
Released by: Date:	<u></u>

#### NOTES TO LABORATORY:

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

Sample Type: W = Water, S = Soil, O = Other (specify)
Container Type: V = VOA, P = Plastic, G = Glass, T = Brass Tube, 0 = Other (specify)

CITY CENTER GARAGE II

REMEDATION PROGRAM

CITY CENTER GARAGE II PARCEL

OAKLAND, CALIFORNIA

4-15-91



## **Woodward-Clyde Consultants**

CITY CENTER GARAGE II

REMEDATION PROGRAM
CITY CENTER GARAGE II PARCEL
OAKLAND, CALIFORNIA

Prepared for

Bramalea Pacific Inc. and The Redevelopment Agency of the City of Oakland

April 15, 1991

Prepared by

Woodward-Clyde Consultants 500 12th Street, Suite 100 Oakland, CA 94607-4014



# **Woodward-Clyde Consultants**

CITY CENTER GARAGE II
REMEDATION PROGRAM
CITY CENTER GARAGE II PARCEL
OAKLAND, CALIFORNIA

Prepared for

Bramalea Pacific Inc. and The Redevelopment Agency of the City of Oakland

April 15, 1991

Prepared by

Woodward-Clyde Consultants 500 12th Street, Suite 100 Oakland, CA 94607-4014



500 12th Street Suite 100 Oakland, CA 94607-4014 (415) 893-3600

## Woodward-Clyde Consultants

April 17, 1991

Mr. Paul M. Smith
Hazardous Materials Specialist
Alameda County Health Care Services Agency
Department of Environmental Health
Hazardous Materials Program
80 Swan Way, Room 200
Oakland, California 94621

Subject:

City Center Garage II Site Remediation Report

Dear Mr. Smith:

This letter transmits a copy of a recently completed report describing remediation activities undertaken to remove native soil containing gasoline and imported fill containing oil, grease and lead from the site of the proposed City Center Garage II. This site is bounded by 12th and 13th Streets and Jefferson Street and Martin Luther King Jr. Way in downtown Oakland.

Previous correspondence regarding this site has been sent to Ms. Katherine Chesick of your office. However, from our recent conversations with you, we understand that you are now the primary contact for projects located within the 94612 zip code, so we are sending this report to you. In accordance with our mutual understanding from previous projects in the area, we are also sending a copy of this report directly to Mr. Lester Feldman of the San Francisco Bay Regional Water Quality Control Board.

Official correspondence regarding this site should be addressed to:

Ms. Lois R. Parr Redevelopment Agency of the City of Oakland 1333 Broadway, 9th Floor Oakland, California 94612

Please send copies of official correspondence to:

Mr. John Esposito Bramalea Pacific, Inc. 1221 Broadway, Suite 1800 Oakland, California 94612

FA:SILE 53.69 19

4

Consulting Engineers, Geologists and Environmental Scientists

## Woodward-Clyde Consultants

I would also appreciate receiving copies of official correspondence. If you have questions regarding the remedial activities described in this report, please feel free to call me at 874-3203.

Yours truly,

WOODWARD-CLYDE CONSULTANTS

George A. Ford Associate

Enclosure:

Report: City Center Garage II Remediation Program, City Center Garage II Parcel,

Oakland, California, April 15, 1991

cc:

Mr. Lester Feldman, SFRWQCB (with report)

Ms. Lois R. Parr (transmittal only)

Mr. John Esposito (transmittal only)

500 12th Street Suite 100 Oakland, CA 94607-4014 (415) 893-3600

## Woodward-Clyde Consultants

April 15, 1991

Mr. John Esposito Bramalea Pacific, Inc. 1221 Broadway, Suite 1800 Oakland, California 94612

Subject: City Center Garage II Remediation Program

Final Report

Dear Mr. Esposito:

We are pleased to submit our report for the City Center Garage II Remediation Program. This report describes the work completed to characterize, excavate and remediate the soil containing petroleum hydrocarbons at the site.

It has been a pleasure working with you on this project. If you have any questions, please do not hesitate to call.

Yours truly,

WOODWARD & CLYDE CONSULTANTS

George A. Ford

Senior Project Geologist

90C0028A2/COT

Enclosure

cc: Ms. Lois Parr

Office of Economic Development and Employment



# **Woodward-Clyde Consultants**

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#### **EXECUTIVE SUMMARY**

### Removal of Soil Containing Gasoline

Chemical analysis of soil and groundwater samples obtained from the site of the proposed City Center Garage II in downtown Oakland in mid-1989 indicated the southwest corner of the site contained soil with elevated concentrations of petroleum hydrocarbons as gasoline. The area of the site containing gasoline-bearing soil was beneath a gas station formerly located on the property. Additional investigations performed by WCC in late 1989 included soil sampling and chemical analysis. Results of this study indicated the gasoline-bearing soil occurred in a layer between the depths of 20 to 25 feet in a relatively narrow band across the southwestern corner of the site.

Various alternatives for remediation of the contaminated soil were evaluated. The method of soil remediation consisting of the excavation and on-site aeration of soil followed by off-site disposal was chosen as the most practical. Plans and specifications for the soil removal and treatment were prepared in February 1990, and a contractor was selected to perform the soil excavation and aeration.

In April through August, 1990, approximately 6600 bank cubic yards of soil were excavated from the site and stockpiled on the site and the adjacent "Old Firehouse Site." The excavation was extended downward to within approximately one foot of the groundwater surface in most parts of the excavation. Portions of the excavation were extended to depths of 4 to 7 feet below groundwater to remove contaminated soil occurring below the groundwater. The areas excavated below the groundwater level were backfilled with uncontaminated sandy fill borrowed from other areas of the site to elevations approximately one foot above the groundwater surface.

Approximately 650 cubic yards of uncontaminated soil from the excavation were used to backfill an open excavation on the adjacent Old Firehouse site. The remaining soil was aerated in accordance with the requirements of the Bay Area Air Quality Management District (BAAQMD) until no gasoline could be detected in the soil. The aerated soil was then disposed in two local Class III landfills, in accordance with local and State regulations.

Closure sampling performed at the bottom of the excavation showed no detectable gasoline remaining in the soil at the locations sampled. Closure sampling performed in the sides of the excavation indicate that gasoline remains in the soil in one area sampled in the west side of the excavation adjacent to Martin Luther King, Jr. Way at a depth of 20 to 25 feet. If required by regulatory agencies, decontamination of soil beyond the vertical limits of the garage basement may be accomplished most efficiently by means of a vapor extraction system during or after construction. Elevated concentrations of petroleum hydrocarbons were not detected in closure samples obtained from the eastern and northern sides of the excavation occurring within the interior of the site.

### Removal of Fill

During the initial stages of the excavation of the gasoline-bearing soil, a five-foot-thick layer of surface fill (approximately 1300 cubic yards) was removed and stockpiled separately from native and gasoline-contaminated soils. Chemical analysis of fill samples indicated elevated concentrations of lead and oil and grease in the stockpiled fill.

Based on the occurrence of contaminated fill in the southwest corner of the site, WCC explored for fill immediately beneath the surface of the remainder of the site. A program of chemical analysis of soil samples collected from soil borings, test pits, and the excavated soil surface indicated irregular layer of fill up to a thickness of about 10 feet

covering native soil over the entire site. The fill was segregated based on field observations and the results of the analytical program.

Approximately 4000 cubic yards (6300 tons) of fill was: 1) a hazardous waste based on the concentration of oil and grease and/or lead; 2) contained concentrations of oil and grease and/or lead above Class II and Class III disposal limits. This material was disposed at a Class I landfill during July 1990.

Approximately 6800 cubic yards of fill, including the 1800-cubic-yard stockpile of fill from the gasoline excavation, was disposed at a Class III landfill from June through August 1990.

Closure sampling in the bottom of the fill removal area showed no detectable oil and grease, and total lead concentrations typical for area native soil at the locations sampled.

It is expected that dewatering for construction of the new garage foundation may produce groundwater from the southwest corner of the site containing gasoline or gasoline components. Contaminated groundwater may be collected separately and piped to the groundwater treatment system operated by the Agency at 14th Street and Martin Luther King Jr. Way, for treatment and discharge to EBMUD. Some segregation, treatment and disposal of backfill soil from the deep excavation may be required if the backfill soil is removed during foundation construction activities. Similarly, excavations for utility vaults beneath the sidewalk on 12th Street may encounter some soil containing gasoline that will require aeration and/or disposal at a Class III landfill.

1.0 INTRODUCTION

#### 1.1 AUTHORIZATION AND SCOPE

This report presents the results of work performed to characterize, remove and dispose of soils containing petroleum hydrocarbons (gasoline), oil and grease and lead that were found on the site of the proposed City Center Garage II in Oakland, California. Woodward-Clyde Consultants (WCC) performed this work on behalf of Bramalea Pacific, Inc. (Bramalea). Bramalea is acting as the agent for the Redevelopment Agency of the City of Oakland (Agency). The services were performed in accordance with the December 20, 1989 Consulting Services Agreement between WCC and Bramalea.

The scope of services for this project was modified over the course of the project, but may generally be described as:

- 1) Reviewing available data and performing additional soil sampling as needed to characterize contaminated soils at the City Center Garage II site;
- 2) Developing a remedial program which is consistent with the objectives of Bramalea and the Agency; and
- 3) Carrying out the remedial program.

WCC began working on this phase of the project in December 1989. Site cleanup including treatment and disposal of soil excavated at the site was completed in November, 1990.

#### 1.2 LIMITATIONS

This report was prepared in general accordance with the accepted standard of practice which exists in the San Francisco Bay Area at the time the investigation was performed. No other warranties are expressed or implied.

2.0 PREVIOUS INVESTIGATIONS

Pre-construction environmental investigations were conducted in 1989 at the site of the City Center Garage II by WCC under a separate contract with the Agency. The results of these studies are discussed in WCC's Environmental Site Assessment report dated September 5, 1989 and the Hydrocarbon Assessment report dated November 1989. The Environmental Site Assessment report consisted of four tasks: 1) collection of information on the site history; 2) review of regulatory agency records for lists of contaminated sites in the area; 3) installation of 12 soil borings and three groundwater monitoring wells with collection and laboratory analysis of soil and groundwater samples; and 4) interpretation of the data and presentation of conclusions.

Generally, the Environmental Site Assessment study concluded that Total Petroleum Hydrocarbons (TPH) as gasoline and low concentrations of organic solvents and phenol occurred in the soil and groundwater samples from beneath the former location of an automobile service station located at the corner of 12th Street and Martin Luther King Jr. Way, in the southwestern corner of the site.

WCC's recommendations included additional soil and groundwater sampling and analysis to more fully characterize the vertical and lateral extent and concentration of gasoline in the soil and groundwater at the former service station site.

These recommendations formed the basis for WCC's subsequent Hydrocarbon Assessment Study. In order to investigate the on-site plume of gasoline contamination, 15 additional borings were drilled and two groundwater

monitoring wells were installed in September 1989. Soil and groundwater samples were collected for laboratory analysis.

The conclusions of the November 1989 Hydrocarbon Assessment Study were as follows:

- 1) TPH as gasoline occurred in a layer between depths of 20 to 25 feet below the street and in a relatively narrow band across the southwestern corner of the site. The band probably extends off-site to the west. TPH-gasoline concentrations in soil ranged up to 11,000 ppm in samples taken adjacent to the Martin Luther King Jr. Way side of the site.
- 2) Concentrations of TPH-gasoline and benzene, toluene, ethyl benzene, and xylenes (BTEX) in the southwestern corner of the site were probably high enough to require groundwater remediation. The data suggested that a plume of hydrocarbons in groundwater may extend westward off-site, beneath Martin Luther King, Jr. Way.

Based on WCC's recommendation, the Agency elected to execute a program of soil remediation prior to construction of the new parking garage on the site.

3.0

EVALUATION OF MITIGATION ALTERNATIVES

### 3.1 RATIONALE FOR THE REMEDIATION PROGRAM

Initial investigations of the City Center Garage II site performed by WCC in 1989 indicated that relatively high concentrations of TPH-gasoline and BTEX occurred in a layer between depths of 20 to 25 feet in the southwestern corner of the site. The new City Center Garage II is proposed to be a multi-story structure with two levels of underground parking, requiring an excavation extending to approximately 23 to 25 feet below street level. Because it was clear that the contaminated soil would be encountered by the foundation excavation for the new garage, and because Bramalea and the Agency were concerned that the special soil handling and disposal procedures required might delay the project's construction contractor, it was concluded that it was preferable to remove the contaminated soil prior to the start of construction. Accordingly, WCC began an evaluation of the various means of removing the contaminated soil. The two principal excavation alternatives considered are described in the following sections.

#### 3.2 UNSHORED EXCAVATION ALTERNATIVE

WCC evaluated an unshored excavation with 1H:1V side slopes. In this alternative, the excavation would encompass at least two lanes (approximately 25 feet) of both 12th Street and Martin Luther King, Jr. Way, and major utilities, including an underground 115 KV power line, a 12-inch water line, and a sanitary sewer line would require temporary support or relocation. In addition, the excavation would require temporary or permanent backfilling with imported or native fill material in order to

restore the sidewalk and streets before the start of garage construction. The costs associated with relocating utilities, restoring the streets and sidewalks and providing temporary backfill made this alternative substantially more costly than the shored excavation alternatives described below.

### 3.3 SHORED EXCAVATION ALTERNATIVE

WCC's evaluation indicated that a shored excavation with vertical walls was preferable because the overall expense would be less than the unshored alternative. The principal advantages of the shored excavation alternative are as follows: 1) no temporary backfilling would be required because the excavation could be left open until construction began; 2) no reexcavation would be required because the shoring could be incorporated into the later excavation for the parking structure; 3) no underground utilities would be exposed or relocated; and 4) the closing of streets to traffic and removal and restoration of the pavement and sidewalks would not be required. The shored excavation with vertical walls was selected by Bramalea and the Agency, and was incorporated by WCC into the plans and specifications prepared for the remediation project. The choice of the type of shoring system to be used was postponed until the contractor's bids could be evaluated.

4.0 SOIL REMOVAL OPERATIONS

#### 4.1 CONTRACTOR SELECTION

Plans and specifications for excavation, aeration, and disposal of soil containing gasoline were prepared by WCC and incorporated into a solicitation and bid package prepared by Bramalea. In accordance with the requirements of the Agency, bids were solicited from interested contractors through public advertisements beginning February 12, 1990. Three responsive bids were received at the public bid opening on March 13, 1990. The contract to perform the work was awarded to the low bidder, HSR, Inc. of San Jose, California. HSR began site preparation work on April 2, 1990.

#### 4.2 EXCAVATION OF SOIL

The initial excavation limits used in the plans and specifications were selected based on the results of chemical analysis of soil samples obtained during the November 1989 hydrocarbon assessment. This area covered approximately 10,000 square feet in the southwest corner of the parcel, as shown on Figure 1. Initial site preparation consisted of removing the asphalt concrete pavement and light standards. The asphalt was recycled. Excavation of soil began on April 6, 1990. A distinctive layer of soil interpreted as fill material was found to occur in a 5-foot-thick layer immediately beneath the asphalt. This dark brown to black soil containing brick fragments was stockpiled on the eastern side of the excavation.

Based on a lower bid price for a soil nail and shotcrete shoring system, the soil nailing alternative was selected to reinforce and shore

the excavation. The excavation process consisted of the removal and stockpiling of a 5-foot-thick layer of soil followed by the installation of a 5-foot-high row of soil nails and shotcrete. The installation of each lift of soil nails required 2 to 3 days. The first row of soil nails was installed beginning April 13, 1990.

During the soil nailing process, the excavation crew continued to work in the areas of the excavation more remote from the vertical faces adjacent to the streets. As the excavation progressed, hotspots of soil within the excavation and some soil nail auger cuttings drilled from beneath 12th Street and Martin Luther King, Jr. Way were found to contain gasoline. An approximately 10-foot-diameter area of soil believed to contain gasoline was identified beneath the fill approximately 40 feet east of Martin Luther King, Jr. Way and 90 feet north of 12th Street. On April 15, 1990, the hotspot was excavated to a depth of 22 feet using a track-mounted excavator to remove and separately stockpile the soil containing gasoline. The gasoline-bearing soil formed a cone which increased in diameter with increasing depth. This soil was removed and placed near the intersection of 14th Street and Martin Luther King, Jr. Way in a separate, covered stockpile.

As the excavation progressed, efforts were made to segregate soil containing gasoline from clean native soil prior to stockpiling. The volume of soil containing gasoline generally increased within each successive 5-foot-thick layer. The first through the fifth excavated lifts contained a percentage of gasoline-bearing soil of approximately 10%, 40%, 75%, 100%, and 100%, respectively. The gasoline-bearing soil was stockpiled in three stockpiles: 1) on the adjacent parking lot south of 13th Street; 2) near the northwest corner of the Old Firehouse Site (the adjacent block to the north bounded by 13th and 14th Streets and Jefferson Street and Martin Luther King, Jr. Way); and 3) on the closed portion of 13th Street adjacent to the City Center Garage II parcel. The clean soil was stockpiled near the northeast corner of the Old Firehouse Site.

Work on the lowermost level of soil nails began on May 8, 1990 after excavation of the final lift of soil. Excavation work was completed by May 11, 1990. The base of the excavation occurs at approximately 27 feet below the street elevation, or approximately elevation 6 to 7 feet, based on the City of Oakland Datum (C.O.O.D.). This elevation was approximately 0.5 foot above the water table. The approximate configuration of the completed excavation is shown in Figure 2.

5.0 SOIL DISPOSAL

#### 5.1 AERATION OF SOIL CONTAINING GASOLINE

A total of 63 samples of the excavated soil were obtained and submitted for laboratory analysis at various times throughout the excavation and shoring process. The purpose of the analytical program was to measure the concentration of TPH-gasoline to evaluate whether the soil could be disposed of directly at a Class III landfill or would require aeration prior to the off-site disposal. Most Class III landfills specify that soil must contain less than 100 ppm TPH to be accepted for disposal. If the TPH concentration is greater than 100 ppm, the soil may be aerated to volatilize the hydrocarbons until concentrations are less than this threshold. For soil requiring aeration, the allowable rate of aeration is specified by the Bay Area Air Quality Management District (BAAQMD) based on the average concentration of TPH in the soil to be aerated.

Composite samples of excavated soil were obtained from four discrete samples in accordance with BAAQMD guidelines. The samples were retained in 2-inch-diameter by 4-inch-long brass liners. The ends were sealed using teflon sheeting placed between the soil and plastic endcaps. The samples were placed in an ice chest with "blue ice" for transport under chain-of-custody control to Chromalab Inc., a State-certified subcontractor testing laboratory.

The analytical results are summarized in Table 1 and shown in Appendix B. The analytical results may be summarized as follows:

- 1) The reported concentration of TPH-gasoline ranged from zero to 1000 ppm in the analyzed samples. The average TPH concentration for soil samples from the three major stockpiles was 184 ppm, 250 ppm, and 14 ppm.
- 2) The reported concentration of total lead in the stockpiled soil ranged from 2.3 ppm to 29 ppm in the analyzed samples.
- 3) Oil and Grease was not detected in any of the 7 analyzed samples.

WCC reported the average TPH-gasoline concentrations by telephone to the BAAQMD on May 16, 1990 as required by BAAQMD regulation 8, rule 40, "Aeration of Contaminated Soil and Removal of Underground Storage Tanks", July 16, 1986.

Aeration operations on the two stockpiles averaging greater than 50 ppm TPH began on July 17, 1990. The aeration areas were located in the north and east sides of the Old Firehouse Site, in the closed portions of 13th Street and Jefferson Street and in the eastern portion of the City Center Garage II site. The aeration process involved spreading of soil from the stockpiles using a rubber-tired loader into lifts approximately 8 to 10 inches thick. The layer of soil was then rototilled several times per day using a tractor-powered rototiller. Aeration was considered complete when gasoline vapors became negligible and the concentration of hydrocarbon vapors as measured by an organic vapor detector became less than 100 ppm. After post-aeration sample collection, the aerated soil was stockpiled onsite for later hauling to a disposal site. Aeration of approximately 8400 bulk cubic yards of soil containing gasoline was completed in late October, 1990. Figure 3 shows typical locations on the site and the adjacent Old Firehouse site which were used for soil stockpiles and aeration operations.

#### 5.2 DISPOSAL OF AERATED SOIL

Samples of the aerated soil were obtained for analysis to characterize the soil sufficiently for disposal in a local Class III landfill. Samples were obtained in accordance with the Leaking Underground Fuel Tank (LUFT) Field Manual, May 1988 and BAAQMD guidelines. Four discrete samples were collected from every approximately 50 cubic yards. These four samples were then composited at the analytical laboratory forming one composite sample for analysis. Samples were retained in four-inch brass liners with teflon sheeting placed between the soil and plastic end caps. The samples were placed in an ice chest with "blue ice" for shipment to Chromalab Analytical Laboratory under chain-of-custody control. The aerated soil samples were analyzed for TPH using EPA Method 8015, modified, and BTEX using EPA Method 8020. Selected samples were analyzed for total lead using EPA Method 3050/7420, extractable lead using EPA Method 3010/7420 with extraction as per CAM title 22 WET, diesel using EPA Method 3500/8015, and oil and grease using EPA Method 503 D&E.

The results of the laboratory analysis of the aerated soil samples are summarized in Table 1 and shown in Appendix B. The results of the soil analysis are summarized as follows:

- 1) No TPH, BTEX, diesel, or oil and grease were reported above detection limits in any of the 184 soil samples analyzed.
- 2) One hundred sixty post-aeration soil samples were analyzed for total lead. Total lead concentrations were reported to range from below the detection limit to 41.0 ppm. Of the 181 pre- and post-aeration soil samples analyzed for total lead, only 7, or 4%, contained reported concentrations of lead higher than the range of lead expected for clean native soil in downtown Oakland.

3) One hundred fifty samples were analyzed for extractable lead using the Waste Extraction Test. Concentrations of extractable lead were reported to range from below the detection limit to 1.98 ppm.

On May 4 and 7, 1990, approximately 600 bulk cubic yards of unaerated soil containing less than 100 ppm TPH-gasoline was hauled and disposed at the Redwood Sanitary Landfill, Novato, California. The concentration of TPH-gasoline in this soil was reported to range from below the detection limit (2.5 ppm) to 24 ppm with an average TPH concentration of 4 ppm. The reported concentration of total lead in three samples (DT1 through DT3) ranged from 5.0 ppm to 10 ppm, within the range of lead concentrations expected for native soil in downtown Oakland. The analytical results are summarized in Table 1 and shown in Appendix B. The sample numbers are DT1 through DT3 and DT9 through DT11.

After accepting approximately 600 cubic yards, the Redwood landfill refused to accept any additional soil from the entire City Center Garage II site based on the landfill's concerns regarding possible lead and oil and grease contamination of the soil. Redwood Landfill's concern focused on the occurrence of fill elsewhere on the site containing lead and oil and grease at concentrations above what was acceptable for disposal at the landfill. In the opinion of WCC, the Redwood's concern was unfounded because the soil proposed for disposal at Redwood Landfill was sampled and analyzed following standard practice and the all chemical analyses indicated the soil met the landfill's criteria for disposal.

Approximately 650 cubic yards of uncontaminated soil was segregated from hydrocarbon-bearing soil during the excavation of the second and third excavation lifts. This native soil was stockpiled at the northeast corner of the Old Firehouse Site. Eighteen soil samples from this stockpile were obtained for chemical analysis to document a lack of hydrocarbons in this soil. Samples of this unaerated soil were obtained in accordance with the guidelines in the Leaking Underground Fuel Tank (LUFT) Field Manual, May 1988. Four discrete samples were collected from every approximately 50

cubic yards. These four samples were then composited at the analytical laboratory forming one composite sample for analysis. Samples were retained in four-inch brass liners with teflon sheeting placed between the soil and plastic end caps. The samples were placed in an ice chest with "blue ice" for shipment to Chromalab under chain-of-custody control.

The 18 soil samples were analyzed for TPH using EPA Method 8015, modified and BTEX using EPA Method 8020. The analytical results are summarized in Table 1 and shown in Appendix B. The samples are designated CN5 through CN9, CN26 through CN33, and SC1 through SC5. No TPH-gasoline or BTEX was reported above detection limits in any of the 18 soil samples.

After consultation and agreement with Bramalea, the Agency and Subsurface Consultants, Inc. (the consultant for remedial work at the Old Firehouse Site), the 650 cubic yards of uncontaminated soil was placed in the excavated pit on the Old Firehouse Site for eventual use as compacted backfill.

An application for disposal of approximately 1700 cubic yards of aerated soil was submitted to Zanker Material Recovery Systems, Inc. (Zanker Road Landfill), San Jose, California on August 15, 1990. The landfill agreed to accept this soil. HSR hauled and disposed the soil at Zanker Road Landfill in late August 1990.

During efforts to locate a disposal site for the 1700-cubic-yard batch of aerated soil discussed above, an additional 1300 cubic yards of soils had been aerated. An application for disposal of this soil was submitted to Durham Road Landfill in Fremont, California. Despite repeated efforts to get a response from the landfill, no acceptance or denial of the application was ever received.

Chemical analysis of soil samples from several stockpiles containing approximately 1900 cubic yards of aerated soil indicated that extractable lead concentrations with the stockpiles exceeded those acceptable for

Mountain View Landfill, but fell within the range of concentrations acceptable to Zanker Road Landfill. WCC, therefore, submitted an application for disposal of the 1900-cubic-yard stockpile of aerated soil to the Zanker landfill on October 26, 1990. The soil was accepted for disposal and hauled to the landfill for disposal in late October.

Aeration was completed in mid-October 1990. After the initial disposal of soil in August, approximately 7000 cubic yards of soil were aerated and stockpiled. Because of inaction regarding the disposal application at Durham Landfill, WCC contacted other Class III landfills in the region regarding disposal of aerated soil. Mountain View Landfill in Mountain View, California was selected as the best disposal alternative based on disposal cost and acceptance criteria.

WCC submitted two separate applications for disposal of approximately 1450 bulk cubic yards and 3950 bulk cubic yards of aerated soil to the Mountain View Landfill on October 31, 1990 and November 6, 1990, respectively. Upon acceptance of the application, the aerated soil was hauled and disposed at Mountain View Landfill in mid-November, 1990.

6.0 FILL REMOVAL OPERATIONS

#### 6.1 CHARACTERIZATION OF FILL

A 5-foot-thick layer of fill soil located immediately below the pavement surface in the area of the excavation was excavated and stockpiled adjacent to the east side of the excavation, separate from native soil. The location of this stockpile is shown on Figure 3.

Samples of the fill were obtained from the stockpile in order to characterize the chemical nature of the material so that disposal options could be evaluated. Eight samples were collected on April 9, 1990 for analysis to provide a preliminary characterization. The samples were retained in 2-inch diameter by 4-inch long brass liners hand-driven at the base of a one-foot-deep hole in the stockpile. Teflon sheeting was placed between the soil and plastic endcaps. The samples were placed in an ice chest with "blue ice" for transport under chain-of-custody control to Chromalab.

The fill samples were analyzed for TPH-gasoline using EPA Method 8015, modified, BTEX using EPA Method 8020, and oil and grease using EPA Method 503 D&E. Selected samples were analyzed for CAM 17 metals. A composite sample composed of four discrete samples was analyzed for chlorinated pesticides using EPA Method 8080 and volatile organics using EPA Method 8270.

The results of the laboratory analysis of the fill soil samples are summarized in Table 2 and shown in Appendix B. These fill samples are

numbered FL-1 through FL-8. The results of the soil analysis are summarized as follows:

- 1) No TPH gasoline or BTEX was detected above detection limits in any of the 8 samples.
- 2) Thhe concentration of oil and grease was reported to range from below the detection limit (50 ppm) to 66 ppm.

An additional eight samples were obtained on May 4, 1990 for analysis to provide additional chemical characterization of the fill. The samples were retained in 2-inch diameter by 4-inch long brass liners hand-driven at the base of a one-foot-deep hole in the stockpile. Teflon sheeting was placed between the soil and plastic endcaps. The samples were placed in an ice chest with "blue ice" for transport under chain-of-custody control to Chromalab Analytical Laboratory.

The fill samples were analyzed for total lead using EPA Method 3050/7420, extractable lead using EPA Method 3010/7420 with extraction per CAM Title 22 WET, and oil and grease using EPA Method 503 D&E.

The results of the laboratory analysis of the fill soil samples are summarized in Table 2 and shown in Appendix B. These samples are designated FL-9 through FL-16. The results of the soil analysis are summarized as follows:

- 1) The concentration of total lead was reported to range from 37 ppm to 86 ppm in the analyzed samples.
- 2) The concentration of extractable lead, extracted as per WET procedures, was reported to range from 0.2 ppm to 0.8 ppm in the analyzed samples.

3) The concentration of oil and grease was reported to range from below the detection limit (50 ppm) to 100 ppm in the analyzed samples.

The occurrence of extractable lead concentrations exceeding 0.5 ppm limited the available Class III landfill disposal options. Zanker landfill in San Jose was the only Bay Area landfill identified that could accept the fill. The results of chemical analysis of the fill were transmitted to the landfill. After acceptance of the soil by the landfill, HSR, Inc. hauled the approximately 1300-cubic-yard stockpile of fill to Zanker Landfill in late June 1990.

Based on the occurrence of elevated lead and oil and grease in the surface fill removed from the gasoline excavation area, additional shallow borings were drilled on the rest of the site in order to characterize the lead and oil and grease content of other surficial fill on the site.

The initial fill investigation consisted of drilling nine borings on June 1, 1990 to explore the thickness and chemical characteristics of fill over the rest of the site. The borings were drilled to depths of between 6 feet and 11 feet using 8-inch, hollow stem augers. The locations of the soil borings, designated FL1 through FL9, are shown on Figure 4. The borings were advanced to slightly below the contact between the fill material and native soil. The depth of this contact was interpreted by WCC field personnel based on the appearance of the recovered soil samples. The thickness of the fill layer identified in the borings varies from about 4 feet to 10 feet but averaged approximately 5 feet.

Soil samples for chemical analysis were obtained at selected depths within the fill in each boring using a 2-inch inside-diameter drive sampler. Samples were generally obtained at depths of 3 feet in the fill material and 6 feet in native soil. The samples were retained in brass liners capped with teflon sheeting and plastic end caps. The soil sampler was cleaned between each sample and between borings by washing in an

Alconox detergent and tap water solution followed by a tap water rinse. Soil samples were immediately placed in an ice chest with "blue ice" for transport to Chromalab Analytical Laboratory under chain-of-custody control. Logs of the borings showing the depth of the contact between fill and native soil and the depth of soil samples are included in Appendix A.

Eleven soil samples of the fill were analyzed for oil and grease using EPA Method 503 D&E, total lead using EPA Method 3050/7420, and extractable lead using EPA Method 3010/7420 with extraction as per California Assessment Manual (CAM) Title 22 Waste Extraction Test (WET). The results of the laboratory analysis of the soil samples are summarized in Table 2 and are shown in Appendix B.

Based on the results of the first round of fill sampling, a second round of soil borings was drilled on June 13 and 14, 1990 to further characterize the fill in accordance with the additional analytical requirements of area landfills. Generally, local Class III landfills require a minimum sampling frequency of one sample per 100 cubic yards. Therefore, 140 samples would be required to dispose of the estimated maximum volume of fill of about 14,000 bulk cubic yards. Twenty-seven samples from the stockpile and the nine borings discussed above had already been analyzed. A total of 45 additional borings were drilled to obtain the required 113 samples using 6-inch diameter solid augers. The borings were drilled to a depth of 4 feet and 5 feet in alternate borings. Two samples were obtained in the 4-foot borings at depths of 2 feet and 4 feet. Three samples were obtained in the 5-foot borings at depths of 1 feet, 3 feet, and 5 feet. The locations of the soil borings, designated F1 through F45, are shown on Figure 4.

Soil samples for chemical analysis were obtained at the selected depths within each boring using a 2-inch inside-diameter drive sampler. The samples were retained in brass liners capped with teflon sheeting and plastic end caps. The soil sampler was cleaned between each sample and

between borings by washing in an Alconox detergent and tap water solution followed by a tap water rinse. Soil samples were immediately placed in an ice chest with "blue ice" for transport to Chromalab Analytical Laboratory under chain-of-custody control. Logs of the borings showing the depth of the soil samples are included in Appendix A.

One hundred thirteen samples of the fill were analyzed for oil and grease using EPA Method 503 D&E and total lead using EPA Method 3050/7420. The results of the laboratory analysis of the soil samples are summarized in Table 2 and are shown in Appendix B. The results may be summarized as follows:

- 1) The concentration of oil and grease in soil samples was reported to range from below the detection limit (50 ppm) to 4,800 ppm. The average concentration for all samples was 59 ppm.
- 2) The concentration of total lead in soil samples was reported to range from 2 ppm to 2,630 ppm. Two samples from borings F8 and F21 contained lead at concentrations greater than 1000 ppm, the Total Threshold Limit Concentration (TTLC). The TTLC is the threshold beyond which a material is characterized as a hazardous waste under Title 22 of the California Administrative Code (CAC). Therefore, at least a portion of the fill material may be classified as a hazardous waste based on its total lead content.
- 3) The concentration of extractable lead, analyzed using the WET test, was reported to range from 0.2 to 0.8 ppm. The Soluble Threshold Limit Concentration (STLC) for lead is 5 ppm. Generally, materials yielding WET lead results in excess of 5 ppm would be considered hazardous waste for purposes of disposal under Title 22 of the CAC.

#### 6.2 EXCAVATION OF FILL

The results of chemical analysis of fill samples, discussed above in Section 6.1, indicated that portions of the fill contained oil and grease and lead exceeding the 100 ppm concentration limit for disposal at Zanker Landfill. During late June and early July 1990, HSR, under the direction of WCC, excavated and segregated fill material from the City Center Garage II site to a depth of between 1 and 10 feet. WCC estimated the depth of excavation based on the results of chemical analysis of the fill samples. The criteria for the segregation of the fill was the 100 ppm oil and grease concentration limit for disposal at Zanker Landfill.

After this initial excavation, WCC performed additional fill sampling in areas previously yielding samples with concentrations of lead greater than 50 ppm. The purpose of the additional sampling was to further define areas of fill suitable for disposal at Zanker Road Landfill and segregate material unacceptable for disposal at the landfill. WCC collected 40 samples, designated SF1 through SF40, at the ground surface after the removal of a layer of fill. Twelve test pit samples designated TP1-1 through TP4-2, were collected in excavations to explore the thickness of fill. Five samples designated Z1 through Z5 were collected from stockpiles. The sampling locations are shown on Figure 4. The results of the chemical analysis of these samples are summarized in Table 2 and shown in Appendix B.

At each sampling location, a 2-inch by 4-inch brass liner was hand-driven into the soil surface. The sample liners were initially cleaned using an Alconox detergent and tap water solution followed by a tap water rinse. The soil samples were retained in the brass liners with teflon sheeting placed between the soil and plastic endcaps. The samples were placed in an ice chest with "blue ice" for transport under chain-of-custody control to Chromolab Analytical Laboratory.

The fill samples were analyzed for total lead using EPA Method 3050/7420, extractable lead using EPA Method 3010/7420 with extraction as per CAM Title 22 WET, and oil and grease using EPA Method 503 D&E.

The results of this round of fill sampling are summarized as follows:

- 1) The concentration of oil and grease in soil samples was reported to range from below the detection limit (50 ppm) to 230 ppm. Oil and grease was reported in five samples. Soil containing greater than 100 ppm oil and grease was unacceptable for disposal at Zanker Landfill.
- 2) The concentration of total lead in soil samples was reported to range from 0.05 ppm to 694 ppm. Although no reported concentrations exceeded the 1000 ppm TTLC for lead, it was generally thought that soil containing over 100 ppm total lead would probably yield WET lead results exceeding the 5 ppm STLC value, rendering it unacceptable for disposal at the Zanker landfill.
- 3) The concentrations of extractable lead, as analyzed using the WET test, ranged from below the detection limit (0.10 ppm) to 12.8 ppm. The STLC for lead is 5 ppm. Soil with greater than 5 ppm extractable lead was considered hazardous waste for the purposes of disposal.
- 4) Polynuclear aromatic (PNA) organic compounds were not detected in the "Z" samples.

HSR, under the direction of WCC, constructed two stockpiles of fill based on the analytical results of samples collected from borings, surface samples, test pits, and stockpiles. The criteria for segregation was whether the material yielded samples with concentrations of oil and grease and/or lead exceeding disposal limits at Zanker Road Landfill or which defined the material as a hazardous waste.

### 6.3 DISPOSAL OF FILL

HSR hauled and disposed of approximately 3000 cubic yards of fill with high oil and grease and/or lead concentrations at the Chemical Waste Management, Inc. Class I facility at Kettleman Hills California during mid-July 1990. The remaining 5500 cubic yards of fill containing lower concentrations of oil and grease and/or lead were hauled and disposed at Zanker Landfill in late July, 1990.

7.0 END-OF-PROJECT CONDITIONS

#### 7.1 GASOLINE EXCAVATION

## 7.1.1 Excavation Bottom Sampling and Soil Removal

Four rounds of excavation and sampling were required to remove soil containing gasoline from the bottom of the excavation. Initially, soil samples were collected from the bottom of the completed excavation at approximately 27 feet below the street surface on May 4, 1990. sampling locations are shown on Figure 2. Sixteen soil samples were obtained from the following areas: 1) nine samples from the base of the excavation designated BTM1 through BTM9; 2) two from the base of the wall on the 12th Street side designated 12TH1 and 12TH2; 3) two from the base of the wall on the Martin Luther King, Jr. Way side designated MLK1 and MLK2; and 4) three from the unshored, sloping face designated WALL1 through WALL3. At each sampling location, a 2-inch diameter by 4-inch long brass liner was hand-driven at the base of a one-foot-deep hole. The soil samples were retained in the brass liners with teflon sheeting placed between the soil and plastic endcaps. The samples were placed in an ice chest with blue ice for transport under chain-of-custody control to Chromalab Analytical Laboratory. The soil samples were analyzed for TPH as gasoline using EPA Method 8015 (modified) and BTEX using EPA Method 8020.

In the nine samples from the floor of the excavation, the concentration of TPH-gasoline was reported to range from below the detection limit (2.5 ppm) to 47 ppm. The analytical results are summarized in Table 3 and shown in Appendix B.

Because of the low concentrations of TPH as gasoline and BETX present in the bottom of the excavation, after consultation with the Agency and Bramalea, WCC directed HSR to rototill the bottom of the excavation to promote aeration. After aeration for several weeks, WCC collected a second round of soil samples from the excavation bottom. Analytical results of these samples, designated B-1 through B-9 and F-1 through F-3, are summarized in Table 3 and shown in Appendix B. The results are summarized as follows:

- 1) The concentration of TPH-gasoline in soil samples was reported to range from below the detection limit (50 ppm) to 6900 ppm.
- 2) The concentration of xylenes in soil samples were reported to range from below the detection limit (0.005 ppm) to 64 ppm.

A third round of excavation was then required to remove the TPH hotspots identified by the second round of sampling.

Because the excavation occurred at elevation 6 to 7 feet C.O.O.D., approximately 0.5 foot above the groundwater, temporary dewatering was required to deepen the excavation any farther. HSR excavated two small pits for the collection of groundwater samples. The analytical results of the groundwater samples are summarized in Table 4 and shown in Appendix B. Because TPH-gasoline and BTEX were identified in the groundwater, the groundwater was pumped from a sump pit to a Baker tank for temporary storage. After completion of the dewatering, the stored groundwater was pumped from the Baker tank to the ground water treatment system on the Old Firehouse Site for treatment. After treatment, the groundwater was discharged to the sanitary sewer with the approval of EBMUD.

Approximately 300 cubic yards of soil was removed from the bottom of the excavation during the third round of excavation. Generally, the excavation was deepened to elevation 3 to 4 feet C.O.O.D. In one area along Martin Luther King Jr. Way, the excavation was deepened to approximate elevation minus 1 foot C.O.O.D. HSR transported the excavated soil to the pre-aeration stockpiles and borrowed clean native soil from elsewhere on the City Center Garage II site. The clean borrow was placed in the excavation and lightly compacted using a rubber-tired loader to bring the excavation bottom up to elevations 5 to 6 feet C.O.O.D., above the static groundwater level.

WCC collected 8 soil samples from the bottom of the gasoline excavation after the completion of the third round of excavation. The sampling locations are shown in Figure 2. At each sampling location, a 2-inch by 4-inch brass liner was hand-driven at the base of the excavation. The sample liners were initially cleaned using an Alconox detergent and tap water solution followed by a tap water rinse. The soil samples were retained in the brass liners with teflon sheeting placed between the soil and plastic endcaps. The samples were placed in an ice chest with "blue ice" for transport under chain-of-custody control to Chromolab Analytical Laboratory.

The soil samples were analyzed for TPH-gasoline using EPA Method 8015, modified, and BTEX using EPA Method 8020. The results of chemical analysis of these samples, designated 1 through 8, are summarized in Table 3 and shown in Appendix B. TPH-gasoline was reported in one soil sample at a concentration of 6.8 ppm. WCC then directed HSR to excavate soil from the area of the sample and backfill the excavation with clean soil from elsewhere on the site.

WCC collected two soil samples from this re-excavated area. The sampling locations are shown on Figure 2. At each sampling location, a 2-inch by 4-inch brass liner was hand-driven at the base of the

excavation. The sample liners were initially cleaned using an Alconox detergent and tap water solution followed by a tap water rinse. The soil samples were retained in the brass liners with teflon sheeting placed between the soil and plastic endcaps. The samples were placed in an ice chest with "blue ice" for transport under chain-of-custody control to Chromolab Analytical Laboratory.

The soil samples were analyzed for TPH-gasoline using EPA Method 8015, modified and BTEX using EPA Method 8020. The results of chemical analysis of these samples, designated 9 and 10, are summarized in Table 3 and shown in Appendix B. The concentration of TPH-gasoline and BTEX was reported below the detection limit of 2.5 ppm and 0.005 ppm, respectively. At this point, removal of soil containing gasoline was considered complete based on the non-detection of TPH-gasoline or BTEX in soil samples of soil in the bottom of the excavation.

## 7.1.2 TPH Concentrations Adjacent to the Excavation

As discussed above in Section 6.1, WCC collected five soil samples from the walls of the excavation adjacent to 12th Street, Martin Luther King Jr. Way and the adjacent portion of the site.

Two samples were obtained from the base of the excavation wall along Martin Luther King, Jr. Way. Reported TPH-gasoline concentrations ranged from below the detection limit to 890 ppm. Reported benzene concentrations ranged from 0.032 ppm to 3.5 ppm. Reported toluene ranged from 0.0051 ppm to 10.0 ppm. Reported ethyl benzene concentrations ranged from below the detection limit (0.005) to 7.5 ppm. Reported xylenes ranged from 0.005 to 14.0 ppm.

Two samples were obtained from the base of the 12th Street wall of the excavation. TPH and BTEX were not detected in these samples. Soil nail borings extended horizontally beneath 12th Street at approximate depths of

5 and 10 feet beneath the sidewalk locally produced small quantities of soil cuttings with a gasoline odor. The occurrence of contaminated soil in these borings suggests that some gasoline may remain in the soil at relatively shallow depths beneath 12th Street and/or the sidewalks. It is inferred that the gasoline in soil at shallow depth beneath the street does not apparently extend to greater depth or impact the groundwater because:

1) samples taken from the excavation wall adjacent to 12th Street at depth showed no detectable gasoline or BTEX; 2) soil nail borings at depths of 15 and 20 feet in the same area produced no contaminated soil; and

3) groundwater samples taken from monitoring wells MW-26 and -27 (shown in Figure 1) prior to excavation showed no detectable gasoline or BTEX.

Three samples were obtained from the base of the unshored, sloping wall of the excavation within the interior of the site. TPH and BTEX were not detected in these samples. The analytical results are summarized in Table 3 and shown in Appendix B.

#### 7.2 FILL AREA

WCC collected 60 closure soil samples in the fill areas outside the gasoline excavation. The sampling locations are shown on Figure 5. Twenty samples were collected at the ground surface. Forty subsurface samples were collected in pits excavated using a backhoe; 20 at a depth of 2 to 3 feet and 20 at a depth of 5 feet. The subsurface samples were composited into 20 samples, i.e., one sample per pit. At each sampling location, a 2-inch by 4-inch brass liner was hand-driven into the soil. The sample liners were initially cleaned using an Alconox detergent and tap water solution followed by a tap water rinse. The soil samples were retained in the brass liners with teflon sheeting placed between the soil and plastic endcaps. The samples were placed in an ice chest with "blue ice" for transport under chain-of-custody control to Chromalab Analytical Laboratory.

The fill samples were analyzed for total lead using EPA Method 3050/7420, and oil and grease using EPA Method 503 D&E. The results of chemical analysis of these samples, designated C-la through C-20bc, are summarized in Table 4 and shown in Appendix B. The results are summarized as follows:

- 1) The concentrations of total oil and grease, including non-petroleum fatty acids, were reported to range in three samples from 50 ppm to 76 ppm. The detection limit was 50 ppm.
- 2) Non-polar oil and grease (the petroleum hydrocarbon fraction) was not detected at concentrations exceeding the detection limit of 100 ppm.
- 3) The concentration of total lead was reported to range from 1.2 ppm to 4.7 ppm, concentrations typical for native soil of the Merritt Formation.

Because of concern that some of the samples could contain petroleum-type oil and grease at concentrations between 50 and 100 ppm, six of the samples were reanalyzed for non-polar (petroleum-type) oil and grease using a lower detection limit of 50 ppm. The samples included the three samples containing reported oil and grease. The results of these chemical analyses, summarized in Table 4 and shown in Appendix B, indicate that no petroleum-type oil and grease was detected in any sample except sample C-2a at a concentration of 88 ppm. Soil from the area of sample C-2a was excavated and transported to a stockpile of soil for disposal at a landfill as discussed in Section 5.2. Based on the results of this closure sampling and the additional cleanup in the vicinity of sample C-2a, the removal of fill contaminated with lead and oil and grease was considered complete.

After the completion of the removal of fill and gasoline-bearing soil, program, approximately 8000 cubic yards of clean native soil was borrowed from the site to use as backfill in an excavation on the east side of the Old Firehouse Site. As part of this work, HSR regraded the fill area to

develop stable slopes adjacent to bordering streets. The end-of-project conditions are shown schematically on Figure 6.

### 7.3 STATUS OF UNDERGROUND TANKS

WCC presently believes that it is unlikely that underground tanks continue to exist on site for the following reasons:

- 1) City of Oakland Fire Department records indicate that a permit was issued in 1979 for the removal of tank(s) from the site;
- 2) No underground tanks were encountered within the gasoline-soil excavation area; and
- 3) No underground tanks were encountered by holes drilled for the installation of the soil nail shoring system along 12th Street and Martin Luther King Jr. Way.

#### 7.4 STATUS OF MONITORING WELLS

Monitoring wells MW-4, -5, -12, -26 and -27 installed by WCC for the November 1989 hydrocarbon assessment performed for the Agency were physically removed from the site during the 1990 remediation activities. The former locations of these monitoring wells are shown on Figure 1. Monitoring well MW-4 was removed by the gasoline soil removal activities performed by Subsurface Consultants and HSR at the intersection of 13th and Jefferson Streets. Wells MW-5, -26 and -27 were removed from the southwestern corner of the properly during the excavation of gasoline bearing soil described in this report. Monitoring well MW-12 was removed from the southeastern corner of the site during the fill removal operations.

8.0 RECOMMENDATIONS

### 8.1 FOUNDATION CONSTRUCTION

# 8.1.1 Foundations Within the Gasoline-Soil Excavation

Within the gasoline-soil excavation at the southwestern corner of the site, certain areas were excavated to elevations ranging from minus 1 foot to plus 6 feet C.O.O.D., below the bottom of the planned footing elevations. The area has been backfilled with fill up to average elevation 5 to 6 feet C.O.O.D. In order to maintain a homogeneous foundation system, WCC's December 17, 1991 Final Geotechnical Engineering Study recommended that the design footing elevation be lowered so that the footings will be founded on native undisturbed soils. As an alternative, the area should be cleared of all fill materials down to the native soils and be backfilled with lean-mix concrete up to the planned bottom of the footings. The actual depth of the required footing and/or backfill concrete excavation will need to be determined in the field by the Geotechnical Engineer. Dewatering wells and/or sumps will be required to lower the groundwater level in order to properly remove all fill and loose soils without causing further disturbance of the natural dense sands by pumping. Based on the conditions observed when the excavation was initially extended below the groundwater, it may be possible to dewater the corner sufficiently (for a short period) using interior sumps only. The dewatering system should remain in operation until the lean concrete is poured. At that time, the wells and/or sumps should be backfilled with cement grout or lean concrete, as appropriate.

A less desirable alternative would be to support the southwestern corner of the building on drilled pier foundations. Because some differential settlements between piers and adjacent spread footings may be expected, WCC recommends that a construction joint be placed at the transition between the spread footing and drilled pier areas of the building. WCC's December 17 geotechnical report provides design recommendations for piers.

## 8.1.2 General Site Excavation

Although it is our opinion that the remedial work described in this report has removed the soil containing high concentrations of TPH-gasoline from the area to be excavated for the City Center Garage II foundation, WCC recommends that the project's general contractor and excavating and shoring subcontractors be made aware of the possibility of encountering petroleum hydrocarbons within the site. We recommend that the contractors consider the health and safety issues for workers and prepare a plan which includes the contingency of encountering possible contaminants. WCC will be available to assist with preparation or implementation of health and safety quidelines.

The backfill soil placed in the deep excavation has been in contact with groundwater containing approximately 1 ppm gasoline for several months. It is likely that this backfill soil will contain trace quantities of gasoline when (and if) it is removed from the excavation. Any backfill soil exhibiting detectable petroleum odors should be segregated from other clean soil, aerated and disposed at a local Class III landfill in accordance with local and State regulations.

During the intitial excavation at the site, soil nail borings extended beneath 12th Street at approximate depths of 5 and 10 feet below sidewalk level locally produced small quantities of soil cuttings with a gasoline odor. These cuttings were aerated and disposed in accordance with local

and State regulations. These borings indicate that there is some possibility that utility vault excavations to be made beneath the 12th Street sidewalk may encounter soil containing gasoline. If encountered, such soil should be segregated from other clean soil, aerated and disposed at a local Class III landfill in accordance with local and State regulations.

#### 8.2 DEWATERING ACTIVITIES

Field observations made and groundwater samples taken during the site remedial work indicate that groundwater beneath the western end of the City Center Garage II Site contains TPH-gasoline and related compounds. The initial water discharged from dewatering wells and/or sumps in this area should be tested for petroleum hydrocarbons such as gasoline, and benzene, toluene, ethylbenzene and xylenes (TPH/BTEX). Discharge water found to contain TPH/BTEX may then be routed to the existing groundwater treatment facility operated by the Agency at 14th Street and Martin Luther King, Jr. Way. Provision should be made in the project specifications to allow for separate plumbing of sumps and dewatering wells as required, and for installation of a pipe to transfer water from the project site to the treatment facility.

The groundwater discharge to the treatment facility and the untreated water from other areas of the site discharged to the storm sewer should be periodically sampled and analyzed to document that no improper discharges are occurring.

In general, because monitoring, treatment and disposal of contaminated groundwater is costly, anything that can be done, consistent with good construction and engineering practice, to reduce the duration of dewatering and the quantity of water produced will help hold construction costs down.

9.0 REFERENCES

- Woodward-Clyde Consultants, September 5, 1989, Environmental Site Assessment, City Center Garage II Parcel, Jefferson and 13th Streets, Oakland, California.
- --- November 1989, Hydrocarbon Assessment, City Center Garage II Parcel, Jefferson and 13th Streets, Oakland, California.
- --- February 12, 1990, Technical Specifications, Soil Excavation, Aeration and Disposal, City Center Garage II Parcel, Oakland, California.
- ---- December 17, 1990, Final Report, Geotechnical Engineering Study, City Center Garage West, Oakland, California.

Table 1. SUMMARY OF CHEMICAL ANALYSES OF SOIL CONTAINING GASOLINE 1, CITY CENTER GARAGE II

Pre-Aera	tion Soi	1 Samples					
Sample Number	TPH <sup>2</sup>	Benzene <sup>3</sup>	Toluene <sup>3</sup>	Ethyl <sup>3</sup> Benzene	Xylene <sup>3</sup>	Total Lead <sup>4</sup>	0il & Grease <sup>5</sup>
						<i>r</i> 0	ND.
DT-1	ND	ND	0.012	0.011	0.088	5.0	ND
DT-2	ND	ND	0.0075	0.005	0.042	7.6	ND
DT-3	24	ND	0.15	0.024	2.3	10	ND
DT-4	77	ND	ND	ND	ND		
DT-5	ND	ND	ND	ND	ND		
DT-6	61	0.0083	0.02	0.023	0.014		
DT-7	850	0.085	7.7	17	32		
DT-8	ND	ND	ND	ND	ND		
DT-9	ND	ND	ND	ND	ND		
DT-10	ND	ND	ND	ND	ND		
DT-11	ND	ND	ND	ND	ND		
DT-12	ND	0.019	0.015	ND	0.0081		
DT-13	71	0.034	0.15	0.17	0.8		
DT-14	390	0.15	0.45	0.83	3.1		
DT-15	55	ND	ND	0.0072	0.039		
DT-16	1000	0.8	3.2	4.1	12.0		
DT-17	27	ND	ND	0.0073	0.12		
DT-18	ND	ND	ND	ND	ND		
DT-19	ND	ND	ND	ND	ND		
DT-20	ND	ND	NĎ	ND	ND		
DT-21	ND	ND	ND	ND	ND		
DT-22	3.6	ND	ND	ND	ND		
DT-23	ND	ND	ND	ND	ND		
DT-24	110	0.093	0.110	0.065	0.28		
DT-25	ND	ND	ND	ND	ND		
CN-1	61	0.0074	0.110	0.42	0.84	14	ND
CN-2	ND	ND	ND	ND	ND	29	ND
CN-3	ND	ND	ND	ND	ND	7.1	ND
CN-4	ND	ND	ND	ND	ND	6.8	ND
CN-5	ND	ND	ND	ND	ND	6.4	
CN-6	ND	ND	ND	ND	ND	3.5	
	ND	ND	ND	ND	ND	5.9	
CN-7		ND ND	ND	ND	ND	2.3	
CN-8	ND ND	ND	ND	ND	ND ND	6.6	
CN-9			ND	9.8	ND	5.7	
CN-10	22 ND	ND ND		ND	ND	4.4	
CN-11	ND	ND	ND		ND ND	4.4	
CN-12	ND	ND	ND	ND ND			
CN-13	ND	ND	ND	ND ND	ND ND	3.8	
CN-14	ND	ND	ND	ND	ND		

Table 1. SUMMARY OF CHEMICAL ANALYSES OF SOIL CONTAINING GASOLINE<sup>1</sup>, CITY CENTER GARAGE II (Continued)

Pre-Aerati	on Soi	1 Samples			· · · · · · · · · · · · · · · · · · ·		
Sample Number	TPH <sup>2</sup>	Benzene <sup>3</sup>	Toluene <sup>3</sup>	Ethyl <sup>3</sup> Benzene	Xylene <sup>3</sup>	Total Lead <sup>4</sup>	Oil & Grease <sup>5</sup>
CN-15	ND	ND	ND	ND	ND		
CN-16	ND	ND	ND	ND	ND		
CN-17	ND	ND	ND	ND	ND		
CN-18	ND	ND	ND	ND	ND		
CN-19	3.2	ND	ND	ND	ND		
CN-20	ND	ND	ND	ND	ND		
CN-21	ND	ND	ND	ND	ND		
CN-22	ND	ND	ND	ND	ND		
CN-23	ND	ND	ND	ND	ND		
CN-24	ND	ND	ND	ND	ND		
CN-25	ND	ND	ND	ND	ND		
CN-26	ND	ND	ND	ND	ND		
CN-27	ND	ND	ND	ND	ND		
CN-28	ND	ND	ND	ND	ND		
CN-29	ND	ND	ND	ND	ND		<del></del>
CN-30	ND	ND	ND	ND	ND		
CN-31	ND	ND	ND	ND	ND		
CN-32	ND	ND	ND	ND	ND		
CN-33	ND	ND	ND	ND	ND		
SC-1	ND	ND	ND	ND	ND	6.99	
SC-2	ND	ND	ND	ND	ND	3.54	
SC-3	ND	ND	ND	ND	ND	7.14	
SC-4	ND	ND	ND	ND	ND	4.62	
SC-5	ND	ND	ND	ND	ND	3.62	<del></del>
detection limit	2.5	0.005	0.005	0.005	0.005	0.05	50

Table 1. SUMMARY OF CHEMICAL ANALYSES OF SOIL CONTAINING GASOLINE<sup>1</sup>, CITY CENTER GARAGE II (Continued)

Post-Aera	tion Soi	1 Samples		::::::::::::-			<u> </u>		<del></del>
Sample Number	TPH <sup>2</sup>	Benzene <sup>3</sup>	Toluene <sup>3</sup>	Ethyl <sup>3</sup> Benzene	Xy1ene <sup>3</sup>	Total <sup>4</sup> E: Lead	xtractable <sup>(</sup> Lead	5 Diesel <sup>7</sup>	Oil and <sup>5</sup> Grease
G1	ND	ND	ND	ND	ND				
G2	ND	ND	ND	ND	ND				
G3	ND	ND	ND	ND	ND			ND	ND
G4	ND	ND	ND	ND	ND			ND	ND
G5	ND	ND	ND	ND	ND				
G6	ND	ND	ND	ND	ND	ND			
G7	ND	ND	ND	ND	ND				
G8	ND	ND	ND	ND	ND				
G9	ND	ND	ND	ND	ND				
G10	ND	ND	ND	ND	ND				
G11	ND	ND	МĎ	ND	ND				
G12	ND	ND	ND	ND	ND				
G13	ПN	ND	ND	ND	ND				
G14	ND	ND	ND	ND	ND				<del></del>
G15	ND	ND	ND	ND	ND				
G16	ND	ND	ND	ND	ND				
G17	ND	ND	ND	ND	ND				
G18	ND	ND	ND	ND	ND				
G19	ND	ND	ND	ND	ND				
G20	ND	ND	ND	ND	ND				
G21	ND	ND	ND	ND	ND	3.46	ND		
G22	ND	ND	ND	ND	ND	3.77	ND		
G23	ND	ND	ND	ND	ND	11.8	ND		
G24	ND	ND	ND	ND	ND	6.77	ND		
G25	ND	ND	ND	ND	ND	3.51	ND		
G26	ND	ND	ND	ND	ND	3.67	ND		
G27	ND	ND	ND	ND	ND	3.08	0.27		
G28	ND	ND	ND	ND	ND	3.44	0.20		
G29	ND	ND	ND	ND	ND	4.47	ND		
G30	ND	ND	ND	ND	ND	4.24	ND		
G31	ND	ND	ND	ND	ND				
G32	ND	ND	ND	ND	ND				
G33	ND	ND	ND	ND	ND				
G34	ND	ND	ND	ND	ND				
G35	ND	ND	ND	ND	ND	6.06	ND		
G36	ND	ND	ND	ND	ND	5.33	ND		
G37	ND	ND	ND	ND	ND	5.47	ND		
G38	ND	ND	ND	ND	ND	5.60	ND		
G39	ND	ND	ND	ND	ND	4.35	ND		

Table 1. SUMMARY OF CHEMICAL ANALYSES OF SOIL CONTAINING GASOLINE<sup>1</sup>, CITY CENTER GARAGE II (Continued)

Post-Aera	tion Soi	1 Samples	<u> </u>		<del></del>	<del></del>		<del></del>	
Sample Number	TPH <sup>2</sup>	Benzene <sup>3</sup>	Toluene <sup>3</sup>	Ethyl <sup>3</sup> Benzene	Xylene <sup>3</sup>	Total <sup>4</sup> E: Lead	xtractable <sup>6</sup> Lead	Diesel <sup>7</sup>	0il and Grease
G40	ND	ND	ND	ND	ND	4.16	ND		
G41	ND	ND	ND	ND	ND	5.03	ND		
G42	ND	ND	ND	ND	ND	4.19	ND		
G43	ND	ND	ND	ND	ИD	7.19	ND		
G44	ND	ND	ND	ND	ND	5.70	ND		
G45	ND	ND	ND	ND	ND	6.21	ND		
G46	ND	ND	ND	ND	ND	4.67	ND		
G47	ND	ND	ND	ND	ИD	5.62	ND		
G48	ND	ND	ND	ND	ИD	4.19	ND		
G49	ND	ND	ND	ND	ПN	3.85	ND		
G50	ND	ND	ND	ND	CIA	5.45	0.51		
G51	ND	ND	ND	ND	СM	5.81	ND		
G52	ND	ND	ND	ND	ND	4.42	ND		
G53	ND	ND	ND	ND	ND	5.72	0.64		
G54	ND	ND	ND	ND	ND	5.57	0.51		
G55	ND	ND	ND	ND	ND	8.36	1.30		
G56	ND	ND	ND	ND	ND	9.87	ND		
G57	ND	ND	ND	ND	ND	5.12	ND		
G58	ND	ND	ND	ND	ND	4.42	ND		
G59	ND	ND	ND	ND	ND	10.22	0.78		
G60	ND	ND	ND	ND	ND	10.98	0.40		
G61	ND	ND	ND	ND	ND	12.85	0.63		
G62	ND	ND	ND	ND	ND	5.48	0.86		
G63	ND	ND	ND	ND	ND	7.06	0.72		
G64	ND	ND	ND	ND	ND	10.3	1.56		
G65	ND	ND	ND	ND	ND	7.40	0.42		
G66	ND	D	ND	ND	ND	5.19	1 <b>.8</b> 8		
G67	ND	ND	ND	ND	ND	6.16	0.68		
G68	ND	ND	ND	ND	ND	6.47	0.57		
G69	ND	ND	ND	ND	ND	6.79	0.29		
G70	ND	ND	ND	ND	ND	5.99	0.46		
G71	ND	ND	ND	ND	ND	<b>5.2</b> 3	0.31		
G72	ND	ND	ND	ND	ND	25.4	1.34		
G73	ND	ND	ND	ND	ND	6.01	1.02		
G74	ND	ND	ND	ND	ND	2.01	1.17		
G75	ND	ND	ND	ND	ND	3.88	0.88		

Table 1. SUMMARY OF CHEMICAL ANALYSES OF SOIL CONTAINING GASOLINE<sup>1</sup>, CITY CENTER GARAGE II (Continued)

Post-Aerati	on Soi	1 Samples	<del></del>		<u> </u>				
Sample Number	TPH <sup>2</sup>	Benzene <sup>3</sup>	Toluene <sup>3</sup>	Ethyl <sup>3</sup> Benzene	Xylene <sup>3</sup>	Total <sup>4</sup> E: Lead	xtractable <sup>6</sup> Lead	Diesel <sup>7</sup>	011 and Grease
G76	ND	ND	ND	ND	ND	6.71	1.00		
G77	ND	ND	ND	ND	ND	5.94	0.77		
G78	ND	ND	ND	ND	ND	7.01	0.64		
G79	ND	ND	ND	ND	ND	8.83	0.89		
G80	ND	ND	ND	ND	ND	5.38	0.77		
G81	ND	ND	ND	ND	ND	6.27	1.23		
G82	ND	ND	ND	ND	ND	8.00	0.90		
G83	ND	ND	ND	ND	ND	6.86	ND		
G84	ND	ND	ND	ND	ND	6.22	ND		
G85	ND	ND	ND	ND	ND	13.2	ND		
G86	ND	ND	ND	ND	ND	5.72	ND		
G87	ND	ND	ND	ND	ND	6.19	ND		
G88	ND	ND	ND	ND	ND	10.6	ND		
G89	ND	ND	ND	ND	ND	10.4	ND		
G90	ND	ND	ND	ND	ND	9.16	ND		
G91	ND	ND	ND	ND	ND	7.50	ND		
G92	ND	ND	ND	ND	ND	10.3	ND		
G93	ND	ND	ND	ND	ND	6.19	ND		
G94	ND	ND	ND	ND	ND	6.45	ND		
G95	ND	ND	ND	ND	ND	6.55	ND ND		
G96	ND	ND	ND	ND	ND	4.46	ND		
G97	ND	ND	ND	ND	CN	5.95	ND		
<b>G9</b> 8	ND	ND	ND	ND	CIA	6.54	ND		
G99	ND	ND	ND	ND	ND	5.95	ND		
G100	ND	ND	ND	ND	ND	3.19	ND		
G101	ND	ND	ND	ND	ND	5.48	ND		
G102	ND	ND	ND	ND	ND	8.05	ND		
G103	ND	ND	ND	ND	ND	5.10	ND		
G104	ND	ND	ND	ND	ND	ND	ND		
G105:1-4	ND	ND	ND	ND	ND	9.15	ND		
G105:5-8	ND	ND	ND	ND	ND	6.08	ND		
G105:9-12	ND	ND	ND	ND	ND	6.98	ND		
G105:13-16		ND	ND	ND	ND	7.96	ND		
G105:17-20		ND	ND	ND	ND	6.99	ND ND		
G105:21-24		ND	ND	ND	ND	10.9	ND		
G105:25-28		ND	ND	ND	ND	6.61	ND		
G105:29-32		ND	ND	ND	ND	7.36	ND		
G105:33-36		ND	ND	ND	ND	7.97	ND		
G105:37-40	ND	ND	ND	ND	ND	7 <b>.9</b> 9	ND		

Table 1. SUMMARY OF CHEMICAL ANALYSES OF SOIL CONTAINING GASOLINE 1, CITY CENTER GARAGE II (Continued)

Post-Aera	tion Soi	1 Samples	<del></del>				<del></del>	<del>:</del>	
Sample Number	TPH <sup>2</sup>	Benzene <sup>3</sup>	Toluene <sup>3</sup>	Ethyl <sup>3</sup> Benzene	Xy1ene <sup>3</sup>	Total <sup>4</sup> E Lead	xtractable <sup>6</sup> Lead	Diesel <sup>7</sup>	011 and Grease
G106	ND	ND	ND	ND	ND	8.45	ND		
G107	ND	ND	ND	ND	ND	9.52	ND		
G108	ND	ND	ND	ND	ND	7.46	ND		
G109	ND	ND	ND	ND	ND	9.75	ND		
G110	ND	ND	ND	ND	ND	5.92	ND		
G111	ND	ND	ND	ND	ND	8.41	ND		
G112	ND	ND	ND	ND	ND	8.12	ND		
G113	ND	ND	ND	ND	ND	8.20	ND		
G114	ND	ND	ND	ND	ND	8.05	ND		
G115	ND	ND	ND	ND	ND	6.86	ND		
G126	ND	ND	ND	ND	ND	6.18	ND		
G127	ND	ND	ND	ND	ND	6.16	ND		
G128	ND	ND	ND	ND	ND	6.21	ND		
G129	ND	ND	ND	ND	ND	6.18	ND		
G130	ND	ND	ND	ND	ND	10.3	ND		
G131	ND	ND	ND	ND	ND	9.11	ND		
G132	ND	ND	ND	ND	ND	9.60	ND		
G133	ND	ND	ND	ND	ND	41.0	0.36		
G134	ND	ND	ND	ND	ND	13.2	ND		
G135	ND	ND	ND	ND	ND	13.3	ND		
G136	ND	ND	ND	ND	ND	12.2	ND		
G137	ND	ND	ND	ND	ND	10.2	ND		
G138	ND	ND	ND	ND	ND	7.31	ND		
G139	ND	ND	ND	ND	ND	13.3	ND		
G140	ND	ND	ND	ND	ND	14.4	ND		
G141	ND	ND	ND	ND	ND	8.36	ND		
G142	ND	ND	ND	ИD	ND	11.6	ND		
G143	ND	ND	ND	ND	ND	13.6	ND	·· -	
G144	ND	ND	ND	ND	ND	11.4	1.26		
G145	ND	ND	ND	ND	ND	14.3	1.23		
G146	ND	ND	ND	ND	ND	13.4	1.35		
G147	ND	ND	ND	ND	ND	12.1	1.98		
G148	ND	ND	ND	ND	ND	12.0	1.13		
G149	ND	ND	ND	ND	ND	9.70	1.06		
G150	ND	ND	ND	ND	ND	9.63	0.94		
G151	ND	ND	ND	ND	ND	11.7	0.84		
G152	ND	ND	ND	ND	ND	11.3	0.66		
<b>G</b> 153	ND	ND	ND	ND	ND	10.6	0.32		
G154	ND	ND	ND	ND	ND	15.6	0.44		

Table 1. SUMMARY OF CHEMICAL ANALYSES OF SOIL CONTAINING GASOLINE<sup>1</sup>, CITY CENTER GARAGE II (Continued)

Post-Aerat	ion Soi	1 Samples			***************************************			+ - · · · · · · · · · · · · · · · · · ·	
Sample Number	TPH <sup>2</sup>	Benzene <sup>3</sup>	To luene <sup>3</sup>	Ethyl <sup>3</sup> Benzene	Xy1ene <sup>3</sup>	Tota1 <sup>4</sup> E: Lead	ktractable Lead	<sub>e</sub> 6 Diese1 <sup>7</sup>	0il and <sup>5</sup> Grease
G155	ND	ND	ND	ND	ND	13.4	0.67	<b>-</b>	
G156	ND	ND	ND	ND	ND	33.6	1.22		
G157	ND	ND	ND	ND	ND	12.2	1.00		
G158	ND	ND	ND	ND	ND	10.6	0.86		
G159	ND	ND	ND	ND	ND	10.8	1.31		
G160	ND	ND	ND	ND	ND	8.70	1.18		
G161	ND	ND	ND	ND	ND	9.25	0.66		
G162	ND	ND	ND	ND	ND	3.95	ND		
G163	ND	ND	ND	ND	ND	4.69	0.44		
G164	ND	ND	ND	ND	ND	12.2	ND		<del></del>
G165	ND	ND	ND	ND	ND	22.9	0.12		
G166	ND	ND	ND	ND	ND	19.3	0.18		
G167	ND	ND	ND	ND	ND	14.8	0.12		
G168	ND	ND	ND	ND	ND	14.5	0.11		
G169	ND	ND	ND	ND	ND	14.6	0.10		
G170	ND	ND	ND	ND	ND	10.5	0.27		
G171	ND	ND	ND	ND	ND	15.1	0.12		
G172	ND	ND	ND	ND	ND	27.9	0.14		
G173	ND	ND	ND	ND	ND	15.9	0.14		
G174	ND	ND	ND	ND	ND	15.0	0.39		
G175	ND	ND	ND	ND	ND	14.6	0.39		
G176	ND	ND	ND	ND	ND	8.57	0.19		
G177	ND	ND	ND	ND	ND	5.04	0.16		
G178	ND	ND	ND	ND	ND	4.63	0.19		
G179	ND	ND	ND	ND	ND	4.47	0.16		
G180	ND	ND	ND	ND	ND	4.39	0.13		
G181	ND	ND	ND	ND	ND	4.77	0.16		
G182	ND	ND	ND	ND	ND	7.14	0.19		
G183	ND	ND	ND	ND	ND	5.04	0.13		
G184	ND	ND	ND	ND	ND	8 <b>.9</b> 6	0.30		
detection limit	2.5	0.005	0.005	0.005	0.005	0.05	0.10	5	50

Table 1. SUMMARY OF CHEMICAL ANALYSES OF SOIL CONTAINING GASOLINE<sup>1</sup>, CITY CENTER GARAGE II (Continued)

- $^1$  All results reported as parts-per-million (ppm), dashed where no analysis performed, ND=not detected
- <sup>2</sup> TPH = Total Petroleum Hydrocarbons, analyzed by EPA Method 8015, Modified
- <sup>3</sup> Analyzed by EPA Method 8020
- <sup>4</sup> Analyzed by EPA Method 3050/7420, TTLC=1000 PPM
- <sup>5</sup> Analyzed by EPA Method 503 D&E
- 6 Analyzed by EPA Method 3010/7420, extracted as per California Assessment Manual Title 22 Waste Extraction Test (WET), STLC=5 ppm
- 7 Analyzed by EPA Method 3500/8015

Table 2. SUMMARY OF CHEMICAL ANALYSES OF FILL  $^1$  CITY CENTER GARAGE II (Continued)

## Samples from Soil Borings

Sample Number	Depth (feet)	Oil and <sup>5</sup> Grease	Total <sup>4</sup> Lead	Extractable <sup>6</sup> Lead
FL6-1	4	87	48.4	net mill
FL7-1	4	ND	2.56	
FL8-1	4	ND	2.78	<del></del>
FL9-1	4	ND 110	2.90 411	<b></b>
F1-1 F1-2	2 4	ND	36.6	
F2-1	1	ND	837	
F2-2	1 3 5 2	ND	43.9	-u <del>-</del>
F2-3	5	ND	3.0	
F3-1	2	ND	3.05	
F3-2	4	ND	2.77	
F4-1		55	51.1	
F4-2	1 3 5 2	55	26.2	-u-
F4-3	5	55	4.12	-40 📟
F5-1	2	ND	4.23	
F5-2	4	ND 82	14.0 5.53	
F6-1 F6-2		ND	10.9	***
F6-3	1 3 5 1 3 5 2 4	ND ND	13.4	ner har
F7-1	1	110	149	
F7-2	3	110	46.1	
F7-3	5	69	142	
F8-1	2	120	2630	
F8-2		ND	6.16	w <b>-</b>
F9-1	1 3 5 2	ND	5.60	-10 to
F9-2	3	ND	12.5	
F9-3	5	ND	2.48	<del></del>
F10-1	2	ND	24.2	440 <del>-                                  </del>
F10-2 F11-1	4 1 3 5 2	ND 52	2.81 15.5	<b></b>
F11-1 F11-2	3 T	ND	3.41	
F11-2	5 5	ND ND	3.14	
F12-1	ž	100	16.7	<b></b>
F12-2	4	ND	3.15	<b></b>
F13-1	2	250	30.7	<del></del>
F13-2	4	65	35.9	
F14-1	1	ND	276	-
F14-2	1 3 5	ND	2.76	
F14-3	5	ND	2.05	<del>-</del>
F15-1	2	ND	241	
F15-2	4	ND	2.86	

Table 2. SUMMARY OF CHEMICAL ANALYSES OF FILL  $^1$  CITY CENTER GARAGE II (Continued)

## Samples from Soil Borings

Sample Number	Depth (feet)	0il and <sup>5</sup> Grease	Total <sup>4</sup> Lead	Extractable <sup>6</sup> Lead
F16-1	1	ND	3.20	
F16-2	1 3 5	ND	2.49	<del></del>
F16-3	5	ND	2.70	
F17-1	2	ND	31.2	
F17-2	4	ND	2.90	nage spen
F18-1	1	ND	2.88	·
F18-2	3 5 1	ND	3.14	<del></del>
F18-3	5	160	5.38	<b></b>
F19-1	1	59	62.2	units units
F19-2	3 5 2	ND	4.97	-en-sie
F19-3	5	ND	9.81	-44- <del></del>
F20-1		ND	212	<b>→</b> <del>-</del>
F20-2	4	ND	3.12	<del></del>
F21-1	1	69	2540	<del></del>
F21-2	3	ND	4.34	<del></del>
F21-3	1 3 5 2	ND	2.53	<del></del>
F22-1		ND	3.58	<del> =</del>
F22-2	4	ND	3.02	
F23-1	1	420	423	
F23-2	3	ND	4.17	ngan night
F23-3	5	ND	3.16	
F24-1	2	ND	3.02	***
F24-2	4	ND	3.20	
F25-1	1 3 5 2	ND	3.46	
F25-2	3	ND	2.65	
F25-3	5	ND	3.87	
F26-1		ND	3.41	Apple Apple
F26-2	4	ND	3.80	
F27-1	1 3	ND	56.4	<del></del>
F27-2	<u>ა</u>	ND ND	2.76	- <del></del>
F27-3	5 2	ND	3.28	<del></del>
F28-1		ND ND	2.48	
F28-2	4	ND ND	2.70	<del>-</del>
F29-1	1	ND ND	91.5	<del></del>
F29-2	1 3 5 2 4	ND ND	3.02 3.11	₩ 🖘
F29-3	5		3.11 2.01	
F30-1	<u> </u>	ND ND	3.81 2.59	
F30-2 F31-1	<del>4</del> 1	ND	5.69	
F31-1 F31-2	1 3	ND	2.76	
F31-2 F31-3	5 5	ND ND	2.47	
1.21-2	Ş	שוּו	4.41	<b></b>

Table 2. SUMMARY OF CHEMICAL ANALYSES OF FILL  $^1$  CITY CENTER GARAGE II (Continued)

## Samples from Soil Borings

Sample Number	Depth (feet)	0il and <sup>5</sup> Grease	Total <sup>4</sup> Lead	Extractable <sup>6</sup> Lead
F32-1	2	ND	50.4	cèn dèn
F32-2	4	ND	3.49	
F33-1	1	ND	2.50	
F33-2	3	ND	2.74	
F33-3	5 2 4	ND	4.36	
F34-1	2	ND	3.56	
F34-2		ND	4.49	
F35-1	1	4800	84.3	
F35-2	1 3 5 2	ND	811	<del></del>
F35-3	5	ND	3.13	
F36-1	2	ND	10.0	
F36-2	4	ND	4.24	
F37-1	1	ND	147	
F37-2	3	ND	2.94	
F37-3	5	ND	3.08	
F38-1	2	74	54.6	
F38-2	4	ND	2.70	
F39-1	1	ND	3.69	
F39-2	3 5	ND	3.01	
F39-3	5	ND	2.71	<b></b>
F40-1	2	ND	3.00	
F40-2	4	ND	2.76	
F41-1	1	ND	5.24	rate water
F41-2	3	ND	2.59	140 644
F41-3	5 2	ND	4.62	<del></del>
F42-1	2	ND	2.77	
F42-2	4	ND	4.17	
F43-1	1	ND	3.35	
F43-2	3	ND	3.02	
F43-3	5	ND	4.85	( <del>**</del> 1**
F44-1	2	ND	2.48	
F44-2	4	ND	3.35	· <del>-</del>
F45-1	1	ND	4.93	
F45-2	3	ND	2.61	<del>-</del>
F45-3	5	ND	3.78	

Table 2. SUMMARY OF CHEMICAL ANALYSES OF FILL  $^1$  CITY CENTER GARAGE II (Continued)

## Samples from Fill Hotspots

Sample Number	Oil and <sup>5</sup> Grease	Total <sup>4</sup> Lead	Extractable <sup>6</sup> Lead
SF-1	N.D.	3.45	***
SF-2	N.D.	3.80	·
SF-3	N.D.	3.08	<b>→</b> <del>=</del>
SF-4	N.D.	2.99	
SF-5	N.D.	2.75	<b></b>
SF-6	N.D.	2.68	
SF-7	N.D.	4.50	<b></b>
SF-8	N.D.	44.8	8.60
SF-9	N.D.	3.13	two silve
SF-10	N.D.	2.58	
SF-11	N.D.	3.45	
SF-12	N.D.	3.69	
SF-13	230	30.0	3.50
SF-14	N.D.	393	<del>-</del>
SF-15	71	368	No.
SF-16	53	600	App - 10A
SF-17	N.D.	385	***
SF-18	N.D.	3.36	
SF-19	N.D.	19.4	N.D.
SF-20	N.D.	3.08	
SF-21	N.D.	3.37	
SF-22	N.D.	2.79	<b></b>
SF-23	N.D.	16.2	N.D.
SF-24	N.D.	44.2	4.90
SF-25	N.D.	31.1	N.D.
SF-26	N.D.	22.4	0.28
SF-27	N.D.	52.9	3.69
SF-28	N.D.	49.6	3.29
SF-29	N.D.	70.8	11.0
SF-30	N.D.	42.1	1.22
SF-31	N.D.	48.6	4.03
SF-32	N.D.	15.4	8.34
SF-33	N.D.	5.70	
SF-34	N.D.	2.64	
SF-35	N.D.	9.47	
SF-36	N.D.	72.5	12.8
SF-37	N.D.	1.72	12.0
SF-38	N.D.	4.16	
SF-39	N.D.	3.59	
SF-40	N.D.	3.01	

Table 2. SUMMARY OF CHEMICAL ANALYSES OF FILL  $^1$  CITY CENTER GARAGE II (Continued)

## Samples from Test Pits

Sample Number	Oil <b>an</b> d <sup>5</sup> Gr <b>ea</b> se	Total <sup>4</sup> Lead	Extractable <sup>6</sup> Lead
TP1-1	N.D.	2.37	
TP1-2	N.D.	3.16	100 100
TP1-3	N.D.	2.33	ngar njuk
TP2-1	N.D.	694	
TP2-2	N.D.	2.43	<b></b>
TP2-3	N.D.	2.08	140 000
TP2-4	N.D.	4.05	ndr -174
TP3-1	N.D.	2.87	40-44
TP3-2	N.D.	1.99	
TP3-3	N.D.	2.53	<del></del>
TP4-1	N.D.	169	<del></del>
TP4-2	N.D.	2.41	the The
Samples from S	tockpiles		
<b>Z1</b>	N.D.	84.0	·
Z2	N.D.	94.8	<del></del>
Z3	N.D.	37.7	
<b>Z</b> 4	54	24.0	
Z5	N.D.	48.8	
Detection Limit	50	0.05	0.10

Table 2. SUMMARY OF CHEMICAL ANALYSES OF FILL<sup>1</sup> CITY CENTER GARAGE II

METALS, total - CAM 17

	Detection Limit	Fi1	FL-4	F1-6	TTLC <sup>7</sup>
Antimony	20	ND	ND	ND	500
Arsenic	0.5	1.1	8.1	7.9	500
Barium	5	88	57	51	10,000
Beryllium	5 5 5	ND	ND	ND	75
Cadium	5	ND	ND	ND	100
Chromium (VI)	0.5	NA	NA	NA	500
Chromium	5	36	32	30	2,500
Cobalt	5 5	1.0	11	ND	8,000
Copper	5	20	14	12	2,500
Lead	20	96	77	46	1,000
Mercury	0.05	0.11	0.40	0.08	20
Molybdenum	10	ND	ND	ND	3,500
Nickel	5	22	17	19	2,000
Selenium	0.5	ND	ND	ND	100
Silver	2	ND	ND	ND	500
Thallium	30	ND	ND	ND	700
Vanadium	5	29	22	23	2,400
Zinc	5 5	110	64	52	5,000

All results reported as parts-per-million (ppm), dashed where no analysis performed, ND = not detected

TPH = Total Petroleum Hydrocarbons, analyzed by EPA Method 8015, Modified

Analyzed by EPA Method 8020

<sup>4</sup> Analyzed by EPA Method 3050/7420, TTLC = 1000 PPM

<sup>5</sup> Analyzed by EPA Method 503 D&E

Analyzed by EPA Method 3010/7420, extracted as per California Assessment Manual Title 22 Waste Extraction Test (WET), STLC = 5 ppm

<sup>7</sup> TTLC = Total Threshold Limit Concentration

Table 3. SUMMARY OF CHEMICAL ANALYSES OF SOIL SAMPLES FROM BOTTOM OF GASOLINE EXCAVATION, CITY CENTER GARAGE II

Sample Number	TPH <sup>2</sup>	Benzene <sup>3</sup>	To luene <sup>3</sup>	Ethyl <sup>3</sup> Benzene	Xylene <sup>3</sup>
BTM1	ND	0.0054	ND	ND	ND
BTM2	38	0.024	0.0062	0.016	0.3
BTM3	47	0.37	0.18	0.17	0.46
BTM4	ΝD	ND	ND	ND	ND
BTM5	45	0.33	0.096	0.032	0.39
BTM6	ND	0.075	0.04	ND	0.033
BTM7	21	0.39	0.43	0.18	0.4
BTM8	ND	ND	ND	ND	ND
BTM9	ND	0.032	0.0051	ND_	0.005
MLK1	890	3.5	10.0	7.5	14.0
MLK2	ND	ND	ND	ND	ND
12TH1	ND	ND	ND	ND	ND
12TH2	ND	ND	ND	ND	ND
WALL1	ND	ND	ND	ND	ND
WALL2	ND	ND	ND	ND	ND
WALL3	ND	ND	ND	ND	ND
B-1	320	ND	ND	ND	4.9
B-2	1.5	ND	ND	ND	0.015
B-3	ND	ND	ND	ND	ND
B-4	1800	ND	ND	ND	64
B-5	6900	ND	ND	ND	19
B-6	ND	ND	ND	ND	ND
B-7	ND	ND	ND	ND	ND
B-8	ND	ND	ND	ND	ND 0.017
B-9	11	ND	ND	ND	0.017
F-1	ND	ND	ND	ND	ND
F-2	ND	ND	ND	ND	ND
F-3	ND	ND	ND	ND	ND
<u>Prelimina</u>	ry Closure So	il Samples			
1	ND	ND	ND	ND	ND
2 3	6.8	0.025	0.012	ND	0.067
3	ND	ND	ND	ND	ND
4	ND	ND	ND	ND	ND
5	ND	ND	ND	ND	ND

Table 3. SUMMARY OF CHEMICAL ANALYSES OF SOIL SAMPLES FROM BOTTOM OF GASOLINE EXCAVATION, CITY CENTER GARAGE II (Continued)

Sample Number	TPH <sup>2</sup>	Benzene <sup>3</sup>	To1uene <sup>3</sup>	Ethyl <sup>3</sup> Benzene	Xylene <sup>3</sup>
6	ND	ND	ND	ND	ND
7	ND	ND	ND	ND ND	ND ND
8 Final Closu	ND re Soil Sam	ND uples	ND	ND	140
9 10	ND ND	NO ND	ND ND	ND ND	ND ND
Detection Limit	2.5	0.005	0.005	0.005	0.005

 $<sup>^{1}</sup>$  All results reported as parts-per-million (ppm), dashed where no analysis performed, ND=not detected  $\,$ 

 $<sup>^2</sup>$  TPH = Total Petroleum Hydrocarbons, analyzed by EPA Method 8015, Modified

 $<sup>^{3}</sup>$  Analyzed by EPA Method 8020

Table 4. SUMMARY OF CHEMICAL ANALYSIS OF GROUNDWATER SAMPLES,  $^1$  CITY CENTER GARAGE II

	GW1	GW2	Detection <sup>4</sup> Limit	STLC Limits (mg/1)
TPH-Gasoline <sup>2</sup> Benzene <sup>3</sup> Toluene <sup>3</sup> Ethylbenzene <sup>3</sup> Xylenes <sup>3</sup>	0.14 0.0007 0.0054 0.0029 0.057	0.84 0.008 0.110 0.046 0.430	0.05	
Antimony Arsenic Barium Beryllium Cadmium Chromium Cobalt Copper Lead* Mercury Molybdenum* Nickel* Selenium* Silver Thallium*	0.27 0.005 0.22 ND 0.02 0.17 ND 0.02 ND 0.0006 ND 0.12 ND	0.48 0.007 0.66 ND 0.06 0.49 0.18 0.07 0.07 0.07 0.004 ND 0.26 ND 0.04	0.05 0.001 0.05 0.007 0.02 0.02 0.05 0.01 0.05 0.002 0.02 0.03 0.05 0.05 0.02	15 5.0 100 0.75 1.0 560 80 25 5.0 0.2 350 20 1.0 5
Vanadium* Zinc	0.09 0.14	0.16 0.27	0.01 0.05	24 250

All results imported as parts-per-million (ppm), dashed where no analysis performed, ND=not detected.

<sup>&</sup>lt;sup>2</sup> TPH=Total Petroleum Hydrocarbons, analyzed by EPA Method 8015, Modified.

<sup>3</sup> Analyzed by EPA Method 8020.

The detection limit for BTEX for samples: GW1 = 0.0005 ppm, GW2 = 0.005 ppm

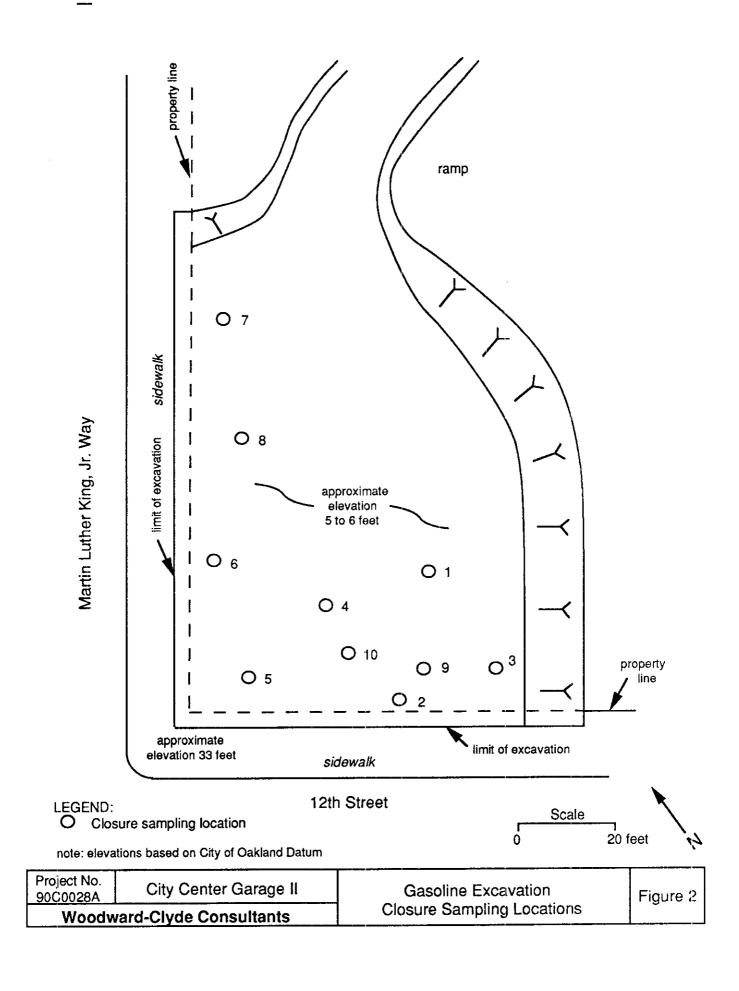
TABLE 5. SUMMARY OF CHEMICAL ANALYSES OF CLOSURE SAMPLES IN FILL EXCAVATED AREA<sup>1</sup>, CITY CENTER GARAGE II

Oil and Grease Total <sup>2</sup>	Oil and Grease Non-Polar3	Total Lead <sup>4</sup>
(ppm)	(ppm)	(ppm)
N.D. 76 N.D. N.D. N.D. N.D. N.D. N.D. N.D. N.D	N.D. N.D. N.D. N.D. N.D. N.D. N.D. N.D.	2.2 2.8 1.3 1.8 1.5 2.3 1.7 2.5 2.6 4.7 2.4 1.7 2.0 2.1 2.4 1.8 1.8
es, composited fro	m depths of 3 feet and 5	feet
N.D. N.D. N.D. N.D. N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D. N.D. N.D. N.D. N.D.	1.7 2.0 2.5 2.4 2.4 1.8 1.8 1.7 1.7 1.7 1.2
	Grease, Total <sup>2</sup> (ppm)  N.D. 76 N.D. N.D. N.D. N.D. N.D. N.D. N.D. N.D	Grease, Total   Z

TABLE 5. SUMMARY OF CHEMICAL ANALYSES OF CLOSURE SAMPLES IN FILL EXCAVATED AREA<sup>1</sup>, CITY CENTER GARAGE II (Continued)

Sample No.	Oil and Grease, Total <sup>2</sup> (ppm)	Oil and Grease, Non-Polar <sup>3</sup> (ppm)	Total Lead <sup>4</sup> (ppm)
C-17bc C-18bc C-19bc C-20bc	N.D. 50 50 N.D.	N.D. N.D. N.D. N.D.	1.3 1.8 1.6 1.5
Detection Limit Second Round,	50	100	0.2
C-2a C-17a C-4bc C-11bc C-18bc C-19bc	   	88 N.D. N.D. N.D. N.D.	   
Detection Limit		50	upo dos

- 1. All results reported as parts-per-million (ppm), dashed where no analysis performed, ND = not detected.
- 2. Analyzed by EPA Method 9071.
- 3. Analyzed by EPA Method 503 D/E.
- 4. Analyzed by EPA Method 7421.



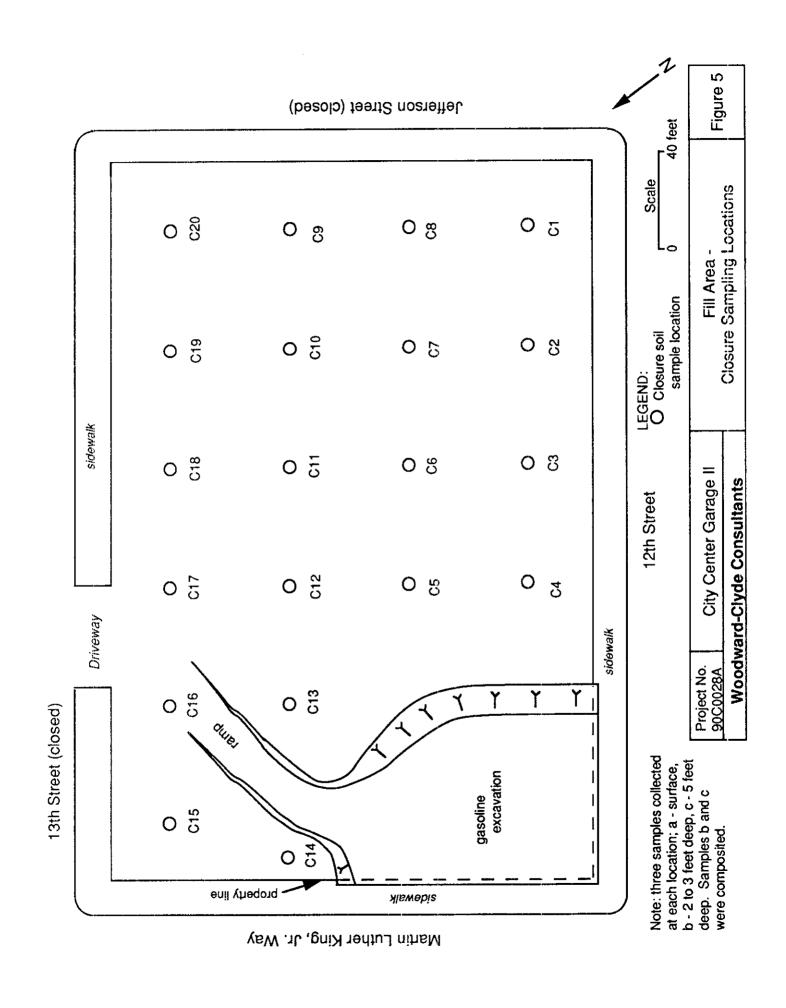
aeration area

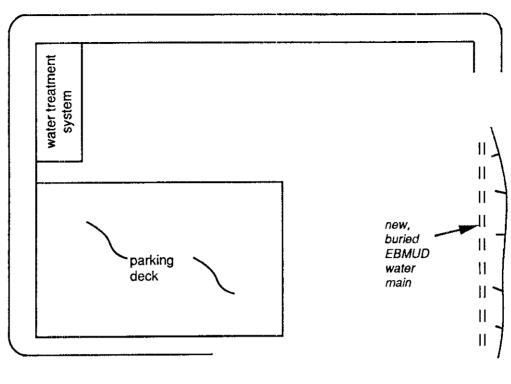
Jefferson Street

Martin Luther King, Jr. Way

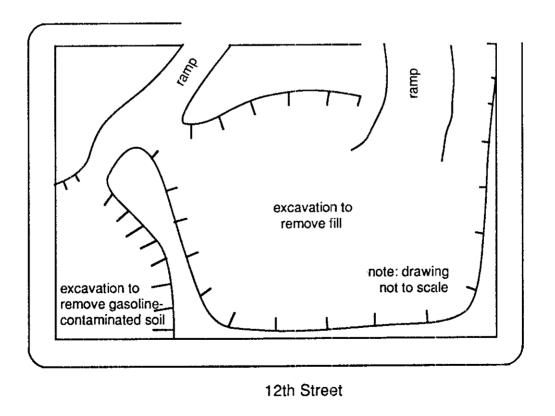
12th Street

Project No. 90C0028A	City Center Garage II	Typical Locations of	Figure 3
	ward-Clyde Consultants	Stockpiles and Aeration Areas	





13th Street (closed)



Jefferson Street (closed)

Project No. 90C0028A	City Center Garage II	End-of-Project	Figure 6
Woodw	ard-Ciyde Consultants	Conditions	

												<u> </u>
BORIN	G NUMI	FL1				<u> </u>	VATION		DA IC	лм ———		
DRILLI	NG AG	Sierra Pacific Exploration	DRILLER	Phil / Ted		DA.	TE STAF TE FINIS	RTED		Jun	e 1,	1990
DRILLI	NG EQI	JIPMENT Mobile B-53				CO	MPLETIC PTH	N	9.1	0'		SAMPLER 2" Modified California Type
DRILL	ING ME		DRILL BIT			NO.	OF MPLES	DIST	·	VA		UNDIST. 2
SIZE A	ND TYP	E OF CASING NA					TER	FIRS	Ť	NA		COMPL. NA 24 HRS. NA
TYPE (	OF PERI	FORATION NA	FROM	то	Ft.	-	GGED E	3Y:				CHECKED BY:
SIZE A	ND TYP	PE OF PACK NA	FROM	то	Ft.		٧	/. Cop	oelan	ıd		G. Ford
TYPE		NO.1 NA	FROM	то	FL.							
SE	AL	NO. 2 NA	FROM	то	Ft.							
		<u> </u>	<u> </u>			<u> </u>			SAMP	LES		REMARKS
DEPTH (feet)		DES	CRIPTION				DEPTH (feet)	Drive Number	Sample	Recov. (Feet.)	Blow	(Drill Rate, Fluid Loss, Odor, etc.)
	aşp	haltic concrete + gravel base				<del></del> -		02	0,2		╁	
	SIL	TY SAND (SM) ack, dry, pieces of brick, gravel to	411 -lt 45	-11. ( )								
4	DI	ack, dry, pieces of brick, gravel to	1" diameter (r	·ILL)				4				
4								1			ļ	
5 —							5 -	1	1		三	
_								_				
-		MINISTER STATE OF THE STATE OF						2	<b></b>		$\equiv$	
10-	SIL	TY SAND (SM) reddish brown, some clay, damp	(NATIVE SOIL)	wat on the first to the first t		_/	10-	_	2	(111)	1	
	E	3ottom of Boring - 9 feet						1				
								1				
4								-				
15 -							15-	-				
4								1				
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35_			<u>.                                    </u>				35 _	<u> </u>		<u> </u>		

		ra-Oryac Ooristitatits				JEC 1 N	IAME .	<u> </u>	0011	. O. C	auru	<u> 18 11</u> NO. <u>9000</u>	<u> </u>
BORIN	IG NUM	BER FL2				ELEV	/ATION	AND	DATU	JM			
DRILL	ING AGI	Sierra Pacific Exploration	DRILLER	Phil / Ted		DATI	STAF	HED		Jun	e 1,	1990	
DRILL	ING EQI	DIPMENT Mobile B-53				COM	PLETIC TH	ON	6.	0'		SAMPLER 2" M Californ	lodified nia Type
DRILL	ING ME	THOD 8" Hollow Stem Auger	DRILL BIT			NO. (	OF PLES	DIST	.	NA		undist. 2	
SIZE A	ND TYP	PE OF CASING NA				WAT	ER L	FIRS	T	NA		COMPL. NA 24 H	IRS. NA
TYPE	OF PERI	FORATION NA	FROM	то	Ft.	LOG	GED E	Y:				CHECKED BY:	
SIZE A	ND TYP	PE OF PACK NA	FROM	то	PL.		W	. Cop	elan	nd		G. Ford	
TYPE	OF	NO.1 NA	FROM	то	PL								
SE	AL	NO. 2 NA	FROM	то	FL								
_									SAMP			REMARKS (Drill Rate, Fluid Lo	ss. Odar.
DEPTH (feet)		DESCF	RIPTION				EPTH eet)	Drive Number	ample	feet.)	Blow	etc.)	,,
	asp	ha <u>łtic concrete</u> + <u>gr</u> av <u>el base</u>						<u>oz</u>	yz		- 3		
	SIL	TY SAND (SM) ack, dry, pieces of brick (FILL)						1					
_							.	ļ	ļ				
-	be	ecomes gray brown, no debris					-	1.	1				
5 —	CI	AVEV CAND (CC)					5 -	2	2				
	,	AYEY SAND (SC) nottled reddish brown and gray, som	e silt, moist	(NATIVE SC	DIL)	_/	1 .						
-		Bottom of Boring - 6 feet					-	-					
-		,					-	1					
10 —							10 -	1					
_								-					
-							-	-					
15							15 -	1					
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											ala	ge II NO. 9000028A
BORII	NG NUM	BER FL3					/ATION		DATL	JM		
DRILL	ING AG	Sierra Pacific Exploration	DRILLER	Phil / Ted		DATE	E STAR E FINIS	TED HED		Jun	e 1,	1990
DRILL	ING EQ	UIPMENT Mobile B-53				COM	PLETIC	N	11	.0'		SAMPLER 2" Modified California Type
DRILL	LING ME	8" Hollow Stem Auger	DRILL BIT			NO. C	OF PLES	DIST	٠ ١	VA.		UNDIST. 2
SIZE	AND TY	PE OF CASING NA	•			WAT	ER	FIRS	T	NA	•	COMPL. NA 24 HRS. NA
TYPE	OF PER	FORATION NA	FROM	то	Ft.	1	GED B	Y:				CHECKED BY:
SIZE	AND TY	PE OF PACK NA	FROM	το	Ft.		W	. Cop	oelan	ıd		G. Ford
TYP	E OF	NO.1 NA	FROM	то	Ft.							
SE	AL	NO. 2 NA	FROM	то	Ft.							
			<del> </del>				Τ		SAMP	Ţ	·····	REMARKS
DEPTH (feet)		DESC	RIPTION				DEPTH (feet)	Drive Number	Sample Number	Recov. (Feet.)	Blow Counts	(Drill Rate, Fluid Loss, Odor, etc.)
_	asr	phal <u>tic concrete</u> + <u>gravel base</u>			- —		-					
_	SIL	TY SAND (SM) ray brown, dry, pieces of brick (FIL	L <b>)</b>				-	<u> </u>				
-	- T	ecomes clayey	-,				-	1	1	777		
5 -		ecreasing clay					5 —	<u> </u>	<u> </u>	777		
	- I	oreasing day					-	2	2			
_	be	ecomes gray with black spots, wood	fragments				-	3				
-	be	ecomes saturated						<u> </u>	3	777		
10 —							10 —	4				
-	SIL	TY SAND (SM)	domo (NIATI	VE COIL			] -	5	4			
-	\ \ <u>\</u>	reddish brown, some gray mottling,	Jamp (NATI	VE SOIL)		_/	-					
_	]	Bottom of Boring - 11 feet										• •
15 —							15 -	-				
	-						-	-	1			
_	1						-	1				
_							-					
20							20 —	-				
-	1						-					
_	1											
_							_					
25 —							25—					
-							-					
_												
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**ELEVATION AND DATUM** BORING NUMBER FL4 DATE STARTED DATE FINISHED DRILLER DRILLING AGENCY Phil / Ted June 1, 1990 Sierra Pacific Exploration DRILLING EQUIPMENT COMPLETION SAMPLER 2" Modified 6.0' Mobile B-53 California Type DEPTH DRILLING METHOD **DRILL BIT** NO. OF DIST. UNDIST. NA 8" Hollow Stem Auger SAMPLES COMPL. NA 24 HRS. NA SIZE AND TYPE OF CASING WATER FIRST NA NA LEVEL TYPE OF PERFORATION FROM Ft, NA 10 LOGGED BY: CHECKED BY: SIZE AND TYPE OF PACK NA FROM TO Pt. W. Copeland G. Ford FROM то Ft. NO. 1 NA TYPE OF FROM TO Pt. NO. 2 NA SAMPLES REMARKS (Drill Rate, Fluid Loss, Odor, DEPTH (feet) DESCRIPTION etc.) asphaltic concrete + gravel base SILTY SAND (SM) brown, dry, pieces of brick (FILL) becomes black becomes red (brick fragments) becomes dark brown 5 5 CLAYEY SAND (SC) mottled reddish brown and gray, some silt, damp (NATIVE SOIL) Bottom of Boring - 6 feet 10 10 15 15 20 20 25 30

		ra orgao oomoanamo		<del>//</del>				<u> </u>				ge ii NO. 30C0020A
BORIN	IG NUMI	BER FL5				ELE	VATION	AND	DATL	JM		
	ING AGI	Sierra Facilic Exploration	DRILLER	Phil / Ted		DAT	E STAF	HED		Jun	e 1,	1990
DRILL	NG EQI	JIPMENT Mobile B-53				CON	APLETK TH	N	6.	0,		SAMPLER 2" Modified California Type
DRILL	ING ME	THOD 8" Hollow Stem Auger	DRILL BIT			NO.	OF IPLES	DIST	٠ ١	NA		UNDIST. 2
SIZE A	ND TYP	PE OF CASING NA				WA.	TER	FIRS	T	NA		COMPL. NA 24 HRS. NA
TYPE	OF PERF	FORATION NA	FROM	то	FL	7	GGED E	Y:				CHECKED BY:
SIZE A	ND TYP	PE OF PACK NA	FROM	ŤO	Ft.	]	W	. Cop	elan	nd		G. Ford
TYPE		NO. 1 NA	FROM	то	Ft.	1						
SE	AL	NO. 2 NA	FROM	то	Ft.							
_									SAMP			REMARKS (Drill Rate, Fluid Loss, Odor,
DEPTH (feet)		DESCF	IPTION				DEPTH (feet)	Drive Number	Sample	Recov. (Feet.)	Blow	etc.)
	asp	hal <u>tic concrete</u> + <u>gr</u> av <u>el başe</u>	<del></del>				Ϊ.		9,2		Ť	
_	SILT	TY SAND (SM) ack, dry, pieces of brick (FILL)						4				
-	U	ack, dry, preces or brick (FILL)						-				
-	SILT	TY SAND (SM)					┨ .	1	1	////	-	
5 —	m	ottled reddish brown and gray, some	silt, damp	(NATIVE SOI	iL)		5 -	2	2			
_	Во	ttom of Boring - 6 feet					.	-				
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BORIN	G NUME	ER FLE	3					ELEVA	TION	AND	DATU	M		
	ING AGE	Siena	ı Pacific Explorat	ion DRILLEI	R Phil/Te	ed		DATE :	FINIS	HED		June	e 1,	1990
DRILLI	ING EQU	IPMENT Mo	obile B-53					COMPI DEPTH	LETIC	N	6.0	)' 		SAMPLER 2" Modified California Type
DRILL	ING MET	HOD 8" H	lollow Stem Auge	er DRILL B	IT			NO. OF	ES	DIST	. 1	٧A		undist. 2
SIZE A	ND TYPI	E OF CASING	NA			·	[1	WATER LEVEL	3	FIRS	T	NA		COMPL. NA 24 HRS. NA
TYPE (	OF PERF	ORATION	NA	FROM	to	Ft.		LOGG	ED B	Y:				CHECKED BY:
SIZE A	ND TYP	E OF PACK	NA	FROM	10	Ft.			W	. Сор	elan	đ	į	G. Ford
TYPE SE		NO. 1 NA		FROM	то	Ft.								
31		NO. 2 NA		FROM	то	Ft.				<del>,</del> .				
I											SAMPI	,—		REMARKS (Drill Rate, Fluid Loss, Odor,
DEPTH (feet)			Di	ESCRIPTION					DEPTH (feet)	Drive Number	Sampk	Recov. (Feet.)	Blow	etc.}
_	aspl	na <u>ltic</u> concre <u>te</u>	+ gravel base				_		_					
_	SILT da	Y SAND (SM) rk brown, drv.	) pieces of brick	(FILL)					-	-				
4									-	1	1			
5 —	CLA	YEY SAND (S	SC)						5 —			,,,,		
	m	ottled reddish i	brown and gray,	some siit, dam	P (NATIVE	SOIL)			· -	2	2			
-	Bot	tom of Boring	- 6 feet						-			:		
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**Woodward-Clyde Consultants** PROJECT NAME City Center Garage II No. 90C0028A BORING NUMBER **ELEVATION AND DATUM** FL7 DATE STARTED DATE FINISHED DRILLING AGENCY DRILLER Phil / Ted Sierra Pacific Exploration June 1, 1990 COMPLETION DRILLING EQUIPMENT SAMPLER 2" Modified 6.0' Mobile B-53 DEPTH California Type NO. OF SAMPLES DRILLING METHOD DRILL BIT DIST. UNDIST. NA 8" Hollow Stem Auger SIZE AND TYPE OF CASING WATER FIRST COMPL. NA 24 HRS. NA NA NA LEVEL TYPE OF PERFORATION FROM TO FL LOGGED BY: CHECKED BY: NA SIZE AND TYPE OF PACK NA FROM TO FŁ W. Copeland G. Ford FROM τo FŁ NO. 1 NA TYPE OF SEAL FROM то Ft. NO. 2 NΑ SAMPLES REMARKS (Drill Rate, Fluid Loss, Odor DEPTH (feet) DESCRIPTION etc.) asphaltic concrete + gravel base SILTY SAND (SM) black, dry, pieces of brick, rebar, gravel (FILL) 5 2 CLAYEY SAND (SC) mottled reddish brown and gray, some silt, moist (NATIVE SOIL) Bottom of Boring - 6 feet 10 10 15 15 20 -20 25

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	IG NUME	BER FL8					VATION					<u>ge II</u> No. <u>9000028A</u>
DRILL	NG AGE		ion DRILLER	Phil / Ted			E STAR			June	e 1,	1990
DRILL	NG EQU	JIPMENT Mobile B-53					APLETIC		6.0	 )'		SAMPLER 2" Modified California Type
DRILL	ING ME		DRILL BIT			NO.		DIST	· 1	NA		UNDIST. 2
SIZE A	ND TYP	E OF CASING NA	<u> </u>			WAT	TER	FIRS	Ţ	NA		COMPL. NA 24 HRS. NA
TYPE (	OF PERF	FORATION NA	FROM	то	Ft.	+	GGED B	Υ:				CHECKED BY:
SIZE A	ND TYP	PE OF PACK NA	FROM	то	Ft.	7	W	. Cop	elan	d		G. Ford
TYPE	OF	NO.1 NA	FROM	то	Ft.							
SE.		NO.2 NA	FROM	то	Ft.							
	,					1		<b></b> -	SAMP	,		REMARKS (Drill Rate, Fluid Loss, Odor,
DEPTH (feet)		DI	ESCRIPTION				DEPTH (feet)	Drive Number	Sample	Recov. (Feet.)	Blow	etc.)
	asp	ha <u>ltic</u> c <u>oncrete</u> + <u>gr</u> av <u>el</u> ba <u>se</u>					-		,			
-	SILT	TY SAND (SM) ack, dry, pieces of brick, cloth, g	ravel (Ell.I.)				-	-				
_			ravor (Fizz)				-	1	1	777		
_	De	comes medium brown					-	<u> </u>				
5 —	CI 4	AYEY SAND (SC)					5 -	2	2			
	/ "	nottled reddish brown and gray,	some silt, damp (	NATIVE S	OIL)		1 -	-				
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-	Bo	ttom of Boring - 6 feet					-	1				
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YY UUUI YY A	ird-Ciyde Consultants			PRO						bala	<u>ge II</u> No. 90C0028A
BORING NUM	IBER FL9				ELEVAT	ION	AND I	DAT	JM		
DRILLING AG	ENCY Sierra Pacific Exploration	DRILLER	Phil / Ted		DATE ST	TAR'	TED HED		Jun	e 1,	1990
DRILLING EQ		1			COMPLE DEPTH			6.	0,		SAMPLER 2" Modified California Typ
DRILLING ME		DRILL BIT		<del> </del>	NO. OF		DIST.	.	NA		UNDIST. 2
SIZE AND TY	PE OF CASING NA	<u> </u>			WATER		FIFIS'	T	NA		COMPL. NA 24 HRS. NA
TYPE OF PER		FROM	то	Ft.	LEVEL	D B	Y:				CHECKED BY:
SIZE AND TY		FROM	то	Pt.		W.	. Сор	elar	nd		G. Ford
	NO.1 NA	FROM	то	Ft.	1		, c.up		_		G. 7 010
TYPE OF SEAL		FROM	то		-						
	NO.2 NA				<u></u>			AMP	LES		REMARKS
¥_	nes	CRIPTION				_	<b>├</b>		Т.		
DEPTH (feet)	DES	Omr Hole				(leet)	Orive Number	Samp Jumb	Peco.	Blow	etc.)
aşı	phaltic concrete + gravel base							V1 2.		Ť	
] SIĘ	TY SAND (SM) lack, dry, pieces of brick (FILL)										
-	lack, dry, pieces of brick (FILL)									<u> </u>	
-						-	1_	1		$\vdash$	
5 —					5	;	2	2			
	AYEY SAND (SC) mottled reddish brown and gray, so	me silt, damp	(NATIVE S	OIL)		-		_	,,,,,		
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_ Bo	ottom of Boring - 6 feet				1	.=					
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			F1		DRILLER	lanar/loff		D	ATE S	TARI	ED		lunc	. 12	, 1990	
DRILLIN			HEW Exploration	ori		Jasper/Jeff		ם	ATE FI	NISH	IED				SAMPLER 2" Modifie	<u></u> _
		IIPMENT	CME 45		DOUL DIT		.,	D	EPTH O. OF		DIST.	4.0			California Ty	/ <u>pe</u>
DRILLIN			6" Solid Aug	er	DRILL BIT			S	AMPLE	S	FIRS	<u>'</u>	NA		-	
SIZE AN	ID TYP	E OF CASI	NG NA					L	VATER EVEL				NA		INA :	۱A
TYPE OF	PERF	ORATION	NA		FROM		Ft.	I	LOGGE	D B	<b>Y</b> :				CHECKED BY:	
SIZE AN	D TYP	E OF PACI	NA		FROM	то	Ft.			W.	Сор	elan	d			
TYPE	OF	NO. 1	NA		FROM	TO	FL									
SEA		NO. 2	NA		FROM	то	Ft.									
		<u></u>			<u> </u>							SAMPI		<u>-</u>	REMARKS (Drill Rate, Fluid Loss, Od	or.
DEPTH (feet)				DESCR	PTION				i	DEPTH (feet)	Drive Number	Sample Number	Recov. (Feet.)	Blow	etc.)	
	_ Asc	ha <u>lti</u> ç c <u>or</u>	cręte + gravel	ba <u>se</u>			_	_		_			777	<u> </u>		
	SIL	TY SAND	(SM)							_	1	F1-1		10		
4	B (F	lack, dry, FILL)	fine grain, piec	es of dricks ar	10 WOOO					-	2	F1-2		1 4		
+		om of Po	ring - 4 feet							-	<del>  -</del> -	1	1///	-5		
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BORING N	12	Tabu / En				STAR						·
DRILLING	11ETT Exploration	DRILLER	Jasper/Jef	f 	DATE	FINIS	HED				1990	Modified
	EQUIPMENT CME 45				DEPT			5.0			Califo	ornia Type
DRILLING	METHOD 6" Solid Auger	DRILL BIT			NO. C	PLES	DIST.		IA.		UNDIST. 3	upe .
SIZE AND	TYPE OF CASING NA				LEVE	L _	FIRS	<u>'</u>	NA		NA :	HRS. NA
TYPE OF P	ERFORATION NA	FROM	то	FL	roc	GED B	Y:				CHECKED BY:	
SIZE AND	TYPE OF PACK NA	FROM	то	Ft.		W	. Cop	eland	j			
TYPE OF	NO. 1 NA	FROM	то	Ft.								
SEAL	NO. 2 NA	FROM	то	Ft.	}		<del></del> ;	SAMPL	ES		REMARKS	
χ	ne	SCRIPTION				_		r 1			(Drill Rate, Fluid	
DEPTH (feet)	DE	SCHIPTION				DEPT (feet)	Drive Number	Sample Number	Reco (Fee	Count		
	Aspha <u>ltic concrete + gr</u> av <u>el base</u>				_	<del> </del>	1	F2-1		_		
	SILTY SAND (SM)					.	2	F2-2	///			
	Black, dry, fine grain, with brick fra (FILL)	agments					<u></u> -	1.00	927			
-		14TIVE COIL 2\			_	5 -	3	F2-3				
5	becomes reddish-brown, damp (N	IATIVE SOIL!)			_/	.	-					
-	Bottom of Boring - 5 feet						1					
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	G NUMB	ER F3		ELI	EVATION	AND I	DATU	М				
DRILLI	NG AGE		DRILLER	Jasper/Jeff		DA DA	TE STAR	TED HED		June	13,	1990
DRILLI	NG EQU					co	MPLETIC PTH		4.0	)'		SAMPLER 2" Modified California Type
DRILL	NG MET		DRILL BIT			NO	OF MPLES	DIST.	· N	۱A		UNDIST. 2
SIZE A	ND TYPE	E OF CASING NA				WA	ATER VEL	FIRS	T	NA		COMPL. NA 24 HRS. NA
TYPE C	F PERF	ORATION NA	FROM	то	FL	1	OGGED E	Y:				CHECKED BY:
SIZE A	ND TYPI	E OF PACK NA	FROM	ro	Ft.	1	W	. Cop	elan	d		
			FROM	то	Ft.	1		·				
TYPE SE.		NO.1 NA	FROM	то	Ft.	1						
<u></u>		NO. 2 NA				<u>l</u> .	<del></del>	<del>   </del>	SAMPI	LES		REMARKS
E.		D	ESCRIPTION				E	à	8 8	÷ 🗘	, <u>e</u>	(Drill Rate, Fluid Loss, Odor, etc.)
DEPTH (feet)							DEPTH (feet)	Orive	Sam	Reco (Fee	Coun	
	Asp	ha <u>ltic con</u> cr <u>ete</u> + <u>gr</u> av <u>el</u> base				_	7,			7777	L.	
	SILT	Y SAND (SM) ack, dry, fine grain (FILL)						1	F3-1		_	
_	В	ack, dry, tine grain (FILL)						2	F3-2			
-	<u>∖ be</u>	comes medium brown (NATIV	E SOIL?)			/	ط <u>.</u> ۱	† <del>-</del>		722	1	
5 —	Во	ottom of Boring - 4 feet					5 -			1		
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BORING NUM	IBER F4				ELEV	ATION	AND I	UTAC	M		
DRILLING AG		DRILLER	Jasper/Jeft		DATI	E STAP	TED	· <del></del>	June	13,	, 1990
DRILLING EQ	IUDMENT				COM	PLETIC		5.0			SAMPLER 2" Modified California Type
DRILLING ME	CIVIE 45	DRILL BIT			NO.	OF.	DIST		IA.		UNDIST. 3
i	6 Solid Augel			· <del></del>	WAT	PLES ER	FIRS		NA		COMPL. NA 24 HRS. NA
TYPE OF PER		FROM	TO	Ft.	LEVE	EL GGED E			-		CHECKED BY:
		FROM	то	IFt.	<b>∤</b>		/. Cor	olon.	ч		
SIZE AND IT	PE OF PACK NA			<del></del>	-	V	r. COL	, Glai I	u		
TYPE OF SEAL	NO.1 NA	FROM	то	Ft.	-						
SEAC	NO. 2 NA	FROM	то	Ft.	<u> </u>		-	SAMP	FS		REMARKS
		FOORINTIAN				-		Ţ			(Dritt Bate Fluid Loss, Odor,
DEPTH (feet)	D	ESCRIPTION				DEPTH	Drive Number	Sample Number	Heco.	Blow	etc.)
i i	phaltic concrete + gravel base				_		1	F4-1			
SI	LTY SAND (SM)						<u> </u>		777		-
	Medium brown, dry, fine grain, w (FILL)	ith brick tragments					2	F4-2			
	→ Some clay						3	F4-3		_	-
5						5 -					
	Bottom of Boring - 5 feet										
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BORING NU	DRING NUMBER F5						ELEVATION AND DATUM						
DRILLING A	ILLING AGENCY HEW Exploration DRILLER Jasper/Jeff						DATE STARTED June 13, 1990						
DRILLING E	EQUIPMENT CME 45				CO	MPLETIO	N	4.0	)'		SAMPLER 2" Modified California Type		
DRILLING I		DRILL BIT	<u> </u>		NO SA	OF MPLES	N	IA	i	UNDIST. 2			
SIZE AND T	IZE AND TYPE OF CASING NA						FIRST	1	NA		COMPL. NA 24 HRS. NA		
TYPE OF P	ERFORATION NA	FROM	то	Ft.	_	VEL :	Y:				CHECKED BY:		
SIZE AND	TYPE OF PACK NA	FROM	10	Ft.		W.	Сор	elan	d				
	NO.1 NA	FROM	то	Ft.	1								
TYPE OF SEAL		FROM	то	Ft.	1								
<del></del>	NO. 2 NA				<u> </u>	-	S	AMPL	.ES		REMARKS		
DEPTH (feet)	DE	SCRIPTION				DEPTH (feet)	Drive Number	Sample Number	Recov. (Feet.)	Blow Counts	(Drill Rate, Fluid Loss, Odor, etc.)		
1	A <u>sphaltic concrete</u> + <u>gr</u> av <u>el</u> ba <u>se</u>				_			<i></i>					
] s	SILTY SAND (SM)	1 11					1	F5-1		_			
	Greenish-brown, dry, fine grain sa (FILL)	nd with some clay				-	2	55.0	777	_			
<del>- </del>								F5-2					
5 —	D. I					5 -							
	Bottom of Boring - 4 feet					_	]						
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BORING N	JMBI	ER	F6					_[_	LEVAT			ATU	M		
RILLING A	ILLING AGENCY HEW Exploration DRILLER Jasper/Jeff							D	ATE S	INISi	IED		June		, 1990
RILLING I	EQUI		CME 45	<u> </u>				C	OMPLI EPTH	ETIO	N	5.0	)'		SAMPLER 2" Modified California Type
ORILLING	MET	HOD	6" Solid Auger	DR	ILL BIT			N	O. OF	ES	DIST.	N	IA		UNDIST. 3
IZE AND	TYPE	OF CAS						W	VATER EVEL		FIRST	Г	NA		COMPL. NA 24 HRS. NA
YPE OF P	ERF	ORATION		F	ROM	то	Ft.	+	LOGG	ED B	Y:				CHECKED BY:
SIZE AND			1471	FF	ROM	то	IFL.	1		W.	Сор	elan	d		
	1			FF	ROM	то	FŁ	1							
TYPE OF SEAL	ŀ	NO. 1	NA		ROM	то	Ft.	$\dashv$							
<del></del> .		NO. 2	NA								Ţ <u>-</u>	AMP	LES		REMARKS
z l				DESCRIPT	ION					E_	ber	pie ber	ž £	2 #	(Drill Rate, Fluid Loss, Odor, etc.)
DEPTH (feet)				DESCRIB!						DEPTH (feet)	Orive Number	Sam	75 (F. P. P. P. P. P. P. P. P. P. P. P. P. P.	S B	
;	A <u>sp</u>	ha <u>ltic</u> ∝	oncrete + gravel base	<u>e</u>				_		_	1	F6-1			
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4	(FI	LL)				·				-	-		(///		-
4		В	Brick fragments							_	3	F6-3			=
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	Bo	ttom of	Boring - 5 feet							-	4				
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BORING NUM	ABER -					EVATION		DATU	M		
		DRILLER	Jasper/Jeff		DA	TE STAR	TED		June	13	, 1990
DRILLING AC	NUBLENT		CO	MPLETIC		5.0			SAMPLER 2" Modified		
DRILLING M	CME 45		<del></del>	NO	PTH D. OF	DIST		NA.		California Type	
	6" Solid Auger		WATER FIRST						COMPL. NA 24 HRS. NA		
TYPE OF PER	177	FROM	то	Ft.	_	OGGED E					CHECKED BY:
	PE OF PACK NA	FROM	то	Ft.	┤		. Cop	elan	d		
	1	FROM	то	Ft.	1	•	. 00		_		
TYPE OF SEAL	NO. 1 NA	FROM	то	Ft.	+						i
	NO. 2 NA						1	SAMP	LES		REMARKS
¥ _	DE	SCRIPTION				E.	<u> </u>			2.2	(Drill Rate, Fluid Loss, Odor, etc.)
DEPTH (feet)						Get DEP	Drive Number	Sam	₽ <u>₽</u>	Sour	
	sphaltic concrete + gravel base			- <b>-</b>	_		1	F7-1			
SI - E	LTY SAND (SM) Black, damp, fine grain sand with s	some clay (FILL	)				2	F7-2		<u></u>	
4							<del>  -</del>	$\vdash$	722		
T	ecomes reddish-brown					5 -	3	F7-3			
5						3					
]	Bottom of Boring - 5 feet						4				
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VOOQW	ard-Clyde Consultants			PRO		NAME				ui ac	<u>e II No. 30000237.</u>	
ORING NUM	DRING NUMBER F8											
ORILLING AC	ILLING AGENCY HEW Exploration DRILLER Jasper/Jeff					DATE STARTED June 13, 1990						
ORILLING EC	LLING EQUIPMENT CME 45						N	4.0	);	[	SAMPLER 2" Modified California Type	
DRILLING M		DRILL BIT			NO.	OF MPLES	DIST.	١	NA.		UNDIST. 2	
SIZE AND TY	PE OF CASING NA				WA		FIRST	Г	NA		COMPL. NA 24 HRS. NA	
YPE OF PE	REFORATION NA	FROM	то	IPt.	_	OGGED B	Y:				CHECKED BY:	
SIZE AND T	PE OF PACK NA	FROM	то	Ft.	1	w	Сор	elan	d			
	T	FROM	то	Ft.	-							
TYPE OF SEAL	NO.1 NA	FROM	то	Ft.	╣							
—	NO. 2 NA					<del></del>		AMP	LES	·	REMARKS	
(feet)	DE	SCRIPTION				DEPTH (feet)	Drive	Sample	Recov. (Feet.)	Blow	(Drill Rate, Fluid Loss, Odor, etc.)	
ı	spha <u>ltic concrete + gr</u> av <u>el base</u>		<del></del>									
-							1	F8-1		=		
	LTY SAND (SM) Black, dry, fine grain (FILL)					-	2	F8-2	011	_		
+					—		+=	1 5-2	1///	1	1	
5	Bottom of Boring - 4 feet					5 -	]					
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		d-Ciyde Consultants					EVA		AND I		u		
BORIN	DRING NUMBER F9												
DRILLI	NG AGE	NCY HEW Exploration	DRILLER	Jasper/Jeff		D	ATE I	INISI	HED				1990
DRILLI	NG EQU	IPMENT CME 45	<del></del>			C	OMPI EPTH	ETIO	N	5.0	)'		SAMPLER 2" Modified California Type
DRILL	NG MET		DRILL BIT			N	O. OF	ES	DIST.	N	<b>J</b> A		UNDIST. 3
SIZE A	ND TYP	E OF CASING NA				V	ATE!	3	FIRS	r į	NA		COMPL. NA 24 HRS. NA
TYPE C	F PERF	ORATION NA	FROM	то	Ft.	_		ED B	Y:				CHECKED BY:
SIZE A	ND TYP	E OF PACK NA	FROM	TO	Ft.	1		w	. Сор	elan	d		
			FROM			1			•				
TYPE SE.	OF AL	NO.1 NA		TO		-							
		NO.2 NA	FROM						1 -	SAMPL	FS		REMARKS
-								-	<del></del>		· · · · ·		I ID-20 Data Shiid Loop Odor
DEPTH (fect)		DES	CRIPTION					DEPTH (feet)	Drive Number	Sample Number	Feet.	Blow	etc.,
<del></del>	Asp	haltic concrete + gravel base				_			1	F9-1		Ĕ	
-		<del>-</del> -						_			~		
-	Di	TY SAND (SM) ark brown, dry, fine grain (FILL)						_	2	F9-2		-	
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5 —				<u></u>				5 -	13-	F9-3			
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-	[	Bottom of Boring - 5 feet						'	1				
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	BORING NUMBER F10								ELEVATION AND DATUM						
DRILL	ING AGE		<u></u>	DAT	E STAR	TED		June	13	, 1990					
		CME 45					IPLETIC		4.0	)'		SAMPLER 2" Modified California Type			
DRILL	ING ME	THOD	DRILL BIT				OF APLES	DIST.	١	NA		UNDIST. 2			
SIZE	AND TYP	6" Solid Auger PE OF CASING NA				WA	TER :	FIRS	r	NA		COMPL. NA 24 HRS. NA.			
TYPE	OF PERF	FORATION NA	FROM	то	FL	1	GGED B	Υ:	<del></del>			CHECKED BY:			
SIZE	AND TYP	PE OF PACK NA	FROM	то	Ft.	1	W	. Cop	elan	d		G. Ford			
		NO.1 NA	FROM	то	FL	1									
TYP:	E OF AL		FROM	то	Ft.	4									
		NO. 2 NA		<del>.</del>		<u></u> _			SAMP	LES		REMARKS			
DEPTH (feet)		DI	ESCRIPTION				DEPTH (feet)	Drive Number	Sample Number	Recov. (Feet.)	Blow	(Drill Rate, Fluid Loss, Odor, etc.)			
	Asr	phaltic concrete + gravel base							,, <u>.</u>		Ľ				
-	SIL	TY SAND (SM) ark brown, dry, fine grain with lith						1_	F10-1		_				
	3	ark brown, dry, fine grain with litt Io Clay	tle clay (FILL)				-	2	<u> </u>	777	Ł				
-	† '`	Olay					•	-	F10-2	1///	1	-			
5 -	1						5 -					<u> </u>			
-	1	Bottom of Boring - 4 feet													
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BORING NUM	DRING NUMBER F11												
DRILLING AC	ILLING AGENCY HEW Exploration DRILLER Jasper/Jeff							ED ED				, 1990	2" Modified
DRILLING EC	CME 45				DE	OMPLE EPTH			5.0	D,			alifornia Type
DRILLING M		DRILL BIT			NC S/	O. OF AMPLE	<u>s :</u>	DIST.	- 1	NA.		UNDIST.	3
SIZE AND TY	PE OF CASING NA				W.	ATER EVEL		FIRS	r	NA		COMPL. NA	24 HRS. NA
TYPE OF PER	REPORATION NA	FROM	то	FL	_	OGGE	DB,	Y:			-	CHECKED	BY:
SIZE AND TY	PE OF PACK NA	FROM	то	Ft.	1		W.	Сор	elan	d			
	NO.1 NA	FROM	то	FL	1								
TYPE OF SEAL		FROM	70	Ft.	1								
	NO. 2 NA				1	Т.			SAMP	LES	—-		ARKS
Ę,	DE	SCRIPTION				7	<u> </u>	je d	p p p	કું <u>છે</u>	<b>≱</b>	(Drill Rate, etc.)	Fluid Loss, Odor,
DEPTH (feet)						- 1	(feet)	Drive Number	Sam	5 F	Cour		
	sphaltic concrete + gravel base				_			1	F11-1				
Sı	LTY SAND (SM) Medium brown, damp, with brick a	and moster frogme	nte /Ell I \				_	2	F11-2	011	_	}	
	Medium brown, damp, with brick a	ino monar iragine	ms (FILL)				-	<del>-</del>	F11-2	1//			
							_	3	F11-3		-	1	
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-	Bottom of Boring - 5 feet						_						
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	ara-cryde Consultanto				ELEV/	TION	AND D	ATUR					_1
BORING NUMBER F12  DRILLER Insper/Loff DATE STARTED June 13, 1990													
DRILLING AC	TILTY Exploration	DRILLER	Jasper/Jeff		DATE	FINISI	HED				1990	2" Modified	
DRILLING EC	CME 45				COMP	Н	<b>~.</b>					<u>California Ty</u>	₽e
DRILLING M	ETHOD 6" Solid Auger	DRILL BIT			NO. O SAMP	DIST.		Α		UNDIST.	2		
SIZE AND TY	PE OF CASING NA				LEVE	R -	FIRST		JA_	_	COMPL.	IA 24 HRS. N	IA
TYPE OF PE	REPORATION NA	FROM	то	Ft.	LOG	GED 8	<b>Y</b> :				CHECKE	BY:	
SIZE AND TO	YPE OF PACK NA	FROM	то	Ft.		W	. Cop	eland	t				
TYPE OF	NO.1 NA	FROM	то	Ft.									l
TYPE OF SEAL	NO. 2 NA	FROM	то	Ft.									
						Ţ _		AMPL				MARKS -, Fluid Loss, Odd	
DEPTH (feet)	DE	SCRIPTION				DEPTH (feet)	Drive Number	Sample	Recov.	Blow	etc.)	e, Figit Coss, Out	
	sphaltic concrete + gravel base _					Ι.	<u> </u>			_			
	LTY SAND (SM) Black, dry, fine grain, with brick fraç	( <u></u>					1	F12-1					1
	Black, dry, fine grain, with brick trac	ments (FILL)					2	F12 <u>-2</u>					
<del>                                     </del>				<del></del>		·		F12-2	777				
5 —	Bottom of Boring - 4 feet					5 -							ļ
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WOOdwa	ira-Ciyae Consaitants					VATION		OATIL	М		
BORING NUM	DRING NUMBER F13  DRILLER Jasper/Jeft										
DRILLING AG	ENCY HEW Exploration		DATE STARTED June 13, 1990								
DRILLING EQ	CME 45				DEP		)N	4.0	)'		SAMPLER 2" Modified California Type
DRILLING ME		DRILL BIT			NO.	NO. OF DIST. NA				•	UNDIST. 2
SIZE AND TY	SIZE AND TYPE OF CASING NA						FIRS	T	NA		COMPL. NA 24 HRS. NA
TYPE OF PER	REPORATION NA	FROM	TO	Ft.	LEV	GGED I	3Y:				CHECKED BY:
SIZE AND TY	PE OF PACK NA	FROM	TO	Ft.	]	W	/. Cor	elan	d		
	NO. 1 NA	FROM	то	Ft.	1						
TYPE OF SEAL	NO. 2 NA	FROM	то	Ft.	1						
	10.2				<u></u>			SAMPI	ES		REMARKS
DEPTH ((cet)	DES	CRIPTION				DEPTH (feet)	Drive	Sample Number	Recov. (Feet.)	Blow Counts	(Drill Rate, Fluid Loss, Odor, etc.)
As	pha <u>ltic concrete + gr</u> av <u>el base</u>					-		<u> </u>	,,,,,		
SIL	_TY SAND (SM) Black, damp, fine grain (FILL)						1	F13-1			
	Black, damp, fine grain (FILL) contains gravel and mortar						2	F13-2			
<del>                                     </del>	Sinding graver and mortal					ا ـِ ا	<del>  _</del>	<del> </del>	722		
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	NG AGE		F14		DRILLER	Jasper/Jeff		D	ATE S	TAR	rED		June	13.	1990
		IPMENT	HEW Explorat	ion		baspenben		C	ATE F	ETIO		5.0			SAMPLER 2" Modified
			CME 45		DRILL BIT			N	EPTH O. OF	- :	DIST.		IA		California Type
	NG MET		6" Solid Auge	er				S/	AMPL	ES	FIRS	-			COMPL. NA 24 HRS. NA
		E OF CAS			FROM			나	OGG				NA		CHECKED BY:
		ORATION	11/1		FROM	то	19L 	╣	_OGG			-1	_		Checked bi.
SIZE A	ND TYP	E OF PAC	K NA		FROM	то	1Ft.	4		W	. Cop	elan	Q		
TYPE	OF	NO. 1	NA		FROM	то	FL	$\frac{1}{2}$							
SE	AL	NO. 2	NA		FROM	то	Ft.	L			,				REMARKS
										_	<b></b> ,	AMPI			man man Endal and Odor
DEPTH (feet)				DESCR	IPTION				Ì	DEPTH (fect)	Drive Number	amp	Recov (Feet.	Blow	etc.)
	Asr	haltic co	oncrete + grave	base							1	60 Z F14-1	,,,,,		
-										_			7777		
	ВІ	ack, dry	D (SM) , fine grain sand	d with debris	(FILL)					-	2	F14-2			
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		u-Ciyue Consultants					VATION			М		
BORING I	NUMB	F15				<u> </u>						
DRILLING	AGE	NCY HEW Exploration	DRILLER	Jasper/Jeff		DA.	TE STAR TE FINIS	HED			13	, 1990
DRILLING	EQU	IPMENT CME 45				DE	MPLETIC PTH		4.0	)' 		SAMPLER 2" Modified California Type
DRILLING	MET		DRILL BIT			NO.	OF MPLES	DIST.		NA.		UNDIST. 2
SIZE AND	TYP	E OF CASING NA	<u> </u>			WA LE	TER VEL	FIRS	Τ	NA		COMPL. NA 24 HRS. NA
TYPE OF	FERF	FORATION NA	FROM	то	Ft.	_	OGGED E	Y:				CHECKED BY:
SIZE AND	TYP	E OF PACK NA	FROM	το	Ft.		W	. Сор	elan	ď		
		NO.1 NA	FROM	то	Ft.							
TYPE O SEAL	r	NO. 2 NA	FROM	то	FL.							
		NO.2 NA				⊥.	<del>-</del>		SAMP	LES		REMARKS
DEPTH (fect)		DES	CRIPTION				DEPTH (feet)	Drive Number	Sample	Recov. (Feet.)	Blow Counts	(Drill Rate, Fluid Loss, Odor etc.)
	Asp	nha <u>ltic concrete + gr</u> av <u>el base</u>				_	-					
	SILT	TY SAND (SM) ack, dry, fine grain sand with debri	- ( <u>-</u> (-					1	F15-1			
4	Bla	ack, dry, tine grain sand with debri	s (FILL)					2	F15-2			1
+		4					<b></b>	<u> </u>			1	1
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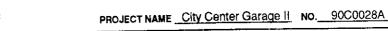


		d-Cryde Consultants					VATION			<u></u>		
BORING	NUMB	F16	DRILLER			İ	E STAR					1000
DRILLIN		TIETT Exploration	DHILLER	Jasper/Jeff		DAT	E FINIS	HED				1990 SAMPLER 2" Modified
DRILLIN	G EQU	CME 45				DEP	TH		5.0			California Type
DRILLIN	IG MET	THOD 6" Solid Auger	DRILL BIT				PLES	DIST		IA.		UNDIST. 3
SIZE AN	D TYP	E OF CASING NA				WA1	FER EL	FIRS	<u> </u>	NA_		COMPL. NA 24 HRS. NA
TYPE OF	PERF	ORATION NA	FROM	то	FL	LO	GGED E	Y:				CHECKED BY:
SIZE AN	D TYP	E OF PACK NA	FROM	то	PL.		W	. Cop	elan	d		
TYPE	 D <b>F</b>	NO. 1 NA	FROM	то	Ft.							
SEA	Ĺ	NO. 2 NA	FROM	то	IPt.							
T		<u> </u>				<u> </u>		<u> </u>	SAMPL			REMARKS (Drill Rate, Fluid Loss, Odor,
DEPTH (feet)		DE	SCRIPTION				DEPTH (feet)	Drive Number	Sample Number	Recov. (Feet.)	Blow	etc.)
	Asp	haitic concrete + gravel base					-	1	F16-1			
	SIL	TY SAND (SM) ack, dry, fine grain sand with del	oris (FILL)					2	F16-2	////	_	
-	ום	ack, dry, mile grain outle will be	, , , , , , , , , , , , , , , , , , ,					╀▔	F16-2	772	1	
-							5 -	3	F16-3		$\equiv$	
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Noo	dwa	rd-Clyde Consultants			PRO							<u>en 140</u>
BORIN	G NUMI	BER F17				l .	EVATION					
DRILLI	NG AGI	ENCY HEW Exploration	DRILLER	lasper/Jeff		DA	TE START	IED		June		1990
DRILLI	NG EQ	UIPMENT CME 45					MPLETIO	N	4.0	)'	- 1	SAMPLER 2" Modified California Typ
DRILL	ING ME		DRILL BIT			NO		DIST.		ΙA		UNDIST. 2
SIZE A	ND TYP	PE OF CASING NA				WA		FIRST	1	NA		COMPL. NA 24 HRS. N.
TYPE (	OF PER	FORATION NA	FROM	то	Pt.	<del></del> -	OGGED B	Y:				CHECKED BY:
SIZE A	ND TY	PE OF PACK NA	FROM	то	Ft.	-	W.	. Сор	elan	d		
			FROM	то	Ft.	1						
TYPE SE	OF AL	NO.1 NA	FROM	то		1						
	,	NO. 2 NA				<u> </u>		<u> </u>	AMPL	ES		REMARKS
DEPTH (feet)		DE	ESCRIPTION				DEPTH (feet)	Drive Number	Sample Number	Recov. (Feet.)	Blow	(Drill Rate, Fluid Loss, Odo etc.)
	Aş	phaltic concrete + gravel base					7	<u> </u>				
_		TY SAND (SM) Black, dry, with brick and mortar fr					-	1 1	F17-1		1	1
_	В	Black, dry, with brick and mortar fr	agments (FILL)				-	2	F17-2		_	
_								<del>-</del> -		<i>Y22</i> 2	1	-
5 —	P	Sottom of Boring - 4 feet					5 -					
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WOODW	ard-Ciyde Consultan	is •		PHO						<u>uruc</u>	e ii NO. 30000	
BORING NU	MBER F18				ELEV			UTAU	M 			
DRILLING A	GENCY HEW Exploration	DRILLER Ja	sper/Jeff		DATE DATE	FINIS	HED		June	13,	1990	
DRILLING E					COMP	LETIO H	N	5.0	)' 		SAMPLER 2" Mox California	dified a Typ <u>e</u>
DRILLING N		DRILL BIT		·	NO. O		DIST		VA.		UNDIST. 3	
SIZE AND T	YPE OF CASING NA	<u></u>			WATE	R	FIRS	Ť	NA		COMPL. NA 24 HRS	S. NA
TYPE OF PE	REFORATION NA	FROM	то	Ft.		GED B	Y:				CHECKED BY:	
SIZE AND T	YPE OF PACK NA	FROM	то	Ft.		W	. Cop	elan	đ			
	NO.1 NA	FROM	то	Ft.	1						ı	
TYPE OF SEAL	NO. 2 NA	FROM	то	IFt.	1							
	NO. 2 NA				<u></u>			SAMP	LES		REMARKS	<del></del> –
DEPTH (feet)		DESCRIPTION				DEPTH (feet)	Drive Number	Sample	Recov. (Feet.)	Blow	(Drill Rate, Fluid Loss etc.)	, Odor,
<b>1</b> 1	sphaltic concrete + gravel bas	e _ <b>_</b>					1	F18-1				
	ILTY SAND (SM) Black, dry, fine grain sand with								777			
	Black, dry, fine grain sand with	debris (FILL)					2	F18-2				
-							3	F18-3				
5 —						5	1	<b>†</b>	////			
	Bottom of Boring - 5 feet											
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ELEVATION AND DATUM BORING NUMBER F19 DATE STARTED DATE FINISHED DRILLER June 14, 1990 DRILLING AGENCY Jasper/Jeff **HEW Exploration** 2" Modified COMPLETION SAMPLER DRILLING EQUIPMENT 5.0 California Type DEPTH CME 45 NO. OF SAMPLES UNDIST. DIST. DRILL BIT NA DRILLING METHOD 6" Solid Auger COMPL. NA 24 HRS. NA WATER FIRST SIZE AND TYPE OF CASING NA NA LEVEL CHECKED BY: TYPE OF PERFORATION FROM TO LOGGED BY: NA то Ft. SIZE AND TYPE OF PACK FROM C. Rambo NA TO Ft. FROM NO. 1 NA TYPE OF SEAL FROM NO. 2 NΑ SAMPLES REMARKS (Drill Rate, Fluid Loss, Odor, DEPTH (feet) **DESCRIPTION** Asphaltic concrete + gravel base SILTY SAND (SM)
Dark brown, dry, fine grain sand, contains brick, wood fragments and gravel (FILL) F19-2 F19-3 3 5 5 Bottom of Boring - 5 feet 10 10 15 15 20 20 -25 30 30

SORING NU	ard-Clyde Consultants  MBER F20					EVATION					<u>e II No. 9000026A</u>
RILLING A		DRILLER	Jasper/Jef	· <del></del> ;	DA DA	ATE STAR	TED HED		June	14,	1990
	QUIPMENT CME 45				CC	OMPLETIO		5.0	)'		SAMPLER 2" Modified California Typ
RILLING N	ETHOD	DRILL BIT		<u></u>	NC.	D. OF	DIST	N	ĮΑ		UNDIST. 2
IZE AND T	6" Solid Auger  YPE OF CASING NA	<u> </u>			W.	ATER EVEL	FIRS	T ,	NA		COMPL. NA 24 HRS. NA
	REPORATION NA	FROM	то	Ft.	_	OGGED B	Y:		·		CHECKED BY:
	YPE OF PACK NA	FROM	то	Ft.	1	C.	Rar	odi			
		FROM	то	FL.	-	-					
TYPE OF SEAL	NO. 1 NA	FROM	то	Ft.	$\dashv$						
	NO. 2 NA	PROM			⊥_		<del></del> :	SAMPL	FS		REMARKS
DEPTH (feet)	DE	ESCRIPTION				DEPTH (feet)	Orive Number			Blow	ADDITION Florid Lane Oder
3	spha <u>ltic concrete</u> + gravel base									Ť	
-	ILTY SAND (SM)						ļ		777	5	
	Dark brown, moist, fine grain sand (FILL)	d, with brick fragm	ents and gra	avel		-	1	F20-1		5	
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5						5 -	1	I	7222	<u> </u>	
-	Bottom of Boring - 5 feet						]				
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	nen				ELEV	ATION	AND I	DATU	VI.			
BORING NUM	1 4.1	DRILLER	1		DATE	STAR	TED		luna	4.4	1990	
DRILLING AG	TILTY Exploration	DAILLE	Jasper/Jef		DATE	FINIS	HED				SAMPLER	2" Modified
DRILLING EQ	CME 45				DEPT	Ή		5.0			UNDIST.	alifornia Type
DRILLING ME	THOD 6" Solid Auger	DRILL BIT		<u></u>		PLES	DIST		A			3
SIZE AND TY	PE OF CASING NA				LEVE	ER L	FIRS	<u> </u>	VA_		COMPL. NA	24 HRS. NA
TYPE OF PER	FORATION NA	FROM	то	FL.	LOG	GED B	Υ;				CHECKED B	Υ:
SIZE AND TY	PE OF PACK NA	FROM	то	Ft.		C.	Ran	odr				
TYPE OF	NO.1 NA	FROM	ŦΟ	Ft.								
SEAL	NO. 2 NA	FROM	то	Ft.								
					<del></del>		-	SAMP			REM/	ARKS Tuid Loss, Odor,
OEPTH (feet)	DE	SCRIPTION				DEPTH (feet)	Drive Number	Sample	Recov. (Feet.)	Blow Counts	etc.)	Idia 2000, Gdoil
	phaltic concrete + gravel base		· — —		_		1	F21-1		7 9		
	_TY SAND (SM)					.	<u> </u>		777	9		
	Dark grey-brown, damp, fine grain	sand with brick f	iragments	(FILL)		.	2	F21-2		9	<u> </u>	
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В	ottom of Boring - 5 feet									i.		
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**ELEVATION AND DATUM** BORING NUMBER F22 DATE STARTED DRILLER June 14, 1990 DRILLING AGENCY Jasper/Jeff DATE FINISHED **HEW Exploration** SAMPLER 2" Modified California Type COMPLETION DEPTH DRILLING EQUIPMENT 5.0 CME 45 NO. OF SAMPLES UNDIST. DRILL BIT DIST. NA DRILLING METHOD 6" Solid Auger COMPL. NA 24 HRS. NA WATER LEVEL FIRST SIZE AND TYPE OF CASING NA NA CHECKED BY: LOGGED BY: TYPE OF PERFORATION FROM NA TO Ft. SIZE AND TYPE OF PACK FROM C. Rambo NA FL FROM TO NO. 1 NA TYPE OF SEAL FROM Ft. NO. 2 NA SAMPLES REMARKS (Drill Rate, Fluid Loss, Odor, DEPTH (feet) DESCRIPTION Asphaltic concrete + gravel base SILTY SAND (SM) F22-1 Dark brown, moist, fine grain sand with brick fragments (FILL) 2 5 Bottom of Boring - 5 feet 10 10 15 15 20 20 25 30 30 -35

Woodwa	rd-Clyde Consultants			PRO				age II No. 3000020A
BORING NUM	BER F23				ELEVATION	AND DA	TUM	
DRILLING AG		DRILLER	Jasper/Jeff		DATE STAF	RTED HED	June 1	4, 1990
DRILLING EQ		<u>,<b>.l</b></u>			COMPLETION	ON	5.0'	SAMPLER 2" Modified California Typ
DRILLING ME		DRILL BIT	····		NO. OF SAMPLES	DIST.	NA	UNDIST. 3
SIZE AND TYP	PE OF CASING NA				WATER LEVEL	FIRST	NA	COMPL. NA 24 HRS. NA
TYPE OF PER		FROM	то	Ft.	LOGGED	3Y:		CHECKED BY:
SIZE AND TY		FROM	TO	Ft.	j 0	. Ramb	0	
	· · · · · · · · · · · · · · · · · · ·	FROM	то	Ft.				
TYPE OF SEAL	NO.1 NA	FROM	то	Ft.	1			
	NO. 2 NA				1	SA	MPLES	REMARKS
Ξ_	DE!	SCRIPTION			E	ě	, ; ; b	(Drill Rate, Fluid Loss, Odo
OEPTH (feet)		301111 11011			DEP	Number	Number Recov. (Feet.)	Coun
As	phaltic concrete + gravel base						00 V///L	9
SIL	LTY SAND (SM) Dark grey-brown, damp to moist, fi	ine grain sand wit	h brick fragn	nerits		2 F		7.
_	Dark grey-brown, damp to moist, fi (FILL)	<b>9</b>	· ·			+= [	32///	8
4	Becomes brown				_	3 F	23-3	6 B
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	Bottom of Boring - 5 feet					1		
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BORING N	NUMB	ER	F24					ļ	/ATION		DATU	M				
DRILLING	AGE	NCY H	IEW Explorati	on	DRILLER	Jasper/Jeff		DAT	E STAR E FINIS	TED HED	-	June	13	, 1990		
DRILLING	EQU		CME 45						PLETIC		4.0	)'		SAMPLER	2" Moc California	dified Type
DRILLING	MET	HOD			DRILL BIT			NO.		DIST	· N	IA		UNDIST.	2	
SIZE AND	TYPE	E OF CASI	6" Solid Auge NG NA	1	<u> </u>			WAT	ER	FIRS	Т	NA		COMPL. N	24 HRS	. NA
		ORATION	NA NA		FROM	то	Ft.	LEVI	GED E	Y:				CHECKED	BY:	
		E OF PACE			FROM	то	Ft.	1		. Cor	elan	d				
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TYPE OF	F		NA		FROM	TO	Ft.	-								
	,	NO. 2	NA		1, 1,0,111					Τ	SAMPL	.ES		REA	IARKS	
ž.				nesce	IPTION				E	100	2 2	¥ 3	ء د	1	Fluid Loss,	, Odor,
DEPTH (feet)				peson					(feet)	Drive	Sam	Reco Fee	Coun			
	Asp	ha <u>ltic</u> cor	ncrete + grave	base				_				,,,,				
]	SILT	TY SAND	(SM) ine grain with (	daba'a /™	111					1	F24-1		1	1		
4	Bla	ack, dry, f	ine grain with (	debris (FI	LL}					2	F24-2	777	=	1		
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5 —	В	ottom of E	Boring - 4 feet						5 -					:		
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Woodw	ard-Clyde Consultants	•		PRO					age II No. 90C0028A
BORING N	JMBER F25				ELEVATION	DIA M	DATU	<b>VI</b>	
DRILLING A	AGENCY HEW Exploration	DRILLER	Jasper/Jeff		DATE STA	RTED SHED		lune 1	4, 1990
DRILLING E	EQUIPMENT CME 45			,	COMPLET	ON	5.0	1	SAMPLER 2" Modified California Type
DRILLING		DRILL BIT			NO. OF SAMPLES	DIST	. N	IA	UNDIST. 3
SIZE AND	TYPE OF CASING NA	<u> </u>			WATER	FIRS	T	NΑ	COMPL. NA 24 HRS. NA
TYPE OF P	ERFORATION NA	FROM	то	Ft.	LOGGED	BY:			CHECKED BY:
SIZE AND	TYPE OF PACK NA	FROM	то	PL.	7	. Ran	odn		
TYPE OF	NO. 1 NA	FROM	то	Ft.	1				
SEAL	NO.2 NA	FROM	то	Ft.					
						<b>J</b>	SAMPL		REMARKS (Drill Rate, Fluid Loss, Odor,
DEPTH (feet)	DE	SCRIPTION			DEPTH	Drive Number	Sample	Recov. (Feet.) Blow	etc.)
	Asphaltic concrete + gravel base					1	F25-1		<u>3</u>
] \$	SILTY SAND (SM) Dark brown, moist, fine grain sand	with debris (FI	LL)			2	F25-2		2
4	becomes lighter brown					+-		7//	9
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5	Bottom of Boring - 5 feet					-			
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**ELEVATION AND DATUM BORING NUMBER** F26 DATE STARTED DATE FINISHED DRILLER June 14, 1990 Jasper/Jeff DRILLING AGENCY **HEW Exploration** COMPLETION DEPTH 2" Modified SAMPLER DRILLING EQUIPMENT 5.0 California Type **CME 45** UNDIST. NO. OF SAMPLES DRILL BIT DIST. NA DRILLING METHOD 6" Solid Auger COMPL. NA 24 HRS. NA WATER FIRST SIZE AND TYPE OF CASING NA NA LEVEL CHECKED BY: LOGGED BY: FROM TYPE OF PERFORATION TO Ft. NA SIZE AND TYPE OF PACK FROM то FL C. Rambo NA FROM TO Ft. NO. 1 NA TYPE OF SEAL FROM Ft. то NO. 2 NA SAMPLES REMARKS (Drill Rate, Fluid Loss, Odor, DEPTH (feet) DESCRIPTION Asphaltic concrete + gravel base SILTY SAND (SM) Dark brown, damp, fine grain sand with debris (FILL) F26-1 becomes lighter in color 2 F26-2 5 Bottom of Boring - 5 feet 10 15 15 20 20 25 30 30 -



Woodward-Clyde Consultants											urug	<u>e ii No. 300002671</u>
BORING	NUME	BER F27			ELE	VATION	AND (	DTAC	M			
DRILLI	NG AGE	NCY HEW Exploration	DRILLER	Jasper/Jeff		DAT	E STAR	TED HED		June		1990
DRILLII	NG EQU	IIPMENT CME 45				CON	IPLETIO	N	5.0	) <sup>'</sup>		SAMPLER 2" Modified California Type
DRILLI	NG ME		DRILL BIT			NO.	OF IPLES	DIST.	- 1	VΑ		UNDIST. 3
SIZE A	ND TYP	E OF CASING NA	<u>l</u>			WA1	TER :	FIRS	Τ	NA		COMPL. NA 24 HRS. NA
TYPE C	F PERF	FORATION NA	FROM	то	Ft.		GGED B	Y;				CHECKED BY:
SIZE A	ND TYP	PE OF PACK NA	FROM	то	Ft.	]	C.	Ran	odr			•
		NO.1 NA	FROM	то	Ft.	1						
TYPE		NO.2 NA	FROM	то	Ft.	1						
<del>                                     </del>						<del></del>		_	SAMP	T		REMARKS (Drill Rate, Fluid Loss, Odor,
DEPTH (feet)		DES	CRIPTION				F S	Drive Number	ed E	cov.	low	etc.)
28		halfia conerata y graval haca						5 <u>2</u>	50 Z		<b>8</b> 8	
-		phaltic concrete + gravel base		· — — —	_		1 -	<u> </u>		7//	9	
	SIL	TY SAND (SM) ark grey-brown, moist, fine grain	(FILL)					2	F27-2		4	
	be	ecomes lighter brown					.	<u> </u>	F27-		3	
5 -	<del></del>	SILTY SAND (SM) (NATIVE	)				5 ~	3	F27~	'Y/Z	3 5	}
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-	В	lottom of Boring - 5 feet	-					]				
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BORING	NUMB	BER F28				ELE	VATION	AND I	DATUI	M 		
DRILLING	AGE	NCY HEW Exploration	DRILLER	Jasper/Jeff		DAT	E STAR E FINISI	TED HED		June	14	1990
DRILLING	EQU					CON	APLETIC	N	5.0	)'		SAMPLER 2" Modified California Type
DRILLING	G MET		DRILL BIT			NO.		DIST.	N	Α		UNDIST. 2
SIZE AND	TYP	E OF CASING NA				WAT		FIRS	r	VA.		COMPL. NA 24 HRS. NA
TYPE OF	PERF	ORATION NA	FROM	то	Ft.	1	GGED B	Y:				CHECKED BY:
SIZE ANI	D TYP	E OF PACK NA	FROM	то	Ft.	1	C.	Ram	bo		:	
		T	FROM	то		1						
TYPE O	)F	NO.1 NA	FROM	то	Ft.	1						
<del>1</del>		NO. 2 NA				<u></u>		<del>                                     </del>	SAMP	ES		REMARKS
DEPTH (feet)		DI	ESCRIPTION				DEPTH (feet)	rive	Sample Number	Secov. (Feet.)	Blow	(Drill Rate, Fluid Loss, Odor. etc.)
	Aso	haltic concrete + gravel base						OZ	ωz	-	0.	
-		TY SAND (SM) ark grey-brown, damp, fine grain										
			n sano (FILL)					1	F28-1		3	
	DE	ecomes light brown					.	2	-	////	4	}
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4	Bot	ttom of Boring - 5 feet						1				
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BORING		F29					ATION					<u> </u>	
DRILLIN		120	DRILLER	Jasper/Jeff		DATE	STAR	TED		June	14,	, 1990	
		HDSEENT					PLETIC		5.0			SAMPLER 2" Modi California	ified
DRILLIN		CME 45	DRILL BIT				r PLES	DIST		NA.		UNDIST. 3	1 Y Lit
		6" Solid Auger E OF CASING NA	<u> </u>			WATE	ER	FIRS	<del>-</del>	NA		COMPL. NA 24 HRS.	. NA
		FORATION NA	FROM	то	FL.	LEVE	GED B	Υ:				CHECKED BY:	
		PE OF PACK NA	FROM	то	Ft.	1	C.	Ram	nbo				
		T	FROM	то	FL.	1	-						
TYPE (	OF L	NO.1 NA	FROM	то	Ft.	-							
		NO.2 NA				<u>.                                    </u>	T	η	SAMP	LES		REMARKS	
DEPTH (feet)		DE	SCRIPTION				DEPTH (feet)	Drive	Sample Number	Recov. (Feet.)	Blow	(Drill Rate, Fluid Loss, etc.)	Odor,
	Asp	phaltic concrete + gravel base					╡.	1	F29-1		10 5		
1	SIL	TY SAND (SM)	/E11 ( )				.	2	F29-2		3		
-	С	Dark grey-brown, moist, fine grain	(CILL)					+-	29-2	1///	4	-	
4							<u> </u>	3	F29-3		4 6	]	
5							5 -						
]		Bottom of Boring - 5 feet						-					
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Moodwa	ird-Clyde Consultants		PRO						2129	<u>e II No. 30000257.</u>	
BORING NUM	IBER F30	<u> </u>			ELEVA	TION	AND D	ATUI	M 		
DRILLING AG	ENCY HEW Exploration	DRILLER	Jasper/Jeff		DATE	STAR FINISI	TED HED		June	14,	1990
DRILLING EC					COMP	LETIO	N	5.0	)'		SAMPLER 2" Modified California Type
DRILLING MI		DRILL BIT			NO. OI SAMPI	F :	DIST.	N	ΙA	_	UNDIST. 2
SIZE AND TY	PE OF CASING NA				WATE	R	FIRS1	· I	VA		COMPL. NA 24 HRS. NA
TYPE OF PER		FROM	TO	FL.	<del>                                     </del>	SED B	Y:				CHECKED BY:
SIZE AND TY	PE OF PACK NA	FROM	то	Ft.	1	C.	Ram	bo			
	NO.1 NA	FROM	то	Ft.	1						
TYPE OF SEAL	NO. 2 NA	FROM	то	Ft.	-						
	NO. 2 NA					AMPL			REMARKS (Drill Rate, Fluid Loss, Odor,		
DEPTH (feet)	DE	SCRIPTION				DEPTH (feet)	Drive Number	Sample Number	Recov. (Feet.)	Blow	etc.)
	sphaltic concrete + gravel base							- V			
	LTY SAND (SM) mottled brown and dark brown, m		(CILL)			-	<del> </del>	_		4	
	mottled brown and dark brown, m	oist, tine grain	(FILL)				1	F30-1		4	
							2	F30-2		4 7	
5 —			<u></u>			5 -					
	Bottom of Boring - 5 feet						-				
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11000110	RING NUMBER F31										<u></u>
BORING NUM	ABER F31					ATION		DATU	M 		
DRILLING AG	HEW Exploration	DRILLER	Jasper/Jeff		DATE	STAR	TED HED		June	14,	, 1990
DRILLING EC	CME 45				COMP	LETIC H	N	5.0	 )'		SAMPLER 2" Modified California Type
DRILLING ME		DRILL BIT			NO. C	F	DIST		NA.		UNDIST. 3
SIZE AND TY	PE OF CASING NA				WATE	R	FIRS	Т	NA		COMPL. NA 24 HRS. NA
TYPE OF PER	REPORATION NA	FROM	то	Ft.		GED B	Y:				CHECKED BY:
SIZE AND TY	PE OF PACK NA	FROM	то	IFL.		C.	Ram	odı			
	NO. 1 NA	FROM	то	Ft.	1						
TYPE OF SEAL	NO. 2 NA	FROM	то	Ft.	1						
	NO.2 IVA	<u> </u>			<u> </u>	1		SAMP	LES		REMARKS
DEPTH (feet)	DES	CRIPTION				DEPTH (feet)	Orive Number	Sample Number	Recov. (Feet.)	Blow Counts	(Drill Rate, Fluid Loss, Odor, etc.)
As	phaltic concrete + gravel base	. — — —				1		F31-1		5	
] sir	_TY SAND (SM) Dark brown, moist, fine grain (FIL	1)							7777	2	
_		<b>-</b> ,				.	2	F31-2		3	
4	becomes lighter brown					.	3	F31-3		3 4	
5 ———						5		<u> </u>	7222	+	
1	Bottom of Boring - 5 feet						]				
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	G NUMI	BER F32					VATION					<u> </u>		
DRILLI	NG AGE		DRILLER	Jasper/Jef	f	DA'	TE STAR	TED		June	∋ 14	, 1990		
DRILLI	NG EQL	UIPMENT CME 45			<del></del>	COI	MPLETIC PTH		5.0	D'		SAMPLER	2" Modi alifornia	ified
DRILLI	ING ME	THOD	DRILL BIT		<del>-</del>	NO.	OF MPLES	DIST.	. 1	NA		UNDIST.	2	<u> </u>
SIZE A	ND TYP	6" Solid Auger PE OF CASING NA				WA	TER	FIRS	Ť	NA		COMPL. NA	24 HRS.	NA
		FORATION NA	FROM	то	FL	LEV	GGED E	Y:	***			CHECKED B	<u>:</u>	
		PE OF PACK NA	FROM	то		{ ``		Rarr	nbo			:		
		177	FROM	то		┨	0.	1 141	150					
TYPE SEA	OF AL	NO.1 NA	FROM	10	Ft.	-								
		NO. 2 NA	FROM		Г <b>ь</b>	<u> </u>	<del></del>	<del>                                     </del>	SAMP	LES		REMA	RKS	
DEPTH (feet)		DE	SCRIPTION				DEPTH feet)	Drive Number			Blow	·		Odor,
	Asp	ohaltic concrete + gravel base						DZ.	<u> </u>	<del>-</del> -	<u> </u>			
-	SII 2	TY SAND (SM)	and with bride a	nd wood fro	amente			1	<u> </u>	,,,,				
	D. (FIL	ark grey-brown, moist, fine grain _L)	sand with offick a	no wood Ifa	gments			1	F32-1		4	1		
_	be	ecomes brown, with reddish-brow	vn mottling					2			4	1		
5 —							<b>─</b>  5 <b>-</b>		F32-2	////	4			
٦	Bo	ottom of Boring - 5 feet						]						
		out on Denning Transfer												
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	ORING NUMBER F33									Jaia	ge II NO. <u>9000028A</u>
BORING N	NUMBER F33				ELEVA			DATL	JM		
DRILLING	AGENCY HEW Exploration	DRILLER	Jasper/Jeff		DATE	STAR FINIS	TED HED		Jun	e 14	, 1990
DRILLING	EQUIPMENT CME 45	•			COMP		N.	5.	0'		SAMPLER 2" Modified California Type
DRILLING	6" Solid Auger	DRILL BIT			NO. OF	F	DIST	. 1	NA		UNDIST. 3
SIZE AND	TYPE OF CASING NA				WATE	R	FIRS	T	NA		COMPL. NA 24 HRS. NA
TYPE OF F	PERFORATION NA	FROM	то	Ft.	LOGO		Υ:				CHECKED BY:
SIZE AND	TYPE OF PACK NA	FROM	70	Ft.	1	C.	Ram	nbo			
	, NO.1 NA	FROM	то	Ft.	1						
TYPE OF SEAL	NO. 2 NA	FROM	то	Ft.	1						
	NO. 2 IVA		· · · · · · · · · · · · · · · · · · ·		<u> </u>		1	SAMP	LES		REMARKS
Ę.	DE	SCRIPTION				Ŧ	<del></del>	T	Т		(Datti Bara, Eluital Lana, Odan
DEPTH (feet)						DEPT (leet)	Drive Number	Samp	Recov. (Feet.)	Blow	<b>510.</b> ,
	Asphaltic concrete + gravel base			_		_		F33-1		8 7	
	SILTY SAND (SM)  Dark brown, moist, fine grain sand	with debris (FILL)				_	Ļ		<i>m</i>	3	
-	•	,				-	2	F33-2		4	
+	becomes lighter brown				i	-	3	F33-3		3 4	
5						5 —	<u> </u>		7222	-	
	Bottom of Boring - 5 feet				1	_	]				
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BORING NUM	MBER F34		<del></del>		ELEV	ATION	AND	DATL	M			
DRILLING AC		DRILLER	Jasper/Jef		DATE	STAR	TED		June	14	, 1990	
DRILLING EC			<del></del>	<del> </del>	COMP	LETIO		5.0			SAMPLER :	2" Modifiec
DRILLING M		DRILL BIT			NO. O	F	DIST		NA			ifornia Typ 2
SIZE AND TY	PE OF CASING NA		<del></del>		WATE	R :	FIRS	Ť	NA			24 HRS. NA
TYPE OF PER		FROM	то	Ft.		GED B	Y:				CHECKED BY	
SIZE AND TY	PE OF PACK NA	FROM	то	Ft.		C.	Rarr	nbo			:	
TYPE OF	NO.1 NA	FROM	то	Ft.								
SEAL	NO.2 NA	FROM	то	FL								
						T		SAMP	LES		ЯЕМАЯ	
(feet)	DESCRIPTION Head Drive ( (see t) )								Recov. (Feet.)	Blow	(Drill Rate, Flu etc.)	id Loss, Odor.
5	TY SAND (SM) Dark grey-brown, dry, fine grain so becomes lighter brown some clay Ottom of Boring - 5 feet	and with debris	(FILL)			15		F34-1		3 3 5		



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BORING NUM	BER F35		1		AND	DATU	JM.				
DRILLING AG	ENCY HEW Exploration	DRILLER	Jasper/Jeff		DATE	STAF	HED		Juni	е 14	, 1990
DRILLING EQ	UIPMENT CME 45				COM	PLETIC TH	ON	5.0	0'		SAMPLER 2" Modified California Type
DRILLING ME		DRILL BIT			NO. C	OF PLES	DIST	1	NA		UNDIST. 3
SIZE AND TY	PE OF CASING NA				WAT	ER	FIRS	٣	NA		COMPL. NA 24 HRS. NA
TYPE OF PER		FROM	то	IFt.	<del></del>	GED I	: 3Y:				CHECKED BY:
SIZE AND TY		FROM	то	Fi.		С	. Ran	nbo			
TYPE OF	NO.1 NA	FROM	ro	Ft.	1						
SEAL	NO. 2 NA	FROM	то	Ft.	1						
					J	Τ		SAMP	LES		REMARKS
DEPTH (feet)	DES	CRIPTION				DEPTH (feet)	Drive Number	Sample	Recov. (Feet.)	Blow	(Drill Rate, Fluid Loss, Odor, etc.)
	phaltic concrete + gravel base					1	1	F35-1		8	
SIL	TY SAND (SM) ark brown, with fine gravel, damp	(FILL)					]		7777	1 3	
1 1	becomes brown, damp						2	F35-2		3	
-							3	F35-3		3 6	
5	,					5 -	1		7777	-	
Bo	ottom of Boring · 5 feet										
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BORIN	G NUM	BER F36				ELEV	ATION	AND	DATU	M		
DRILLI	NG AG	ENCY HEW Exploration	DRILLER	Jasper/Jeff		DATE	STAR	TED HED		June	e 14	, 1990
DRILLI	NG EQ	UIPMENT CME 45			,	COMP	PLETIC	N	5.0	0,	-	SAMPLER 2" Modified California Type
DRILL	ING ME		DRILL BIT			NO. C	)F :	DIST	. 1	VA.		UNDIST. 2
SIZE A	ND TYP	PE OF CASING NA				WATE	R	FIRS	T	NA		COMPL. NA 24 HRS. NA
TYPE C	F PER	FORATION NA	FROM	то	Ft.	LEVE	GED B	Y:				CHECKED BY:
SIZE A	ND TYP	PE OF PACK NA	FROM	то	Ft.	1		Ram	aho			
		T	FROM	то	Ft.	-	0.	Han	100			
TYPE SE	OF AL	NO.1 NA				-						
Ĺ		NO.2 NA	FROM	10	Ft.			+				
								<u></u>	BAMP	,	Ι.	REMARKS (Drill Rate, Fluid Loss, Odor,
DEPTH (feet)		DES				E G	Orive Number	ample Fundament	Feet.)	3low ounts	etc.)	
	Asp	ohaltic concrete + gravel base					36	<u> </u>	ΰŻ	-	ن =	
		TY SAND (SM)			_		] -	1				
	В	rown, damp to moist, fine grain sar	nd (FILL)				_	1	F36-1		4	
							-	<u> </u>			4	
5 —							<b> </b> 5 −	2	F36-2		6	
-	Bot	tom of Boring - 5 feet					-	-				
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****	DRING NUMBER 527							JEC I NA	.m	<u> </u>	<u> </u>	J. U	u at	4 <u>8 II</u> 140	JUCCOLOT.
BORING	NUMB	ER	F37					ELEVA			DATU	М			
DRILLIN	G AGE	NCY HE	EW Explorati	ion	DRILLER	Jasper/Jeff		DATE I	FINIS	HED		June	14,	1990	
DRILLIN			CME 45					COMPL	l		5.0	)'		<u>Ca</u>	2" Modified difornia Type
DRILLIN			S" Solid Auge	er	DRILL BIT			NO. OF	ES :	DIST		NA	•	UNDIST.	3
		E OF CASING	NA NA					LEVEL	3	FIRS	T	NA		COMPL. NA	24 HRS. NA
		ORATION	NA		FROM	то	Ft.	LOGG						CHECKED B	<b>Y</b> :
SIZE AN	ID TYPI	E OF PACK	NA		FROM	то	Ft.	<u> </u>	C.	Ram	bo				
TYPE (			IA IA		FROM	TO	FL FL								
		10.2			<u> </u>			<u></u>		. :	SAMPL	.ES		REMA	
DEPTH (feet)				DESCRI	PTION				DEPTH (feet)	Drive Number	ample tumber	Recov. (Feet.)	Blow	(Drill Rate, Fi etc.)	uid Loss, Odor,
	Asp	haltic conci	rete + gravel	l base							F37-1		10 12		
	SILI	Y SAND (3 ottled dark b	SM) prown and oi	range-brown,	moist, fine g	ırain (FILL)			_	2	F37-2	077	10		
-	bed	comes orai	nge-brown						-	-	137-2	////	11		
5 —						·			5 —	3	F37-3		<u>4</u> 5		
,	Во	ittom of Bo	ring - 5 feet						٠ -						
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BORIN	IG NUME	BER F38				ELEV	ATION	AND	DATU	M			
DRILL	ING AGE		DRILLER	Jasper/Jef	 f	DATE	STAR	TED HED		June	e 14	, 1990	
DRILL	ING EQU	IPMENT CME 45		·			LETIC		5.0	),		SAMPLER 2" Modifi California	fied Type
DRILL	ING MET		DRILL BIT			NO. C	F :	DIST	· N	۱A		UNDIST. 2	· Y P.G.
SIZE A	ND TYP	E OF CASING NA	I			WATE	R	COMPL. NA 24 HRS.	NA				
TYPE (	OF PERF	ORATION NA	FROM	то	Pt.	T	GED B	CHECKED BY:					
SIZE A	AND TYP	E OF PACK NA	FROM	то	Ft.		C.	. Ram	bo				
TYPE		NO.1 NA	FROM	то	Ft.								
SE	AL	NO.2 NA	Ft.			<b>.</b>			,				
r								<b>_</b>	AMPL B T			REMARKS (Drill Rate, Fluid Loss, C	dor,
DEPTH (feet)			DESCRIPTION				DEPTH (leet)	Drive Number	Sample	Recov.	Blow	etc.)	•
	Asp	haltic concrete + gravel base					1	1	41.2		٦		
	SIL'	TY SAND (SM) ark grey-brown, damp, with gr	avel (FILL)				-	1_		<i>m</i>	6		
-		ecomes lighter brown					-	1	F38-1		9		
5 —							5 -	2	F38-2		3_4		
3 <del>-</del>	D	ottom of Boring - 5 feet				<del></del>	-	4					
_	8	ottom or boning - 5 leet					-	-					
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BORIN	BORING NUMBER F39										ELEVATION AND DATUM							
	ING AGE		łEW Explo	oration		DRILLER	Jasper/Jef	i	DA.	TE ST	NISH	1ED		June	14	, 1990		
DRILL	ING EQU	IPMENT	CME 45						DE	MPLE PTH	TIO	N	5.0	),		sampler 2 Calif	" Modified ornia Type	
DRILL	ING MET	HOD	6" Solid A	uger	·	DRILL BIT			NO.	OF MPLES	s	DIST	. 1	NΑ		UNDIST.		
SIZE A	ND TYP	E OF CASI	NG NA	١					WA LEV	TER /EL		FIRS	T	NA		COMPL. NA	4 HRS. NA	
TYPE	OF PERF	ORATION	NA			FROM	то	Ft.		GGE	D B	Y:				CHECKED BY:		
SIZE A	ND TYP	E OF PACK	NA			FROM	то	FL.			C.	Ram	bo					
ТУРЕ	OF	NO. 1	NA			FROM	то	Ft.										
SE	AL	NO. 2	Ft.															
I													SAMPI	_		REMARK (Drill Rate, Fluid		
DEPTH (feet)					DESCRI	PTION				DEPTH	(leet)	Drive Number	Sample	Recov. (Feet.)	Blow Counts	etc.)		
	A <u>sp</u>	ha <u>ltic con</u>	crete + gra	av <u>el</u> ba <u>s</u> e					_	$\exists$			F39-1		5 6			
_	SIL1 Da	Y SAND	(SM) , moist, wit	th brick f	ragments	(FILL)					4	2	F39-2		3			
-						,					+			222	4_			
5 <del>-</del>						•				5		3	F39-3		<u>4</u> 5			
, –	Bot	tom of Bo	oring - 5 fe	et							4							
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BORING NUMBER F40							ELEVATION AND DATUM							
DRILLIN	IG AGE	NCY HEW Exploration		DRILLER	Jasper/Jeff		DATE DATE	FINIS	HED		June	⊋ 14	, 1990	
DRILLIN	IG EQU	IPMENT CME 45					COMP	H		5.0	)'		SAMPLER 2" Modified California Type	
DRILLIN		6 Solid Auger		DRILL BIT			NO. OI SAMPI	LES	DIST	- 1	NA.		UNDIST. 2	
SIZE AN	ID TYPE	e of casing NA					WATE.	R -	FIRS	Τ	NA		COMPL. NA 24 HRS. NA	
TYPE O	FPERF	ORATION NA		FROM	то	Ft.	LOGO	GED B	3 <b>Y</b> :				CHECKED BY:	
SIZE AN	ID TYPI	E OF PACK NA		FROM	то	Ft.		C.	. Ram	nbo				
TYPE	OF .	NO.1 NA		FROM	то	Ft.								
SEA	L	NO. 2 NA		FROM	TO	Ft.								
+									ļ	SAMPL			REMARKS (Drill Rate, Fluid Loss, Odor,	
DEPTH (feet)			DESCRI	PIION					Drive Number	Sampk	Recov. (Feet.)	Blow	etc.)	
-	A <u>sp</u> l	ha <u>ltic concrete</u> + <u>gr</u> av <u>el</u> bas	<u> </u>					-						
4	SILT Da	Y SAND (SM) irk brown, moist, fine grain	(FiLL)					-	1	F40-1	7//	4		
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Woodwa	woodward-Ciyde Consultants					PROJECT NAME City Center Garage II No. 90C002						
BORING NUI	MBER F41		ELEVATION AND DATUM									
DRILLING AC	GENCY HEW Exploration	DRILLER	Jasper/Jeff		DATE STAF	RTED	June 1	4, 1990				
DRILLING EC		. <u>.                                   </u>	, <u></u>		COMPLETION		) <sup>'</sup>	SAMPLER 2" Modified California Type				
DRILLING M		DRILL BIT			NO. OF SAMPLES	DIST.	٧A	UNDIST. 3				
SIZE AND TY	PE OF CASING NA				WATER LEVEL	FIRST	NA NA	COMPL. NA 24 HRS. NA				
TYPE OF PER		FROM	то	Ft.	LOGGED	<del></del>		CHECKED BY:				
SIZE AND TY	PE OF PACK NA	FROM	10	Ft.	l c	. Rambo						
	NO.1 NA	FROM	то	Ft.	1							
TYPE OF SEAL	NO. 2 NA	FROM	то	Ft.	-							
<del></del>	140.2 14A		<del></del>		<u> </u>	SAMP	ES	REMARKS				
DEPTH (feet)	DE	SCRIPTION			E	the sta	3 <del>1</del> 2 3	(Drill Rate, Fluid Loss, Odor, etc.)				
i					G E	Drive Number Sample Number	5 6 8					
	phaltic concrete + gravel base					<b>1</b> F41-1	10 12	<u>.                                      </u>				
- Si	LTY SAND (SM) Dark brown, moist, fine grain sand	(FILL)			1	2 F41-2	7					
4	becomes lighter brown					<del>                                     </del>	7	1				
_					5 -	3 F41-3	5 14					
5	3ottom of Boring - 5 feet											
	Soliding of Coll					-						
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BORING NUI	DRING NUMBER F42						ELEVATION AND DATUM						
DRILLING A	GENCY HEW Exploration	DRILLER	Jasper/Jeff	,,,	DATE	STAR	TED HED		June	e 14	, 1990		
DRILLING E	OME 45				COMPLETION 5.0'						SAMPLER 2" Modified California Type		
DRILLING M		DRILL BIT			NO. O	F Les	DIST		NA		UNDIST. 2		
SIZE AND TY	PE OF CASING NA				WATE	R	FIRS	T	NA		COMPL. NA 24 HRS. NA		
TYPE OF PE	REPORATION NA	FROM	το	Pt.		GED B	Y:			CHECKED BY:			
SIZE AND T	PE OF PACK NA	FROM	то	Ft.		C.	. Ram	nbo					
TYPE OF	NO.1 NA	FROM	то	FL	1								
SEAL	NO. 2 NA	FROM	то	Ft.									
_			. ,,	· · · · · ·	1		<b></b>	SAMP	1		REMARKS (Drill Rate, Fluid Loss, Odo;		
DEPTH (feet)	DES	CRIPTION				DEPTH (feet)	Drive Number	ample	Recov.	Blow	etc.)		
A	sphaltic concrete + gravel base							<u> </u>					
] si	LTY SAND (SM) Dark grey-brown, damp, fine grain sa	- (C11.1)				-	<u> </u>		777	6			
'		and (FILL)				.	1	F42-1		ě			
4	becomes lighter brown						2	F42-2		7			
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]	Bottom of Boring - 5 feet		•			.	-						
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BORING N			F43						EVATIO						<u> </u>			
DRILLING		1	W Exploratio	n	DRILLER	Jasper/Jeff		DA	TE STA	RTE	D		June	 е 14	, 1990			
DRILLING		IDMENT	·····		1			co	MPLET			5.0			SAMPLE	2"	Modi	fiecl
DRILLING	MET	HOD	CME 45	<u></u>	DRILL BIT	<u> </u>		NO	PTH . OF	D	IST.		NA		UNDIST.	Califo 3	rnia	ıyıye
SIZE AND	TYPE	6 OF CASING	" Solid Auger NA		1			WA	MPLES TER		IRS1	<u> </u>	NA		COMPL.		HRS.	NA
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		E OF PACK	NA NA		FROM	то	FL.	"		- ·· C. R		ho						
		Alo d N	<del></del>		FROM	то	Ft.			J. 1 1	<b>W</b> 111							
TYPE OF SEAL		NO.1 N		· · · · · · · · · · · · · · · · · · ·	FROM	то	FL											
		NO. 2 N	IA								s	AMP	LES		R	EMARKS		
₹a				DESCR	IPTION				Ε	_				_ 2		te, Fluid I		Odo⊹,
DEPTH (feet)									DEP		툊	Sam	Recov. (Feet.)	Blow	,			
			ete + gravel b	a <u>se</u>					4			F43-1		5				
	SiL i Da	Y SAND (S rk brown, d	amp, fine grai	n (FILL)						+	2	F43-2		4				
4	b	ecomes lig	hter brown							+	-	F43-2	1///	5				
-									_	+	3	F43-3		4 8				
5									5	1								
	В	ottom of Bo	ring - 5 feet						-	4								
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BORING NUMB	ER F44				ELEVA	ATION	AND	DATU	M					
DRILLING AGE	nev exploration	DRILLER	Jasper/Jeff		DATE DATE	FINIS	HED		June	∋ 14	, 1990			
DRILLING EQU	IPMENT CME 45				COMP DEPTI	4	>N	5.0	)'		SAMPLER 2" Modified California Type			
DRILLING MET	HOD 6" Solid Auger	DRILL BIT			NO. OI	LES	DIST	. 1	٧A		UNDIST. 2			
SIZE AND TYP	FOF CASING NA				WATE	R	FIRS	Τ	NA		COMPL. NA 24 HRS. NA			
TYPE OF PERF	ORATION NA	FROM	то	FŁ	LOGG	SED B	Y:				CHECKED BY:			
SIZE AND TYP	E OF PACK NA	FROM	то	FL.		C.	Ran	nbo						
TYPE OF	NO.1 NA	FROM	то	Ft.							:			
SEAL	NO. 2 NA	FROM	то	Ft.										
_								SAMPI			REMARKS (Drill Rate, Fluid Loss, Odor,			
DEPTH (feet)	DESCRI	PTION				DEPTH (feet)	Drive Number	Sample	Recov. (Feet.)	Blow Counts	etc.)			
	haltic concrete + gravel base			_		-	-							
- SiL Di	TY SAND (SM) ark brown, damp to moist, fine grain	(FILL)				-	1	F44-1		3				
- b	ecomes light brown to brown					-	<u> </u>		7222	-3-				
5 —						5 -	2	F44-2		3 5				
	Bottom of Boring - 5 feet					-	1							
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Woodward-Clyde (	Consultants
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BORING	NUMBER F45			<del>.</del>	ELEVAT	ON A	ND I	UTAC	М			
DRILLING	G AGENCY HEW Exploration	DRILLER	Jasper/Jef	f	DATE ST	ART NISH	ED ED		June	14	, 1990	
DRILLING	G EQUIPMENT CME 45				COMPLE		-	5.0			SAMPLER	2" Modified alifornia Type
DRILLING	G METHOD 6" Solid Auger	DRILL BIT			NO. OF	s [	DIST.	<u> </u>	۱A		UNDIST.	3
SIZE AND	TYPE OF CASING NA	· · · · · · · · · · · · · · · · · · ·			WATER LEVEL		FIRS	ī	NA		COMPL. NA	24 HRS. NA
TYPE OF	PERFORATION NA	FROM	то	FL	LOGGE	D BY	<u>-</u> -				CHECKED B	<del>:</del> Y:
SIZE AND	TYPE OF PACK NA	FROM	то	Ft.		C. F	Ram	bo				
TYPE O	NO.1 NA	FROM	то	Ft.								
SEAL		FROM	то	Ft.	1							
<del></del>							AMPL			REMA		
DEPTH (feet)		DESCRIPTION								Blow	(Drill Rate, F etc.)	luid Loss, Odo <i>r</i> ,
عَدَ	Asphaltic concrete + gravel b	350				(leet)		6 2 6 2 F45-1	2 E	<b>නි</b> ප් 5 5		·
_	SILTY SAND (SM) Dark grey-brown, damp, fine				- 1	+	1	F45-1		5_		
		grain (FILL)					2	F45-2		3		
	becomes lighter brown					_			777	5		
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$\dashv$	Bottom of Boring - 5 feet					4						
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#### APPENDIX B

#### CHEMICAL ANALYTICAL RESULTS

#### Contents:

- 1) Pre-aeration Samples
- 2) Post-aeration Samples
- 3) Fill Samples
  - a) Stockpile Samples
  - b) Boring Samples
  - c) Surface Samples
  - d) Test Pit and Stockpile Samples
- 4) Gasoline Excavation Samples
- 5) Groundwater Samples
- 6) Closure Samples
  - a) Gasoline Excavation
  - b) Fill Area

я́-90 FRI 15:57 415-831-8798

## CHROMALAB, INC.

Analytical Laboratory Specializing in GC-GC/MS 3203

Environmental Analysis

Hazardous Waste (#238)

• Drinking Water (#955)

Waste Water

Consultation

April 20, 1990

Chromatab File No.:

0490068

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: George Ford

RE: Seven rush soil samples for Gasoline/BTEX, Oil & Grease, and Total Lead analyses

Project Number: 90C0028A

Duration of Analysis: April 18-20, 1990

#### RESULTS:

				Ethyl	Total	Oil &	
Sample	Gasoline						Lead
No.	(mg/Kg)	(µg/Kg) (	ца/Ка) (	<u>µg/Kg) (</u>	<u>ug/Kg) (</u> (	mg/Kg) (	mg/Kg)
-							
DT-1	N.D.	N.D.	12	11	88	N.D.	5.0
DT-2	N.D.	N.D.	7.5	5.0	42	N.D.	7.6
DT-3	24	N.D.	150	240	2300	N.D.	10
CN-1	61	7.4	110	420	840	N.D.	14
CN-2	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	29
CN-3	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	7.1
CN-4	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	6.8
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE							
RECOVERY	102.5%	92.8%	98.3%	99.6%	95.2%		96.4%
DETECTION							
LIMIT	2.5	5	5	5	5	50	0.1
METHOD OF	MOD.					503	
ANALYSIS	8015	8020	8020	8020	8020	D&E	7420

ChromaLab, Inc.

David Duong

Senior Chemist

Eric Tam

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

• Hazardous Waste (#238)

Drinking Water (#955)

Waste Water

Consultation

May 1, 1990

ChromaLab File No.: 0490102

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: George Ford

RE: Five soil samples for Gasoline/BTEX analysis

Project Number: 90C0028A

Duration of Analysis: April 26-May 1, 1990

#### RESULTS:

Camp. C	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)
NO. DT-4 DT-5 DT-6 DT-7 DT-8	7.7 N.D. 61 850 N.D.	N.D. N.D. 8.3 85 N.D.	N.D. N.D. 20 7700 N.D.	N.D. 23 17000 N.D.	N.D. N.D. 140 32000 N.D.
BLANK SPIKE RECOVERY DETECTION LIMIT METHOD OF	N.D. 88.1% 7 2.5	N.D. 83.2% 5.0	N.D. 87.7% 5.0	N.D. 86.1% 5.0	N.D. 81.6% 5.0
ANALYSIS MO	DD.8015	8020	8020	8020	8020

ChromaLab, Inc.

David Buong

Senior Chemist

Éric Tam

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

 Hazardous Waste (#238)

 Drinking Water (#955)

Waste Water

Consultation

April 26, 1990

ChromaLab File No.: 0490102

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Greg Ford

RE: Nine rush soil samples for Gasoline/BTEX and Total Lead analyses

Project Number: 90C0028A

Duration of Analysis: April 24-26, 1990

RESULTS: Sample	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (ug/Kg)	Total Xylenes (µg/Kg)	Total Lead (mg/Kg)
CN-5 CN-6 CN-7 CN-8 CN-9 CN-10 CN-11 CN-12 CN-13	N.D. N.D. N.D. N.D. N.D. 22 N.D. N.D. N.	N.D. N.D. N.D. N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D. 9.8 N.D. N.D.	N.D. N.D. N.D. N.D. N.D. N.D. N.D. N.D.	6.4 3.5 5.9 2.3 6.6 5.7 4.4 4.5 3.8
BLANK . SPIKE	N.D.	N.D.	N.D.	N.D.	N.D. 95.2%	N.D. 99.4%
RECOVERY DETECTION LIMIT METHOD OF ANALYSIS	102.5% 2.5 MOD. 8015	92.8% 5 8020	98.3% 5 8020	99.6% 5 8020	5 8020	0.1 3005/ 7420

ChromaLab, Inc.

Senior Chemist

Eric Tam

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

• Hazardous Waste (#238)

• Drinking Water (#955)

Waste Water

Consultation

May 1, 1990

ChromaLab File No.: 0490120

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: George Ford

RE: Twenty-three rush soil samples for Gasoline/BTEX analysis

Project Number: 90C0028A

Duration of Analysis: April 29-May 1, 1990

#### RESULTS:

Sample No.	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)
CN-14	N.D.	N.D.	N.D.	N.D.	N.D.
CN-15	N.D.	N.D.	N.D.	N.D.	N.D.
CN-16	N.D.	N.D.	N.D.	N.D.	N.D.
CN-17	N.D.	N.D.	N.D.	N.D.	N.D.
CN-18	N.D.	N.D.	N.D.	N.D.	N.D.
CN-19	3.2	N.D.	N.D.	N.D.	N.D.
CN-20	N.D.	N.D.	N.D.	N.D.	N.D.
CN-21	N.D.	N.D.	N.D.	N.D.	N.D.
CN-22	N.D.	N.D.	N.D.	N.D.	N.D.
CN-23	N.D.	N.D.	N.D.	N.D.	N.D.
CN-24	N.D.	N.D.	N.D.	N.D.	N.D.
CN-25	N.D.	N.D.	N.D.	N.D.	N.D.
CN-26	N.D.	N.D.	N.D.	N.D.	N.D.
CN-27	N.D.	N.D.	N.D.	N.D.	N.D.
CN-28	N.D.	N.D.	N.D.	N.D.	N.D.
CN-29	N.D.	N.D.	N.D.	N.D.	N.D.
CN-30	N.D.	N.D.	N.D.	N.D.	N.D.
CN-31	N.D.	N.D.	N.D.	N.D.	N.D.
CN-32	N.D.	N.D.	N.D.	N.D.	N.D.
CN-33	N.D.	N.D.	N.D.	N.D.	N.D.
DT-9	N.D.	N.D.	N.D.	N.D.	N.D.
DT-10	N.D.	N.D.	N.D.	N.D.	N.D.
DT-11	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY DUPLICATED SPIK	84.0%	105.5%	101.7%	81.7%	88.1%
RECOVERY	92.4%	111.8%	110.4%	98.5%	98.7%
DETECTION LIMIT		5.0	5.0	5.0	5.0
METHOD OF					
	D.8015	8020	8020	8020	8020

ChromaLab, Inc.

David Duong

Senior Chemist

Eric Tam

Analytical Laboratory
Specializing in GC-GC/MS

Environmental Analysis

Hazardous Waste (#238)

Drinking Water

(#955)

Waste Water

Consultation

May 14, 1990

ChromaLab File No.: 0590040

Page 1 of 2

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: George Ford

RE: Thirty soil samples for Gasoline/BTEX, Oil & Grease, Total

Lead, and Wet Lead analyses

Project Number: 90C0028A

Date Sampled: May 4, 1990 Date Submitted: May 4, 1990

Duration of Analysis: May 4-12, 1990

RESULTS:

				Ethyl	Total	Oil &	TTLC	STLC
Sample	Gasoline	Benzene	Toluene	Benzene	Xylenes	Grease	Lead	Lead
No.	(mg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(mg/Kg)	(mg/Kg)	(mg/L)
DT 12	N.D.	19	15	N.D.	8.1			
DT 13	7 1	34	150	170	800			
DT 14	390	150	450	830	3100			
DT 15	<b>5</b> 5	N.D.	N.D.	7.2	39			
DT 16	1000	800	3200	4100	12000			
DT 17	27	Ŋ.D.	N.D.	7.3	120			
FL 9		·				N.D.	55	0.7
FL 10						N.D.	74	0.6
FL 11						N.D.	37	0.2
FL 12						N.D.	78	0.5
FL 13						N.D.	42	0.5
FL 14						N.D.	51	0.6
FL 15	-					100	47	0.6
FL 16						61	86	0.8
BTM 1	N.D.	5.4	N.D.	N.D.	N.D.			
BTM 2	38	24	6.2	16	300			
BTM 3	47	370	180	170	460			
BTM 4	N.D.	N.D.	N.D.	N.D.	N.D.			
BTM 5	45	330	96	32	390			
BTM 6	N.D.	75	40	N.D.	33			
BTM 7	21	390	430	180	400			
BTM 8	N.D.	N.D.	N.D.	N.D.	N.D.			
BTM 9	N.D.	32	5.1	N.D.	5,0			

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Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

• Hazardous Waste (#238)

• Drinking Water (#955)

Waste Water

Consultation

May 16, 1990

ChromaLab File No.: 0590062

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: George Ford

RE: Eight soil samples for Gasoline/BTEX analysis

Project Number: 90C0028A

Date Sampled: May 8, 1990 Date Submitted: May 8, 1990 Date Extracted: May 12-14, 1990 Date Analyzed: May 12-14, 1990

#### **RESULTS:**

				Ethy1	Total
Sample	Gasoline	Benzene	Toluene	Benzene	Xylenes
No.	(mg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)
DT-18	N.D.	N.D.	N.D.	N.D.	N.D.
DT-19	N.D.	N.D.	N.D.	N.D.	N.D.
DT-20	N.D.	N.D.	N.D.	N.D.	N.D.
DT-21	N.D.	N.D.	N.D.	N.D.	N.D.
DT-22	3.6	N.D.	N.D.	N.D.	N.D.
DT-23	N.D.	N.D.	N.D.	N.D.	N.D.
DT-24	110	93	110	65	280
DT-25	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	90.4%	99.5%	108.4%	92.7%	94.7%
DUP. SPIKE					
RECOVERY	95.2%	91.4%	88.2%	99.6%	109.5%
DETECTION LIMIT	T 2.5	5.0	5.0	5.0	5.0
METHOD OF					
ANALYSIS M	DD.8015	8020	8020	8020	8020

ChromaLab, Inc.

David Duong Senior Chemist Eric Tam

Analytical Laboratory
Specializing in GC-GC/MS
April 20, 1990

Environmental Analysis

Hazardous Waste (#238)

Drinking Water

(#955)

Waste Water

Chromatab File # 0490068C

Client: Woodward-Clyde Consultants Attn: George Ford Date Submitted: April 18, 1990 Date of Analysis: April 20, 1990 Project No: 90C0028A Sample I.D.: DT-3 Method of Analysis:\_\_\_ EPA 8240 Detection Limit: 10 µg/Kg ug/Kg Spike Recovery COMPOUND NAME N.D \_ ... CHLOROMETHANE VINYL CHLORIDE N.D. 99.8% BROMOMETHANE N.D. CHLOROETHANE N.D. TRICHLOROFLUOROMETHANE N.D. 1,1-DICHLOROETHENE N.D. 84.4% METHYLENE CHLORIDE N.D. 1,2-DICHLOROETHENE (TOTAL) N.D. 1,1-DICHLOROETHANE N.D. CHLOROFORM N.D. 1,1,1-TRICHLOROETHANE N.D. N.D. CARBON TETRACHLORIDE N.D. 93.1% BENZENE 1.2-DICHLOROETHANE N.D. N.D. TRICHLOROETHENE N.D. 1.2-DICHLOROPROPANE BROMODICHLOROMETHANE N.D.

N.D.

N.D.

150

N.D.

1,1,2-TRICHLOROETHANE N.D. N.D. TETRACHLOROETHENE DIBROMOCHLOROMETHANE N.D. 90.9% CHLOROBENZENE N.D. ETHYL BENZENE 240 N.D. BROMOFORM 1,1,2,2-TETRACHLOROETHANE N.D. N.D. 1,3-DICHLOROBENZENE 83.9% N.D. 1.4-DICHLOROBENZENE 1.2-DICHLOROBENZENE N.D. TOTAL XYLENES 2300

ChromaLab, Inc.

TOLUENE

2-CHLOROETHYLVINYLETHER

CIS-1,3-DICHLOROPROPENE

TRANS-1,3-DICHLOROPROPENE

David Duong Senior Chemist Eric Tam Lab Director

Analytical Laboratory
Specializing in GC-GC/MS
April 20, 1990

Environmental Analysis

Hazardous Waste (#238)

Drinking Water (#955)

Waste Water

ChromaLab File Consultation 04900688

Client: Woodward-Clyde Consultants	Attn: <u>George Ford</u>
Date Submitted: <u>April 18. 1990</u> Date of Analysis: <u>April 20. 1990</u>	
Project No: 90C0028A	

Sample I.D.: DT-2
Method of Analysis: EPA 8240 Detection Limit: 10 us/

Method of Analysis: <u>EPA 82</u>	40	Detection Limit: 10 µg/Kg
COMPOUND NAME	ug/Kg	Spike Recovery
CHLOROMETHANE	N.D	
VINYL CHLORIDE	N.D.	99.8%
BROMOMETHANE	N.D.	
CHLOROETHANE	N.D.	
TRICHLOROFLUOROMETHANE	N.D.	<b></b>
1,1-DICHLOROETHENE	N.D.	84.4%
METHYLENE CHLORIDE	N.D.	Min was the
1,2-DICHLOROETHENE (TOTAL)	N.D.	dess vais 1 <sub>8</sub> tis
1,1-DICHLOROETHANE	N.D.	The 4th run
CHLOROFORM	N.D.	
1,1,1-TRICHLOROETHANE	N.D.	
CARBON TETRACHLORIDE	N.D.	We wan app
BENZENE	N.D.	93.1%
1,2-DICHLOROETHANE	N.D.	
TRICHLOROETHENE	N.D.	and the same
1,2-DICHLOROPROPANE	N.D.	
BROMODICHLOROMETHANE	N.D.	No. ORE THE
2-CHLOROETHYLVINYLETHER	N.D.	<b>■</b> •••
TRANS-1,3-DICHLOROPROPENE	N.D.	
TOLUENE	N.D.	We have we
CIS-1,3-DICHLOROPROPENE	N.D.	Will day too.
1,1,2-TRICHLOROETHANE	N.D.	
TETRACHLOROETHENE	N.D.	No. of the Control of
DIBROMOCHLOROMETHANE	N.D.	The Mark The Park
CHLOROBENZENE	N.D.	90.9%
ETHYL BENZENE	N.D.	<b></b>
BROMOFORM	N.D.	₩ == =:
1,1,2,2-TETRACHLOROETHANE	N.D.	** = ~.
1,3-DICHLOROBENZENE	N.D.	
1,4-DICHLOROBENZENE	N.D.	83.9%
1,2-DICHLOROBENZENE	N.D.	
TOTAL XYLENES	42	*

ChromaLab, Inc.

Pavid Duong Senior Chemist Eric Tam Lab Director

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

Hazardous Waste

(#238)

Drinking Water

(#955)

Waste Water

Consultation

April 20, 1990

ChromaLab File # 0490068A

Client: Woodward-Clyde Consultants Attn: George Ford

Date Submitted: April 18, 1990 Date of Analysis: April 20, 1990

Project No: 90C0028A

Sample I.D.: DT-1

Method of Analysis: Detection Limit: 10 µg/Kg

COMPOUND NAME	ug/Kg	Spike Recovery
CHLOROMETHANE	N.D	tent age age
VINYL CHLORIDE	N.D.	99.8%
BROMOMETHANE	N.D.	um Am um
CHLOROETHANE	N.D.	tres one mak
TRICHLOROFLUOROMETHANE	N.D.	Nation - Saide - Saide
1,1-DICHLOROETHENE	N.D.	84.4%
METHYLENE CHLORIDE	N.D.	
1,2-DICHLOROETHENE (TOTAL)	N.D.	ED 100 mad
1,1-DICHLOROETHANE	N.D.	the same
CHLOROFORM	N.D.	true same denta
1,1,1-TRICHLOROETHANE	N.D.	<b>40</b> 444 4
CARBON TETRACHLORIDE	N.D.	*** ****
BENZENE	N.D.	93.1%
1,2-DICHLOROETHANE	N.D.	Arab Azar plağı
TRICHLOROETHENE	N.D.	The way down
1,2-DICHLOROPROPANE	N.D.	## ### <del>****</del>
BROMODICHLOROMETHANE	N.D.	
2-CHLOROETHYLVINYLETHER	N.D.	max may deter
TRANS-1,3-DICHLOROPROPENE	N.D.	-
TOLUENE	12	And that there
CIS-1,3-DICHLOROPROPENE	N.D.	MA 440 440
1,1,2-TRICHLOROETHANE	N.D.	the true design
TETRACHLOROETHENE	N.D.	-
DIBROMOCHLOROMETHANE	N.D.	We do ma
CHLOROBENZENE	N.D.	90.9%
ETHYL BENZENE	11	990 Bar whi
BROMOFORM	N.D.	in an
1,1,2,2-TETRACHLOROETHANE	N.D.	Wil 41 day
1,3-DICHLOROBENZENE	N.D.	= = ·
1,4-DICHLOROBENZENE	N.D.	83.9%
1,2-DICHLOROBENZENE	N.D.	<del>-</del>
TOTAL XYLENES	88	<b>-</b>

ChromaLab, Inc.

Duong Duong Senior Chemist

Eric Tam Lab Director



### MOBILE CHEM LABS INC.

1678 Reliez Valley Road Lafayette, CA 94549 • (415) 945-1266

Chromalab Inc. 2239 Omega Road San Ramon, CA 94583 Attn: Eric Tam

Date Sampled:04-30-90 Date Received:04-30-90 Date Reported:05-01-90

#### ORGANIC LEAD

Sample Number	Sample Description	Detection Limit	Sample Results	
		b.bm	bbū	÷
	Proj. # 04901	02-120		:
			•	í
B040172	DT-6	0.010	ND	i
B040173	DT-9	0.010	ND	!
B040174	CN-14	0.010	ND	
B040175	CN-18	0.010	ND	
B040176	CN-30	0.010	ND	

QA/QC: \* Spike Recovery is 108%

Preformed on Sample # B040176

Note: Analysis - California LUFT Manual, 12/87

MOBILE CHEM LABS

Renato G Evans Lab Director

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

(#238) Hazardous Waste

(#955) . Drinking Water

. Waste Water

Consultation

May 21, 1990

ChromaLab File No.:

0590130

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: George Ford

RE: Five rush soil samples for Gasoline/BTEX and Total Lead analyses

Project Number: 90C0028A Date Sampled: May 18, 1990

Date Extracted: May 20, 1990

Date Submitted: May 18, 1990 Date Analyzed: May 20-21, 1990

**RESULTS:** 

Sample	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)	Lead (mg/Kg)
SC-1 SC-2 SC-3 SC-4 SC-5 .	N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D.	6.99 3.54 -7.14 4.62 3.62
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	90.4%	91.4%	88.2%	99.6%	98.7%	89.1%
DUP. SP. RECOVERY	95.2%	96.7%	90.1%	98.5%	109.5%	102.7%
DETECTION LIMIT	2.5	5	5	5 .	5	0.05
METHOD OF ANALYSIS	MOD. 8015	8020	8020	8020	8020	7420

ChromaLab, Inc.

David Duong Senior Chemist Eric Tam

# Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600

### **Chain of Custody Record**

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# Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600

### **Chain of Custody Record**

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#### **Woodward-Clyde Consultants Chain of Custody Record** 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600 PROJECT NO. **ANALYSES** 90COOZ8A Number of Containers Sample Matrix (S)oil, (W)ater, (A)ir **REMARKS** (Sample preservation, EPA Method EPA Method handling procedures, etc.) DATE TIME SAMPLE NUMBER DT 18 f 0119 DT 20 0121 ſ 1 1 = 5 day furnaround OT 25 -

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#### Woodward-Clyde Consultants 500 12th Street. Suite 100, Oakland, CA 94607-4041 (415) 893-3600 **Chain of Custody Record** PROJECT NO. ANALYSES 10 GC 28 A Number of Containers SAMPLERS: (Signature) REMARKS Sample Matrix (S)oil, (W)ater, (A)ir - (Sample preservation, EPA Mathod handling Procedures, etc.) DATE TIME 12 SAMPLE NUMBER l *u*A 2712 - Contie PT 13 DT 14 DT 15 DT 16 =19 1/10 Full 3 George Ford 874-3203 r/2WALLS ! TOTAL NUMBER OF CONTAINERS RECEIVED BY: 3 1/ RECEIVED BY : . DATE/TIME RELINQUISHED BY : RELINQUISHED BY: (Signature) (Signature) (Signature) \ \ i \ atore) DATE/TIME SHIPPED BY : COURIER: METHOD OF SHIPMENT (Signaltre) (Signature)

### **Woodward-Clyde Consultants Chain of Custody Record** 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600 PROJECT NO. 9000028A **ANALYSES** Number of Containers SAMPLERS: (Signature) REMARKS Sample Matrix (S)oil, (W)ater, (A)ir (Sample preservation. EPA Method handling procedures, etc.) DATE SAMPLE NUMBER TIME <u>.</u> 1 Į ( ( turnaround (Monday morning (Monday ble) verbal results - verbal results - to George Ford - to George Ford 874-3203 or 874-3203 874-3192 please

			TO NUMBE CONTAIL					
RELINQUISHED BY: (Signature)  M. Slefa	DATE/TIME 5/18/12:30	RECEIVED BY: (Signature)	RELINQUISHED BY : (Signature)	DATE	E/TIME	RECEIVED BY : (Signature)		
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Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

 Hazardous Waste (#238)

 Drinking Water (#955)

Waste Water

Consultation

May 29, 1990

ChromaLab File No.: 0590191

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

RE: Five rush composited soil samples for Gasoline/BTEX, Diesel, and Oil & Grease analyses

Project Number: 90C0028A

Date Sampled: May 24, 1990 / Date Submitted: May 24, 1990 Date Extracted: May 24-29, 1990 Date Analyzed: May 24-29, 1990

RESULTS.

					Ethyl	Total	Oil &
Sample	Gasoline	Diesel	Benzene	Toluene	Benzene	Xylenes	Grease
No.	(mg/Kg)	(mg/Kg)	(µg/Kg)	(µg/Kg)	<u>(µg/Kg)</u>	(ug/Kg)	(mg/Kg)
G*-*,2,3,4	4 N.D.		N.D.	N.D.	N.D.	N.D.	
G2-1, 3,4			N.D.	N.D.	N.D.	N.D.	
G3-1,2,3,4	4 N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
G4-1,2,3,4		N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
G5-1,2,3,4			N.D.	N.D.	N.D.	N.D.	
BLANK.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE							
RECOVERY	94.1%	93.5%	98.3%	101.0%	97.0%	98.9%	
y - S⊇IKi	E						
TVERY	91.4%	86.4%	91.4%	88.2%	99.6%	109.5%	
AOI1							
_IM T	2.5	5	5	5	5	5	5
N PHOD OF	5030/	3500/					503
ANALYSIS	8015	8015	8020	8020	8020	8020	D&E

( a\_ab, Inc.

Jeaville Guong

Senior Chemist

Eric Tam

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

(#238)Hazardous Waste

 Drinking Water (#955)

Waste Water

Consultation

June 6, 1990

ChromaLab File No.: 0590217

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: George Ford

FE: Five rush composited soil samples for Gasoline/BTEX and TTLC Lead analyses

Project Number: 90C0028A

Date Submitted: May 30, 1990 [ate Sampled: May 30, 1990 Date Analyzed: June 1-4, 1990 Date Extracted: June 1-4, 1990

RESULTS:

ke <u>onrin</u> :				Ethyl	Tota1	Total
Sample No	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Benzene (µg/Kg)	Xylenes (µg/Kg)	Lead (mg/Kg)
G6-1.2,3,4 G'-1.2,3,4 G8-1.2,3,4 G9-1.2,3,4 G10-1,2,3,4	N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D. N.D.	N.D.
BLANE	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKED RECOVERY	94.1%	98.3%	101.0%	97.0%	98.9%	99.1%
DUP. SPIKED RECOVERY	90.4%	96.7%	88.2%	98.5%	98.7%	102.4%
DETECTION LIMIT	2.5	5	5	5	5	0.10
METHOD OF ANALYSIS	5030/ 8015	8020	8020	8020	8020	7420

Chromatab, Inc.

Day to Duong Sentor Chemist Eric Tam

Analytical Laboratory Specializing in GC-GC/MS

June 11, 1990

Environmental Analysis

 Hazardous Waste (#238)

 Drinking Water (#955)

Waste Water

ChromaLab File No.: 0690034

Woodward-Clyde Consultants, Inc.

Attn: Bill Copeland

RE: Two composite soil samples for Gasoline/BTEX analyses

Project Number: 90C0028A

Date Extracted: N/A

Date Sampled: June 4, 1990

Date Submitted: June 4, 1990

June 9, 1990 Date Analyzed:

RESULTS:

Samp e	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (ug/Kg)	Total Xylenes (ug/Kg)
G 11-1,2,3,4 G 12-1,2,3,4	N.D. N.D.	N.D. N.D.	N.D. N.D.	N.D. N.D.	N.D. N.D.
BLANE SPIKE RECOVERY DUP. SPIKE	N.D. 94.1%	N.D. 98.3%	N.D. 101.0%	N.D. 97.0%	N.D. 98.9%
RECOVERY DETECTION LIMIT	95 <b>.2%</b> 2 <b>.</b> 5	91.4% 5.0	88.2% 5.0	99.6% 5.0	109.5% 5.0
METHOD OF ANALYSIS	5030/ 8015	8020	8020	8020	8020

CHROMA\_AB, INC.

Taviong Duong

Senior Chamist

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Analytical Laboratory Specializing in GC-GC/MS

- Environmental Analysis
- Hazardous Waste (#E694)
- Drinking Water
- (#955)
- Waste Water
- Consultation

June 15, 1990

ChromaLab File No.: 0690080-81

Woodward-Clyde Consultants, Inc.

Attn: George Ford

RE: Eight composited soil samples for Gasoline/BTEX analysis

Project Number: 90C0028A

Date Sampled: June 8, 1990 Date Submitted: June 8, 1990 Date Extracted: June 12-14, 1990 Date Analyzed: June 12-14, 1990

#### RESULTS:

				Ethyl	Total
Sample	Gasoline	Benzene	Toluene	Benzene	Xylenes
No.	(mg/Kg)	(µg/Kg)	(µg/Kg)	<u>(µg/Kg)</u>	<u>(µg/Kg)</u>
G13-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.
G14-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.
G15-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.
G16-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.
G17-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.
G18-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.
G19-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.
G20-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	94.1%	98.3%	101.0%	97.0%	98.9%
DUP. SPIKE REC		91.4%	97.6%	88.2%	109.5%
DETECTION LIMI	=	5.0	5.0	5.0	5.0
METHOD OF	5030/	- • •			
ANALYSIS	8015	8020	8020	8020	8020
FULLETOTO		<del></del> -			

ChromaLab, Inc.

David Duong

Senior Chemist

Eric Tam

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

 Hazardous Waste (#E694)

Drinking Water

(#955)

Waste Water

Consultation

June 21, 1990

ChromaLab File No.: 0690125

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: George Ford

RE: Seven composited soil samples for Gasoline/BTEX, TTLC Lead, and STLC Lead analyses

Project Number: 90C0028A

Date Sampled: June 13, 1990

Date Submitted: June 13, 1990

Date Extracted: June 14-20, 1990 Date Analyzed: June 14-20,1990

#### **RESULTS:**

KLOOL TO:				Ethyl	Total	TTLC	STLC
Sample	Gasoline (mg/Kg)	Benzene (ug/Kg)	Toluene (µg/Kg)	Benzene (µg/Kg)	Xylenes (μg/Kg)	Lead (mg/Kg)	Lead (mg/L)
	Citigat						
G21-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	3.46	N.D.
G22-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	3.77	N.D.
G23-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	11.8	N.D.
G24-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.77	N.D.
G25-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	3.51	N.D.
G26-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	3.67	N.D.
G27-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	3.08	0.27
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	94.1%	98.3%	101.0%	97.0%	98.9%	101.2%	99.4%
DUP SPIKE RECOVERY	95.2%	91.4%	97.6%	88.2%	109.5%	98.1%	101.3%
DETECTION		-	5	5	5	0.05	0.10
LIMIT	2.5	5	Ð	5	J	3050/	3010/
METHOD OF ANALYSIS	5030/ 8015	8020	8020	8020	8020	7420	7420*

<sup>\*</sup>Extracted as per Title 22 WET procedures.

ChromaLab, Inc.

David Duong

Senior Chemist

Incla Eric Tam

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

Hazardous Waste (#E694)

Drinking Water (#955)

Waste Water

Consultation

June 21, 1990

ChromaLab File No.: 0690123

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: George Ford

RE: Three composited soil samples for Gasoline/BTEX, TTLC Lead,

and STLC Lead analyses

Project Number: 90C0028A

Date Sampled: June 13, 1990 Date Submitted: June 13, 1990 Date Extracted: June 14-20, 1990 Date Analyzed: June 14-20, 1990

#### RESULTS:

		•		Ethyl	Total	TTLC	STLC
Sample	Gasoline	Benzene	Toluene	Benzene	Xylenes	Lead	Lead
No.	(mg/Kg)		(µg/Kg)		(µg/Kg)	(mg/Kg)	(mg/L)
G28-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	3.44	0.20
G29-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	4.47	N.D.
G30-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	4.24	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE							
RECOVERY	94.1%	98.3%	101.0%	97.0%	98.9%	101.2%	99.4%
DUP SPIKE							
RECOVERY	95.2%	91.4%	97.6%	88.2%	109.5%	98.1%	101.3%
DETECTION							
LIMIT	2.5	5	5	5	5	0.05	0.10
METHOD OF	5030/					3050/	3010/
ANALYSIS	8015	8020	8020	8020	8020	7420	7420*

\*Extracted as per Title 22 WET procedures.

Chromalab, Inc.

David Duong

Senior Chemist

Eric Tam

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JUH-25-90

Analytical Laboratory Specializing in GC-GC/MS

June 25, 1990

Environmental Analysis

Hazardous Waste (#E694)

• Drinking Water (#955)

Waste Water

Consultation

ChromaLab File No.: 0690162

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

RE: Four composited soil samples for Gasoline/BTEX analysis

Project Number: 90C0028A

Date Sampled: June 18, 1990 Date Extracted: June 20-22, 1990

Date Submitted: June 18, 1990 Date Analyzed: June 20-22,1990

#### RESULTS:

Sample	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)
G31-1,2,3,4 G32-1,2,3,4 G33-1,2,3,4 G34-1,2,3,4	N.D. N.D. N.D. N.D.	N.D. N.D. N.D.	N.D. N.D. N.D.	N.D. N.D. N.D.	N.D. N.D. N.D. N.D.
BLANK SPIKE RECOVERY DUP SPIKE REC DETECTION LIMI	95.2%	N.D. 98.3% 91.4% 5.0	N.D. 101.0% 97.6% 5.0	N.D. 97.0% 88.2% 5.0	N.D. 98.9% 109.5% 5.0
METHOD OF ANALYSIS	5030/ 8015	8020	8020	8020	8020

ChromaLab, Inc.

-David Duong Senior Chemist Eric Tam

Analytical Laboratory
Specializing in GC-GC/MS

• Environmental Analysis

Hazardous Waste (#E694)

Drinking Water

(#955)

Waste Water

Consultation

July 3, 1990

ChromaLab File No.:

0690225 0690226

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

RE: Eleven composited soil samples for Gasoline/BTEX, TTLC Lead

and STLC Lead analyses.

Project Number: 90C0028A

Date Sampled: June 26, 1990 Date Submitted: June 26, 1990

Date Extracted: June 26 - July 03, 1990 Date Analyzed: June 26 - July 03, 1990

#### **RESULTS:**

				Ethyl	Total	TTLC	STLC
Sample	Gasoline	Benzene	Toluene	Benzene	Xylenes	Lead	Lead
No.	(mg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(mg/Kg)	(mg/L)
G35-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.06	N.D.
G36-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.33	N.D.
G37-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.47	N.D.
G38-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.60	N.D.
G39-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	4.35	N.D.
G40-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	4.16	N.D.
G41-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.03	N.D.
G42-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	4.19	N.D.
G43-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	7.19	N.D.
G44-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.70	N.D.
G45-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.21	N.D.
BLANK SPIKE	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
RECOVERY DUP. SPIKE	94.1%	98.3%	101.0%	97.0%	98.9%	97.8%	98.1%
RECOVERY DETECTION	95.2%	91.4%	97.6%	88.2%	109.5%	98.5%	102.9%
LIMIT METHOD OF	2.5 5030/	5	5	5	5	0.05 305 <b>0</b> /	0.10 3010/
ANALYSIS	8015	8020	8020	8020	8020	7420	7420*

\*Extracted per Title 22 WET procedures

ChromaLab, Inc.

David Duong

Senior Chemist &

Tout la

Eric Tam

Analytical Laboratory
Specializing in GC-GC/MS

July 13, 1990

Environmental Analysis

Hazardous Waste (#E694)

0790021

Drinking Water

(#955)

Waste Water

Consultation

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WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

RE: Four composited soil samples for Gasoline/BTEX, TTLC Lead,

ChromaLab File No.:

and STLC Lead analyses

Project Number: 90C00 28A

Date Sampled: July 3, 1990 Date Extracted: July 5-11, 1990

Date Submitted: July 3, 1990

Date Analyzed: July 5-11,1990

#### RESULTS:

				Ethyl	Total	TTLC	STLC
Sample	Gasoline	Benzene	Toluene	Benzene	Xylenes	Lead	Lead
No.	(mg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(μg/Kg)	(mg/Kg)	(mg/Kg)
G46-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	4.67	N.D.
G47-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.62	N.D.
G48-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	4.19	N.D.
G49-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	3.85	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE							
RECOVERY	101.7%	83.2%	86.5%	103.2%	96.7%	98.6%	99.4%
DUP SPIKE							
RECOVERY	97.1%	91.6%	102.3%	111.0%	106.1%	111.7%	98.5%
DETECTION							
LIMIT	2.5	5	5	5	5	0.05	0.10
METHOD OF	5030/					3050/	3010/
ANALYSIS	8015	8020	8020	8020	8020	7420	7420*

\*Extracted per Title 22 WET procedure

ChromaLab, Inc.

David Duong

Senior Chemist

Eric Tam

July 16, 1990

Analytical Laboratory
Specializing in GC-GC/MS

Environmental Analysis

• Hazardous Waste (#E694)

Drinking Water

(#955)

Waste Water

Consultation

Consultation

exempleh File No.

ChromaLab File No.: 0790034

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

RE: Seven composited soil samples for Gasoline/BTEX, TTLC Lead and STLC Lead analyses

Project Number: 90C0028A

Date Sampled: July 6, 1990 Date Extracted: July 6-14, 1990 D

Date Submitted: July 6, 1990 Date Analyzed: July 6-14, 1990

#### **RESULTS:**

				Ethy1	Tota1	TTLC	STLC
Sample	Gasoline	Benzene	Toluene	Benzene	Xylenes	Lead	Lead
No.	(mg/Kg)		(µg/Kg)		(µg/Kg)	(mg/Kg)	(mg/Kg)
						•	
G50-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.45	0.51
G51-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.81	N.D.
G52-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	4.42	N.D.
G53-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.72	0.64
G54-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.57	0.51
G55-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	8.36	1.30
G56-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	9.87	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE REC.	97.1%	91.6%	102.3%	111.0%	106.7%	99.4%	98.5%
DUP SPIKE							
RECOVERY	101.7%	83.2%	86.5%	103.2%	93.1%	97.8%	102.9%
DET. LIMIT	2.5	5	5	5	5	0.05	0.10
METHOD OF	5030/					3050/	3010/
ANALYSIS	8015	8020	8020	8020	8020	7420	7420*

\*Extracted per TITLE 22 WET procedure

ChromaLab, Inc.

David Duong

Senior Chemist

ErreTam (by 10)

Eric Tam

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

Hazardous Waste (#E694)

Drinking Water

(#955)

Waste Water

Consultation

July 16, 1990

ChromaLab File No.: 0790033

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

RE: Five composited soil samples for Gasoline/BTEX, TTLC Lead

and STLC Lead analyses

Project Number: 90C0028A

Date Sampled: July 6, 1990 Date Extracted: July 6-14, 1990

Date Submitted: July 6, 1990 Date Analyzed: July 6-14, 1990

RESULTS:

Sample No.	Gasoline (mg/Kg)		Toluene (µg/Kg)		Total Xylenes (µg/Kg)	TTLC Lead (mg/Kg)	STLC Lead (mg/kg)
G57-1,2,3,4 G58-1,2,3,4 G59-1,2,3,4 G60-1,2,3,4 G61-1,2,3,4	N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D.	5.12 4.42 10.22 10.98 12.85	N.D. N.D. 0.78 0.40 0.63
BLANK SPIKE REC. DUP SPIKE RECOVERY DET. LIMIT	N.D. 97.1% 101.7% 2.5	N.D. 91.6% 83.2%	N.D. 102.3% 86.5%	N.D. 111.0% 103.2% 5		N.D. 99.4% 97.8% 0.05	N.D. 98.5% 102.9% 0.10
METHOD OF ANALYSIS	5030/ 8015	8020	8020	8020	8020	3050/ 7420	3010/ 7420*

<sup>\*</sup>Extracted per TITLE 22 WET procedure

Chromatab, Inc.

David Duong

Senior Chemist

Éric Tam

#### Analytical Laboratory Specializing in GC-GC/MS

· Environmental Analysis

 Hazardous Waste (#E694)

Drinking Water

(#955)

Waste Water

Consultation

September 17, 1990

ChromaLab File No.: 0990020

WOODWARD - CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

Re: Eight composited soil samples for Gasoline/BTEX, TTLC Lead, and CAM WET Lead analyses

Project Number: 90C0028A

Date Sampled: Sept. 6, 1990 Date Submitted: Sept. 6, 1990 Date Extracted: Sept. 7-13, 1990 Date Analyzed: Sept.7-13, 1990

#### RESULTS:

							CAM
				Ethyl	Total	TTLC	WET
Sample	Gasoline	Benzene	Toluene	Benzene	Xylenes	s Lead	Lead
No.	(mg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(mg/Kg)	(mg/L)
G62-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.48	0.86
G63-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	7.06	0.72
G64-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	10.3	1.56
G65-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	7.40	0.42
G66-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.19	1.88
G67-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.16	0.68
G68-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.47	0.57
G69-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.79	0.29
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE							
RECOVERY	98.7%	86.1%	92.5%	94.4%	93.5%	96.8%	101.5%
DUP SPIKE							
RECOVERY	91.9%	89.3%	89.7%	90.0%	107.6%	94.1%	99.3%
DETECTION							
LIMIT	2.5	5	5	5	5	0.05	0.10
METHOD OF	5030/					3050/	1310/
ANALYSIS	8015	8020	8020	8020	8020	7420	7420*

\*Extracted per title 22 WET procedure.

David Duong

Senior Chemist

auch Eric Tam

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

 Hazardous Waste (#E694)

 Drinking Water (#955)

Waste Water

Consultation

September 14, 1990

ChromaLab File No.: 0990029

WOODWARD - CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

Re: Three composited soil samples for Gasoline/BTEX, TTLC

Lead, and CAM WET Lead analyses

Project Number: 90C0028A

Date Sampled: Sept. 7, 1990 Date Submitted: Sept. 7, 1990

Date Extracted: Sept. 10-14, 1990 Date Analyzed: Sept. 10-14, 1990

#### RESULTS:

Sample No.	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (ug/Kg)	Ethyl Benzene (µg/Kg)	Tota¹ Xylenes (µg/Kg)		CAM WET Lead (mg/L)
G7 -1,2,3,4 G -1,2,3,4 G -1,2,3,4	N.D. N.D. N.D.	N.D. N.D. N.D.	N.D. N.D. N.D.	N.D. N.D. N.D.	N.D. N.D. N.D.	5.99 5.23 4	0.46 0.31 1.34
BLANK SELKE	N D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
RECOVERY DUP SPIKE	96.4%	86.1%	92.5%	94.4%	93.5%	94.3%	1.5%
RECOVERY DETECTION	91.1%	89.3%	89.7%	90.0%	107.6%	98.5%	99.7%
LIMIT METHOD OF	2.5 5030/	5	5	5	5	0.05 3050/	0.10 1310/
ANALYSIS	8015	8020	802ა	8020	8020	7420	7420*

\*Extracted per title 22 WET procedure.

CHROMALAB, INC.

David Duong

Senior Chemist

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/ Director

Analytical Laboratory Specializing in GC-GC/MS

September 20, 1990

· Environmental Analysis

• Hazardous Waste (#E694)

Drinking Water

(#955)

Waste Water

Consultation

ChromaLab File No.:

0990060 0990061

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

RE: Eleven composite samples for Gasoline/BTEX TTLC Lead, and

STLC Lead analyses

Project Number: 90C0028A

Date Sampled: Sept. 13, 1990 Date Submitted: Sept. 13-20, 1990

Date Extracted: Sept.14-20,1990 Date Analyzed: Sept.14-20,1990

#### **RESULTS:**

				Ethyl	Total	TTLC	STLC
Sample	Gasoline	Benzene	Toluene	Benzene	Xylenes	Lead	Lead
No.	(mg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(mg/Kg)	(mg/L)
73-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.01	1.02
74-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	2.01	1.17
75-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	3.88	0.88
76-1,2	N.D.	N.D.	N.D.	N.D.	N.D.	6.71	1.00
77-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.94	0.77
78-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	7.01	0.64
79-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	8.83	0.89
80-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.38	0.77
81-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.27	1.23
82-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	8.00	0.90
83-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.86	N.D.
BLANK SPIKE	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
RECOVERY DUP SPIKE	91.1%	86.1%	92.5%	90.0%	107.6%	101.9%	99.2%
RECOVERY DETECTION	98.7%	89.3%	89.7%	94.4%	93.5%	98.7%	101.5%
LIMIT	2.5	5	5	5	5	0.05	0.10
METHOD OF	5030/					3050/	3010/
ANALYSIS	8015	8020	8020	8020	8020	7420	74:20*

<sup>\*</sup>Extracted per title 22 WET procedure.

CHROMALAB, INC.

Eric Tam

Laboratory Director

David Duong

Senior Chemist

#### Analytical Laboratory Specializing in GC-GC/MS

Environmental Analysis

 Hazardous Waste (#E694)

(#955)

Drinking Water

Waste Water

Consultation

September 28, 1990

ChromaLab File No.:

0990104 0990105

WOODWARD - CLYDE CONSULTANTS, INC.

0990106

Attn: Bill Copeland

Re: Twenty-one composited soil samples for Gasoline/BTEX, TTLC

Lead, and CAM WET Lead analyses

Project Number: 90C0028A

Date Sampled: Sept. 20, 1990 Date Submitted: Sept. 21, 1990

Date Analyzed: Sept. 21-28, 1990

#### RESULTS:

1120001	<u></u>						
				Ethyl	Total	TTLC	WET
Sample	Gasoline	Benzene	Toluene	Benzene	Xylenes	Lead	Lead
No	(mg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(ug/Kg)		(mg/L)
G84-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.22	N.D.
G85-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	13.2	N.D.
G86-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.72	N.D.
G87-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.19	N.D.
G88-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	.10.6	N.D.
G89-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	10.4	N.D.
G90-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	9.16	N.D.
G91-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	7.50	N.D.
G92-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	10.3	N.D.
G93-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.19	N.D.
G94-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.45	N.D.
G95-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.55	N.D.
G96-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	4.46	N.D.
G97-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.95	N.D.
G98-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.54	N.D.
G99-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.95	N.D.
G100-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	3.19	N.D.
G101-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.48	N.D.
G102-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	8.05	N.D.
G103-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.38	N.D.
G104-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.10	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE							
RECOVERY	91.1%	89.3%	89.7%	90.0%	107.5%	96.4%	99.3%
DUPLICATED							
SPIKE							
RECOVERY	96.4%	86.1%	92.5%	94.4%	93.5%	96.5%	91.1%
DETECTION					_		
LIMIT	2.5	5	5	5	5	0.05	0.10
METHOD OF	5030/					3050/	3010/*
ANALYSIS	8015	8020	8020	8020	8020	7420	7420

\* EXTRACTED PER TITLE 22 WET PROCEDURE.

CHROMALAB, INC

David Duong

Senior Chemist

THO C

Eric Tam

**Analytical Laboratory** Specializing in GC-GC/MS Environmental Analysis

 Hazardous Waste (#E694)

Drinking Water

(#955)

Waste Water

Consultation

October 5, 1990 ChromaLab File No.:

0990154

0990155

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

Ten composited soil samples for Gasoline/BTEX, TTLC Lead, RE:

and CAM WET Lead analyses

Project Number: 90C0028A

Date Sampled: Sept. 27, 1990 Date Extracted: Oct. 1-4, 1990 Date Analyzed: Oct. 1-4, 1990

Date Submitted: Sept. 28, 1990

**RESULTS:** 

Sample No.	Gasoline (mg/Kg			Ethyl Benzene (µg/Kg)	•	TTLC Lead (mg/Kg)	CAM WET Lead (mg/L)
G105-1,2,3,4 G105-5,6,7,8 G105-9,10,11,12 G105-13,14,15,16 G105-17,18,19,20 G105-21,22,23,24 G105-25,26,27,28 G105-29,30,31,32 G105-33,34,35,36 G105-37,38,39,40	N.D. N.D. N.D. N.D. N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D. N.D. N.D. N.D.	N.D. N.D. N.D.D. N.D.D. N.D.D. N.D.D. N.D.	N.D. N.D. N.D. N.D. N.D. N.D. N.D.	9.15 6.08 6.98 7.96 6.99 10.9 6.61 7.36 7.97	N. D. D. D. D. D. D. D. D. D. D. D. D. D.
BLANK SPIKED RECOVERY DUP SPIKED REC DETECTION LIMIT METHOD OF ANALYSIS	N.D. 91.7% 96.4% 2.5 5030/ 8015	N.D. 98.6% 86.1% 5	N.D. 99.1% 92.5% 5	N.D. 103.59 94.4% 5	N.D. 105.6% 93.5% 5	N.D. 98.5% 103.69 0.05 3050/ 7420	N.C. 96.5% 96.4% 0.10 3010/ 7420*

\*Extracted per title 22 WET procedure

CHROMALAB, INC.

David Duong Senior Chemist Éric Tam

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

 Hazardous Waste (#E694)

Drinking Water

(#955)

Waste Water

Consultation

October 8, 1990

ChromaLab File No.: 0990168

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

Ten composited soil samples for Gasoline/BTEX, total Lead, RE:

and CAM WET Lead analyses

Project Number: 90C0028A/AER C

Date Sampled: Sept. 28, 1990 Date Extracted: Oct. 1-8, 1990

Date Submitted: Oct. 1, 1990 Date Analyzed: Oct. 1-8, 1990

#### RESULTS:

				Ethy1	Total	Total	CAM WET
Sample	Gasoline	Benzene	Toluene	Benzene	Xy l'enes	Lead	Lead
No.	(mg/Kg)	(µg/Kg)	(µg/Kg)	<u>(μg/Kg)</u>	(µg/Kg)	(mg/Kg)	(mg/L)
G106-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	8.45	N.D.
G107-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	9.52	И.Э.
G108-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	7.46	и.Э.
G109-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	9.75	N.D.
G110-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.92	N.D.
G111-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	8.41	N.J.
G112-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	8.12	N.D.
G113-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	8.20	N.D.
G114-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	8.05	N.D.
G115-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.86	N.D.
					N D	AL D	N. D
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKED	04 70	00.69	00 10	103.5%	105.6%	105.3%	98.1%
RECOVERY	91.7%	98.6%	99.1%	103.5%	105.0%	100.3%	30.1%
DUP SPIKED	01 10	89.3%	89.7%	90.0%	107.6%	96.4%	97.9%
RECOVERY	91.1%	Φ9.3%	09.1%	30.0%	107.0%	30.4%	31.3%
DETECTION	2.5	5	5	5	5	0.05	0.10
LIMIT METHOD OF	5030/	3550/	5	5	J	3050/	3010/
	8015	8015	8020	8020	8020	7420	7420*
ANALYSIS	0015	6015	0020	0020	0020	1-120	1720"

\*Extracted per title 22 WET procedure.

CHROMALAB, INC.

David Duong

Senior Chemist

Enzlam (4,00)

Eric Tam

#### Analytical Laboratory Specializing in GC-GC/MS

Environmental Analysis

 Hazardous Waste (#E694)

Drinking Water

(#955)

 Waste Water Consultation

October 15, 1990

ChromaLab File No.: 1090035

1090036

WOODWARD-CLYDE CONSULTANTS, INC.

Attn:

Bill Copeland

RE: Twelve composited soil samples for Gasoline/BTEX, Total

Lead, and CAM WET Lead analysses

Project Number: 90C0028A

Date Sampled: Oct. 4, 1990

Date Submitted: Oct. 5, 1990

Date Extracted: Oct. 6-13, 1990 Date Analyzed: Oct.6-13, 1990

**RESULTS:** 

Sample	Gasoline	Benzene	Toluene	Ethyl Benzene	Total	Total	CAM WET
No.	(mg/Kg)	(µg/Kg)	(µg/Kg)		Xylenes	Lead	Lead
			(Ba) (A)	<u>(µg/Kg)</u>	(µg/Kg)	(mg/Kg)	(mg/L)
G126-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.18	N.J.
G127-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.16	N.J.
G128-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.21	N.D.
G129-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	6.18	N.D.
G130-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	10.3	N.D.
G131-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	9.11	N.D.
G132-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	9.60	N.D.
G133-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	41.0	0.36
G134~1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	13.2	N.D.
G135-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	13.3	N.D.
G136-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	12.2	N.D.
G137-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	10.2	N.D.
BLANK SPIKED	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
RECOVERY DUP SPIKED	91.7%	98.6%	99.1%	103.5%	105.6%	94.5%	100.0%
RECOVERY DETECTION	91.1%	89.3%	89.7%	90.0%	107.6%	106.3%	105.3%
LIMIT METHOD OF	2.5 5030/	5	5	5	5	0.05 3050/	0.10 3010/
ANALYSIS	8015	8020	8020	8020	8020	7420	7420*

<sup>\*</sup>Extracted per title 22 WET procedure.

CHROMALAB, INC.

David Duong

Senior Chemist

Eric Tam

Analytical Laboratory Specializing in GC-GC/MS

October 15, 1990

Environmental Analysis

 Hazardous Waste (#E694)

Drinking Water

(#955)

Waste Water

Consultation

ChromaLab File No.: 1090037

WOODWARD-CLYDE CONSULTANTS, INC.

Attn:

Bill Copeland

RE: Six composited soil samples for Gasoline/BTEX, Total

Lead, and CAM WET Lead analysses

Project Number:

90C0028A

Date Sampled: Oct. 5, 1990

Date Submitted: Oct. 5, 1990

Date Extracted: Oct. 6-13, 1990 Date Analyzed: Oct.6-13, 1990

#### **RESULTS:**

Sample No.	Gasoline Benzene Toluene (mg/Kg) (μg/Kg) (μg/Kg)		Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)	Total Lead (mg/Kg)	CAM WET Lead	
1101		<u> </u>	(EN (EN (EN (EN )		(49/19)	(mg/ kg)	(mg/L)
G138-1,2,3,4 G139-1,2,3,4	N.D. N.D.	N.D. N.D.	N.D. N.D.	N.D. N.D.	N.D. N.D.	7.31 13.3	N.D. N.D.
G140-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	14.4	N.D.
G141-1,2,3,4 G142-1,2,3,4	N.D.	N.D.	N.D. N.D.	N.D. N.D.	N.D. N.D.	8.36 11.6	N.D. N.D.
G143-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	13.6	N.D.
BLANK SPIKED	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
RECOVERY DUP SPIKED	91.7%	98.6%	99.1%	103.5%	105.6%	94.5%	100.0%
RECOVERY DETECTION	91.1%	89.3%	89.7%	90.0%	107.6%	106.3%	105.3%
LIMIT METHOD OF	2.5 5030/	5	5	5	5	0.05 3050/	0.10 3010/
ANALYSIS	8015	8020	8020	8020	8020	7420	7420*

\*Extracted per title 22 WET procedure.

CHROMALAB, INC.

David Duong

Senior Chemist

Eric Tam

#### Analytical Laboratory Specializing in GC-GC/MS

October 22, 1990

• Environmental Analysis

 Hazardous Waste (#E694)

Drinking Water

(#955)

Waste Water

• Consultation ChromaLab File No.:

1090099

WOODWARD-CLYDE CONSULTANTS, INC.

Attn:

Bill Copeland

Eighteen composited soil samples for Gasoline/BTEX, Total Lead and CAM WET Lead analyses

Project Number: 90C0028A

Date Sampled: Oct. 10, 1990 Date Submitted: Oct. 15, 1990

Date Extracted: Oct. 16-19, 1990 Date Analyzed: Oct. 16-19,1990

#### RESULTS:

				Ethyl	Total	Total	CAM WET
Sample	Gasoline	Benzene	Toluene	Benzene	Xylenes	Lead	Lead
No.	(mg/kg)	(µg/Kg)	(µg/Kg)	<u>(µg/Kg)</u>		(mg/Kg)	(mg/L)
G144-1,2,3,4		N.D.	N.D.	N.D.	N.D.	11.4	1.26
G145-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	14.3	1.23
G146-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	13.4	1.35
G147-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	12.1	
G148-1,2,3,4		N.D.	N.D.	N.D.	N.D.	12.0	1.13
G149-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	9.70	1.06
G150-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	9.63	0.94
G151-1,2,3,4		N.D.	N.D.	N.D.	N.D.	11.7	0.84
G152-1,2,3,4		N.D.	N.D.	N.D.	N.D.	11.3	0.66
G153~1,2,3,4		N.D.	N.D.	N.D.	N.D.	10.6	0.32
G154-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	15.6	0.44
G155-1,2,3,4		N.D.	N.D.	N.D.	N.D.	13.4	0.67
G156-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	33.6	1.22
G157-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.		1.00
G158-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	10.6	0.86
G159-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	10.8	1.31
G160-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	8.70	1.18
G161-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	9.25	0.66
BLANK SPIKED	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
RECOVERY DUP SPIKED	91.7%	98.6%	99.1%	103.5%	105.6%	99.2%	98.6%
RECOVERY DETECTION	91.1%	89.3%	89.7%	90.0%	107.6%	100.7%	104.1%
LIMIT METHOD OF	2.5 5030/	5	5	5	5	0.05 3050/	0.10 3010/
ANALYSIS	8015	8020	8020	8020	8020	7420	7420*

\*Extracted per title 22 WET procedure.

CHROMALAB, INC.

Senior Chemist

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

 Hazardous Waste (#E694)

Drinking Water

(#955)

Waste Water

Consultation

October 22, 1990

Chromatab File No.: 1090099

WOODWARD-CLYDE CONSULTANTS, INC.

Attn:

Bill Copeland

Three composited soil samples for Gasoline/BTEX, Total

Lead and CAM WET Lead analyses

Project Number: 90C0028A

Date Sampled: Oct. 10, 1990

Date Submitted: Oct. 15, 1990

Date Extracted: Oct. 16-19, 1990 Date Analyzed: Oct. 16-19,1990

RESULTS:

				Ethyl	Total	Total	CAM WET
Sample	Gasoline	Benzene	Toluene	Benzene	Xylenes	Lead	Lead
No.	(mg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	<u>(µg/Kg)</u>	(mg/Kg)	(mg/L)
G162-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	3.95	N.D.
G163-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	4.69	0.44
G164-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	12.2	N.D.
	_	=		5		N 5	N. D
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKED	_				405 000	20 00	0.0 0.04
RECOVERY	91.7%	98.6%	99.1%	103.5%	105.6%	99.2%	98.6%
DUP SPIKED							404 404
RECOVERY	91.1%	89.3%	89.7%	90.0%	107.6%	100.7%	104.1%
DETECTION							
LIMIT	2.5	5	5	5	5	0.05	0.10
METHOD OF	5030/					3050/	3010/
ANALYSIS	8015	8020	8020	8020	8020	7420	7420*

\*Extracted per title 22 WET procedure.

CHROMALAB, INC.

Senior Chemist

EricTam (by 10)

#### **Analytical Laboratory** Specializing in GC-GC/MS

Environmental Analysis

 Hazardous Waste (#E694)

Drinking Water

(#955)

Waste Water

Consultation

October 25, 1990

Chromatab File No.: 1090132

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

RE: Nine composited soil samples for Gasoline/BTEX, total Lead, and

CAM WET Lead analyses

Project Number: 90C0028A

Date Sampled: Oct. 17, 1990

Date Submitted: Oct. 18, 1990 Date Extracted: Oct. 19-25,1990 Date Analyzed: Oct. 19-25,1990

#### RESULTS:

Sample No.	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)	Total Lead (mg/Kg)	CAM WET Lead (mg/L)
G165-1,2,3,4 G166-1,2,3,4 G167-1,2,3,4 G168-1,2,3,4 G169-1,2,3,4 G170-1,2,3,4 G171-1,2,3,4 G172-1,2,3,4 G173-1,2,3,4	N.D. N.D. N.D. N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D. N.D. N.D. N.D.	22.9 19.3 14.8 14.5 14.6 10.5 15.1 27.9 15.9	0.12 0.18 0.12 0.11 0.10 0.27 0.12 0.14
BLANK SPIKED	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
RECOVERY DUP SPIKED RECOVERY	91.7%	98.6% 89.3%	99.1% 89.7%	103.5%	105.6%	99.1%	89.7% 95.2%
DETECTION LIMIT METHOD OF ANALYSIS	2.5 5030/ 8015	5 8020	5 8020	5 8020	5 8020	0.05 3050/ 7420	0.10 3010/ 7420*

<sup>\*</sup>Extracted per title 22 WET procedure.

CHROMALAB, INC.

Senior Chemist

Eric Tam

#### **Analytical Laboratory** Specializing in GC-GC/MS

Environmental Analysis

 Hazardous Waste (#E694)

Drinking Water

(#955)

Waste Water

Consultation

October 29, 1990

ChromaLab File No.:

1050150 1090151

WOODWARD-CLYDE CONSULTANTS, INC.

Attn:

Bill Copeland

RE: Eleven composited soil samples for Gasoline/BTEX, total

Lead, and CAM WET Lead analyses

Project Number:

90C0028A

Date Sampled: Oct. 19, 1990

Date Submitted: Oct. 22, 1990

Date Extracted: Oct. 23-29,1990 Date Analyzed: Oct. 23-29,1990

**RESULTS:** 

				Ethyl	Total	Total	CAM WET
Sample	Gasoline	Benzene	Toluene	Benzene	Xylenes	Lead	Lead
No.	(mg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(mg/Kg)	(mg/L)
G174-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	15.0	0.39
G175-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	14.6	0.39
G176-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	8.57	0.19
G177-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.04	0.16
G178-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	4.63	0.19
G179-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	4.47	0.16
G180-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	4.39	013
G181-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	4.77	016
G182-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	7.14	019
G183-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	5.04	0.13
G184-1,2,3,4	N.D.	N.D.	N.D.	N.D.	N.D.	8.96	0.30
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	7 93.8%	105.5%	98.6%	91.0%	93.0%	99.1%	105.7%
DUP SPIKE REC	96.4%	86.1%	91.5%	94.4%	93.5%	102.4%	96.6%
DET. LIMIT	2.5	5	5	5	5	0.05	0.10
METHOD OF	5030/					3050/	3010/
ANALYSIS	8015	8020	8020	8020	8020	7420	7420*

\*Extracted per title 22 WET procedure.

CHROMALAB, INC.

David Duong

Senior Chemist

Eric Tam

	Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600					3	Chain of Custody Record										
		90C Signature	00284						-	ANA ZGZ	LYSES				-	liners	REMARKS
DATE	TIME	Llm (	gheland MPLE NUMBE	Sample Matrix	S)oit, (W)ater, (A)i	EPA Method	EPA Method	EPA Method	EPA Method	PH/98/1						Number of Containers	(Sample preservation, handling procedures, etc.)
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		<i>G</i> <sup>9</sup>	-/ -2 -3 -4	:													results to R Copeland
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Woodward-Clyde Consultants
500 12th Street, Suite 100, Oakland, CA 94607-4041
(415) 893-3600

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### **Woodward-Clyde Consultants Chain of Custody Record** 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600 ANALYSES PROJECT NO. Number of Containers **REMARKS** SAMPLERS: (Signature Sample Matrix (S)oil, (W)ater, (A)ir (Sample preservation, handling EPA Method EPA Method procedures, etc.) SAMPLE NUMBER DATE TIME Results to G. Fordor B. (opelard TOTAL NUMBER OF CONTAINERS RECEIVED BY: RELINQUISHED BY: DATE/TIME DATE/TIME RECEIVED BY: RELINQUISHED BY: (Signature) (Signature) (Signature) (Signature) RECEIVED FOR LAB BY : (Signature) DATE/I'IME SHIPPED BY: COURIER: METHOD OF SHIPMENT : (Signature) (Signature)

#### **Woodward-Clyde Consultants Chain of Custody Record** 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600 PROJECT NO. 900 00 28A **ANALYSES** REMARKS SAMPLERS: (Signatigre) (Sample preservation handling EPA Method EPA Method EPA Method procedures, etc.) SAMPLE NUMBER DATE TIME Composite Seach set of 4 5 day results to g. Ford or B. Capeland TOTAL NUMBER OF CONTAINERS RECEIVED BY: 6-8-90 RELINQUISHED BY: RELINQUISHED BY: DATE/TIME DATE/TIME RECEIVED BY: .3;30 M (Stgnature) (Signature) (Signature) METHOD OF SHIPMENT: SHIPPED BY: COURIER: RECEIVED FOR LAB BY: DATE/TiME (Signature) (Signature) (Signature)

## **Woodward-Clyde Consultants**

500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600

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## Woodward-Clyde Consultants

500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600

## **Chain of Custody Record**

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### **Woodward-Clyde Consultants Chain of Custody Record** 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600 PROJECT NO. **ANALYSES** SAMPLERS: (Signature) REMARKS Sample Matrix (S)oil, (W)ater, (A)ir (Sample preservation. EPA Method EPA Method handling procedures, etc.) SAMPLE NUMBER DATE TIME Composite each set 9.4 TOTAL NUMBER OF CONTAINERS RELINQUISHED BY: DATE/TIME RECEIVED BY: **RELINQUISHED BY:** DATE/TIME RECEIVED BY: (Signature) (Signature) (Signature) (Signature) METHOD OF SHIPMENT : SHIPPED BY: COURIER: (Signature) (Signature)

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# Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600

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# Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600

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## Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041

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## Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041

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# Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600

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### Woodward-Clyde Consultants **Chain of Custody Record** 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600 **ANALYSES** PROJECT NO. 90000284 SAMPLERS: (Signature) Sample Matrix (S)oil, (W)ater, (A)ir CHROMALAB FILE # 990105 EPA Method SAMPLE NUMBER DATE TIME Composite each set Results to B. Copeland 874-3192 TOTAL NUMBER OF CONTAINERS RELINQUISHED BY: RECEIVED BY: RELINQUISHED BY: DATE/TIME RECEIVED BY: (Signature) (Signature) (Signature) (Signature) RECEIVED FOR LAB BY : COURIER: DATE/TIME METHOD OF SHIPMENT: SHIPPED BY: (Signature) (Signature) 10:30

### **Woodward-Clyde Consultants**

500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600

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### **Woodward-Clyde Consultants Chain of Custody Record** 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600 PROJECT NO. GO CO 028 A **ANALYSES** SAMPLERS; (Signature) Sample Matrix (S)oil, (W)ater, (A)ir CHROMALAB FILE # 990106 **EPA Method** SAMPLE NUMBER DATE TIME 9/20 Composite cach set Normal Results to B. Copeland 874.3192 NUMBER OF CONTAINERS RELINQUISHED BY : RELINQUISHED BY: DATE/TIME RECEIVED BY: DATE/TIME RECEIVED BY: (Signature) (Signature) (Signature) RECEIVED FOR LAB BY : METHOD OF SHIPMENT : SHIPPED BY: COURIER: DATE/TIME (Signature) (Signature) 10.30

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#### **Woodward-Clyde Consultants** Chain CHROMALAB FILE # 990168 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600 PROJECT NO. **ANALYSES** AERC 906 0028 A Number of Containers SAMPLERIS: (Signature) REMARKS Sample Matrix (S)oil, (W)ater, (A)ir (Sample preservation, EPA Method EPA Method EPA Method handling procedures, etc.) SAMPLE NUMBER DATE TIME S 8:15 9-28 G106-Will FAX lab test instructions 8:40 XX 6107-1 9:05 XX ComPOSITE 9:30 XIX G109-1 10.00 G110-1 XIX 6111-1 10:20 -) 1240 G112-1 -3 -4 TOTAL NUMBER OF CONTAINERS RELINQUISHED BY: DATE/TIME RECEIVED BY: 2:15 RELINQUISHED BY: RECEIVED BY: DATE/TIME (Signature) (Signature) (Signature) (Signature) 1 28 METHOD OF SHIPMENT : SHIPPED BY: COURIER: RECEIVED FOR LAB BY: DATE/TIME (Signature) (Signature) (Signature) 9-28 5:30 T. Vonovan

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CHROMALAB.

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	Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600						3	Chain of Custody Record								d		
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### **Woodward-Clyde Consultants Chain of Custody Record** 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600 PROJECT NO. 900028A Number of Containers REMARKS SAMPLERS: (Signature) -Sample Matrix (S)oil, (W)ater, (A)ir (Sample preservation, handling EPA Method EPA Method procedures, etc.) SAMPLE NUMBER DATE TIME 10/22 12:30 G178-1 (lowrostte FOUR VISCRETES OF EACH SAWPLE G 180-1 Noemac TAT G 182 RESULTS to BILL CORELAND 874-3192 G1836184-1

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Analytical Laboratory
Specializing in GC-GC/MS

Environmental Analysis

• Hazardous Waste (#238)

Drinking Water (#955)

Waste Water

Consultation

April 20, 1990

ChromaLab File No.:

0490053

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: George Ford

RE: Eight soil samples for Gasoline/BTEX and Oil & Grease analyses

Project Number: 90C0028A

Duration of Analysis: April 16-20, 1990

#### RESULTS:

				Ethy1	Total	Oil &
Sample	Gasoline	Benzene	Toluene	Benzene	Xylenes	Grease
No.	(mg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(µg/Kg)	(mg/Kg)
FL-1	N.D.	N.D.	N.D.	N.D.	N.D.	65
FL-2	N.D.	N.D.	N.D.	N.D.	N.D.	. 52
FL-3	N.D.	N.D.	N.D.	N.D.	N.D.	66
FL-4	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
FL-5	N.D.	N.D.	N.D.	N.D.	N.D.	55
FL-6	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
FL-7	N.D.	N.D.	N.D.	N.D.	N.D.	56
FL-8	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
BLANK SPIKE	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
RECOVERY DETECTION	102.5%	92.8%	98.3%	99.6%	95.2%	
LIMIT METHOD OF	2.5 MOD	- 5	5	5	5	50 503
ANALYSIS	8015	8020	8020	8020	8020	D&E

ChromaLab, Inc.

David Duong

Senior Chemist

Eric Tam

Laboratory Director

Client Acct: 636 Client Name: Chromalab NET Log No: 1589

Ref:

Vanadium Zinc

Date: 04-26-90

Page: 5

Descriptor, Lab No. and Results

		FL-6 04-16-90 1230						
Parameter	Limit	50921	Units					
17 CAM Metals, Total								
Antimony Arsenic Barium Beryllium Cadmium Chromium (VI) Chromium Cobalt Copper Lead Mercury Molybdenum Nickel Selenium Silver Thallium Vanadium	20.5 5.5 5.5 5.5 5.5 5.0 5.0 5.0 5.0 5.0	ND 7.9 51 ND ND NA 30 ND 12 46 0.08 ND 19 ND ND ND ND ND	mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg mg/kg					

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9:42 415-831-8798 APR-30-90 MON

Client Acct: 636 Client Name: Chromalab NET Log No: 1589

Ref:

Date: 04-26-90

Page: 3

#### Descriptor, Lab No. and Results

	_				
		FL-1 04-16-90 1230	FL-4 04-16-90 1230		
Parameter	Reporting Limit	50919	50920	Units	
17 CAM Metals, Total					
Antimony Arsenic Barium Beryllium Cadmium Chromium (VI) Chromium Cobalt Copper Lead Mercury Molybdenum Nickel Selenium Silver Thallium Vanadium Zinc	20 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	ND 11 88 ND ND NA 36 10 20 96 0.11 ND 22 ND ND ND ND ND	ND 8.1 57 ND ND NA 32 11 14 77 0.40 ND ND ND ND ND ND ND ND ND ND	mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg mg/Kg	

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

• Hazardous Waste (#238)

Drinking Water (#955)

Waste Water

Consultation

April 25, 1990

WOODWARD CLYDE CONSULTANTS, INC.

RE: 8080 analysis

Sample No.: FL-1

ChromaLab File No.: 0490053A-D

Attn: George Ford

Project No.: 90C0028A

Analysis Duration: 4/16-18/90

#### CHLORINATED PESTICIDE ANALYSIS

Compounds	Concentration (µg/Kg)	Detection Limit (µg/Kg)	Spike <u>Recovery</u>
ALDRIN	N.D.	10	103.9%
DIELDRIN	N.D.	10	
ENDRIN ALDEHYDE	N.D.	50	
ENDRIN	N.D.	10	
HEPTACHLOR	N.D.	10	
HEPTACHLOR EPOXIDE	N.D.	10	
p,p' - DDT	N.D.	50	
p,p' - DDE	N.D.	10	
p,p' - DDD	N.D.	50	101.8%
ENDOSULFAN I	N.D.	50	
ENDOSULFAN II	N.D.	50	
	N.D.	10	
	N.D.	10	
	N.D.	10	100.7%
F - BHC	N.D.	10	
ENDOSULFAN SULFATE	N.D.	100	
p,p' - METHOXYCHLOR	N.D.	100	
TOXAPHENE	N.D.	100	
PCB's	N.D.	100	
CHLORDANE	N.D.	100	

CHROMALAB, INC.

David Duong

Senior Chemist

Eric Tam

Laboratory Director

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

 Hazardous Waste (#238)

Drinking Water

(#955)

Waste Water

Consultation

Page 2

0490053 A-D ChromaLab File #

Project No: 90C0028A
Sample I.D.: FL-1,2,3,4 (composite)

Matrix: soil Method of Analysis: EPA 8270

Sample	MDL mg/Kg	Spike Recovery
		TCCOVCI 7
		99.2%
		JJ. 2-0
		93.0%
N.D.		
N.D.		
N.D.		
N.D.	0.5	
N.D.	1.0	
N.D.	0.5	
N.D.	0.5	
N.D.	0.5	105.4%
N.D.	0.5	- <b></b> -
N.D.	0.5	
N.D.	0.5	
N.D.	0.5	
N.D.		
N.D.	0.5	
	mg/Kq N.D. N.D. N.D. N.D. N.D. N.D. N.D. N.D	Sample mg/Kg       MDL mg/Kg         N.D.       0.5

ChromaLab, Inc.

David Duong

Senior Chemist

Eric Tam

Lab Director

Analytical Laboratory Specializing in GC-GC/MS

April 19, 1990

Environmental Analysis

(#238)Hazardous Waste

 Drinking Water (#955)

Waste Water

• Consultation
ChromaLab File # 0490053 A-D

Attn: George Ford Client: Woodward-Clyde Consult.

Date Submitted: Apr. 13, 1990 Date of Analysis: Apr. 19, 1990

Project No: 90C0028A
Sample I.D.: FL-1,2,3,4 (composite)

Matrix: soil Method of Analysis: EPA 8270

Meenod of mary	<del></del>		
	Sample	MDL	Spike
COMPOUND NAME	mq/Kg	mg/Kg	Recovery
PHENOL.	N.D.	0.5	
BIS(2-CHLOROETHYL) ETHER	N.D.	0.5	111.1%
2-CHLOROPHENOL	N.D.	0.5	
1,3-DICHLOROBENZENE	N.D.	0.5	
1,4-DICHLOROBENZENE	N.D.	0.5	
BENZYL ALCOHOL	N.D.	1.0	
1,2-DICHLOROBENZENE	N.D.	0.5	
2-METHYLPHENOL	N.D.	0.5	
BIS(2-CHLOROISOPROPYL)ETHER	N.D.	0.5	
4-METHYLPHENOL	N.D.	0.5	
N-NITROSO-DI-N-PROPYLAMINE	N.D.	0.5	
HEXACHLOROETHANE	N.D.	0.5	
NITROBENZENE	N.D.	0.5	
ISOPHORONE	N.D.	0.5	
2-NITROPHENOL	N.D.	0.5	
2,4-DIMETHYLPHENOL	N.D.	0.5	
BENZOIC ACID	N.D.	2.5	
BIS(2-CHLOROETHOXY)METHANE	N.D.	0.5	99.7%
2,4-DICHLOROPHENOL	N.D.	0.5	
1,2,4-TRICHLOROBENZENE	N.D.	0.5	
NAPHTHALENE	N.D.	0.5	
4-CHLOROANILINE	N.D.	1.0	
HEXACHLOROBUTADIENE	N.D.	0.5	
4-CHLORO-3-METHYLPHENOL	N.D.	1.0	
2-METHYLNAPHTHALENE	N.D.	0.5	
HEXACHLOROCYCLOPENTADIENE	N.D.	0.5	
2,4,6-TRICHLOROPHENOL	N.D.	0.5	
2,4,5-TRICHLOROPHENOL	N.D.	0.5	
2-CHLORONAPHTHALENE	N.D.	0.5	
2-CHEORONAPHINADENE 2-NITROANILINE	N.D.	2.5	
DIMETHYL PHTHALATE	N.D.	0.5	
ACENAPHTHYLENE	N.D.	0.5	
	N.D.	2.5	
3-NITROANILINE	N.D.	0.5	100.9%
ACENAPHTHENE	N.D.	2.5	
2,4-DINITROPHENOL	N.D.	2.5	
4-NITROPHENOL	N.D.	0.5	
DIBENZOFURAN	17.2.		
(continued on next page)			

Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600						Chain of Custody Record										
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Analytical Laboratory Specializing in GC-GC/MS . Environmental Analysis

 Hazardous Waste (#238)

(#955)Drinking Water

Waste Water

Consultation

May 14, 1990

ChromaLab File No.: 0590040

Page 1 of 2

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: George Ford

Thirty soil samples for Gasoline/BTEX, Oil & Grease, Total RE:

Lead, and Wet Lead analyses

Project Number: 90C0028A

Date Submitted: May 4, 1990 Date Sampled: May 4, 1990

Duration of Analysis: May 4-12, 1990

RESULTS:

				Ethyl	Total	Oil &	TTLC	STLC
ample	Gasoline	Benzene	Toluene	Benzene	Xylenes	Grease	Lead	Lead
No.	(mg/Kg)	(ug/Kg)	(ug/Kg)	(µg/Kg)	(µg/Kg)	(mg/Kg)	(mg/Kg)	(mg/L)
DT 12	N.D.	19	15	N.D.	8.1			
DT 13	7.1	34	150	170	800			
DT 14	390	150	450	830	3100		<del></del>	
DT 15	55	N.D.	N.D.	7.2	39		~ <del>~ ~</del> ~	
DT 16	1000	800	3200	4100	12000		<del>-</del>	
DT 17	27	N.D.	N.D.	7.3	120			
FL 9						N.D.	55	0.7
FL 10						N.D.	74	0.6
FL 11						N.D.	37	0.2
FL 12						N.D.	78	0.5
FL 13						N.D.	42	0.5
FL 14						N.D.	51	0.6
FL 15		·				100	47	0.6
FL 16						61	86	0.8
BTM 1	N.D.	5.4	N.D.	N.D.	N.D.			
BTM 2	38	24	6.2	16	300			
втм з	47	370	180	170	460			
BTM 4	N.D.	N.D.	N.D.	N.D.	N.D.			
BTM 5	45	330	96	32	390			<del>-</del>
BTM 6	N.D.	75	40	N.D.	33			
BTM 7	21	390	430	180	400			
BTM 8	N.D.	N.D.	N.D.	N.D.	N.D.			
8TM 9	N.D.	32	5.1	N.D.	5,0			

#### **Woodward-Clyde Consultants Chain of Custody Record** 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600 PROJECT NO. **ANALYSES** 90COURS A Number of Containers SAMPLERS: (Signature) REMARKS Sample Matrix (S)oil, (W)ater, (A)ir (Sample preservation EPA Method EPA Method handling procedures, etc.) SAMPLE NUMBER DATE TIME NA DT12 PT13 DT 14 DT 15 DT 16 FLIO FLII STMZ \*24 hour turnaround rest for 5 day turn-15774 37176 MKKI 12711 127712 WALLI WALLZ WALLS TOTAL NUMBER OF SOIL CONTAINERS RELINQUISHED BY: DATE/TIME RECEIVED BY : RELINQUISHED BY: DATE/TIME RECEIVED BY: ~(Signature) (Signature) (Signature) RECEIVED FOR LAB BY : SHIPPED BY: COURIER: DATE/TIME (Signature) (Signature) (Signature)

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

Hazardous Waste (#238)

• Drinking Water (#955)

Waste Water

Consultation

June 11, 1990

ChromaLab File No.: 0690015

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: George Ford

RE: Eleven soil samples for Total Lead and Oil & Grease analyses

Project Number: 90C0028A

Date Sampled: June 1, 1990 Date Extracted: June 4-8, 1990

Date Submitted: June 1, 1990 Date Analyzed: June 4-8, 1990

#### RESULTS:

Sample No.	Oil & Grease (mg/Kg)	Total Lead (mg/Kg)
FL1-1 FL2-1 FL3-1 FL3-2 FL3-3 FL4-1 FL5-1 FL6-1 FL6-1 FL7-1 FL8-1 FL9-1	56 N.D. N.D. 76 60 N.D. N.D. 87 N.D. N.D.	310 2.28 12.7 17.9 28.4 2.49 2.47 48.4 2.56 2.78 2.90
BLANK SPIKED RECOVERY DUPLICATED SPIKED RECOVERY DETECTION LIMIT METHOD OF ANALYSIS	N.D.  50 503 D&E	N.D. 102.8% 94.1% 0.05 7420

ChromaLab, Inc.

David Duong

Servor Chemist

Eric Tam

Laboratory Director

				93-300						<u> </u>											
PROJECT NO. 90C 00 Z8 A						- 1			7	ANA	LYS	ES	<u>.</u>			ys.					
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Analytical Laboratory
Specializing in GC-GC/MS
June 25, 1990

Environmental Analysis

Hazardous Waste (#E694)

• Drinking Water (#955)

Waste Water

ChromaLab File No.: 0690124

WOODWARD-CLYDE CONSULTANTS, INC. <u>Attn:</u> Bill Copeland <u>RE:</u> Twenty-five soil samples for Total Lead and Oil & Grease

analyses

Project Number: 90C0028A

Date Sampled: June 13, 1990 Date Submitted: June 13, 1990

Duration of Analysis: June 14-20, 1990

#### RESULTS:

Sample	Total Lead	Oil & Grease
No.	(mg/Kg)	(mg/Kg)
F1-1	411	110
F1-2	36.6	N.D.
F2-1	837	N.D.
F2-2	43.9	N.D.
F2-3	3.00	N.D.
F3-1	3.05	N.D.
F3-2	2.77	N.D.
F4-1	51.1	5 <b>5</b>
F4-2	26.2	N.D.
F4-3	4.12	N.D.
F5-1	4.23	N.D.
F5-2	14.0	N.D.
F6-1	5.53	82
F6-2	10.9	N.D.
F6-3	13.4	N.D.
F12-1	16.7	100
F12-2	3.15	N.D.
F11-1	15.5	52
F11-2	3.41	N.D.
F11-3	3.14	N.D.
F10-1	24.2	N.D.
F10-2	2.81	N.D.
F9-1	5.60	N.D.
F9-2	12.5	N.D.
F9-3	2.48	N.D.
F9-3		
BLANK	N.D.	N.D.
SPIKE RECOVERY	99.3%	
DUPLICATED SPIKE RECOVERY	106.6%	
DETECTION LIMIT	0.05	50
METHOD OF ANALYSIS	7420	503 D&E

ChromaLab, Inc.

David Duong Senior Chemist Juck -

Eric Tam Laboratory Director

Analytical Laboratory
Specializing in GC-GC/MS

June 25, 1990

Environmental Analysis

Hazardous Waste (#E694)

Drinking Water (#955)

Waste Water

Consultation

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

ChromaLab F

RE: Twenty-two soil samples for Total Lead and Oil & Grease

analyses

Project Number: 90C0028A

Date Sampled: June 13, 1990 Date Submitted: June 14, 1990

Duration of Analysis: June 16-20, 1990

#### RESULTS:

Sample No.	Total Lead (mg/Kg)	Oil & Grease (mg/Kg)
¥		
F7-1	149	110
F7-2	46.1	110
F7-3	142	69
F8-1	2630	120
F8-2	6.16	N.D.
F13-1	30.7	250
F13-2	35.9	65
F14-1	276	N.D.
F14-2	2.76	N.D.
F14-3	2.05	N.D.
F15-1	241	N.D.
F15-2	2.86	N.D.
F16-1	3.20	N.D.
F16-2	2.49	N.D.
F16-3	2.70	N.D.
F17-1	31.2	N.D.
F17-2	2.90	N.D.
F18-1	2.88	N.D.
F18-2	3.14	N.D.
F18-3	5.38	160
F24-1	3.02	N.D.
F24-2	3.20	N.D.
BLANK	N.D.	N.D.
SPIKE RECOVERY	92.4%	
DUPLICATED SPIKE RECOVERY	93.3%	
DETECTION LIMIT	0.05	50
METHOD OF ANALYSIS	7420	503 D&E

ChromaLab, Inc.

David Duong

-Senior Chemist

Eric Tam

Laboratory Director

(#E694)

(#955)

0690134

. Environmental Analysis

 Hazardous Waste Drinking Water

Waste Water

ChromaLab File No.:

## CHROMALAB, INC.

Analytical Laboratory Specializing in GC-GC/MS

June 25, 1990 WOODWARD#CLYDE CONSULTANTS, INC.

analyses

Attn: Bill Copeland Twenty-eight soil samples for Total Lead and Oil & Grease

Project Number: 9000028A

Date Submitted: June 14, 1990 Date Sampled: June 14, 1990

Duration of Analysis: June 16-20, 1990

#### RESULTS:

Sample No.	Total Lead (mg/Kg)	Oil & Grease (mg/Kg)
F23-1	423	420
F23-2	4.17	N.D.
F23-2	3.16	N.D.
F23-3 F22-1	3.58	N.D.
F22-2	3.02	N.D.
F21-1	2540	69
	4.34	N.D.
F21-2	2.53	N.D.
F21-3	212	N.D.
F20-1	3.12	N.D.
F20-2	62.2	59
F19-1	4 97	N D
F19-2 F19-3	9.31	N.D.
F28-1	2.48	N.D.
F28-2	2.70	N.D.
F39-1	3.69	N.D.
F39-2	3.01	N.D.
F39~3	2.71	N.D.
F40-1	3.00	N.D.
F40-2	2.76	N.D.
F41-1	5.24	N.D.
F41-2	2.59	N.D.
F41-3	4.62	N.D.
F42-1	2.77	N.D.
F42-1	4.17	N.D.
F42-2 F43-1	3.35	N.D.
	3.02	N.D.
F43-2	4.85	N.D.
F43-3	N.D.	N.D.
BLANK	92.4%	
SPIKE RECOVERY DUPLICATED SPIKE RECOVERY	101.2%	
	0.05	50
DETECTION LIMIT	7420	503 D&E
METHOD OF ANALYSIS	, 720	200

ChromaLab, Inc.

David Duong Senior Chemist Éric Tam

Laboratory Director

**Analytical Laboratory** Specializing in GC-GC/MS

- Environmental Analysis
- (#E694) Hazardous Waste
- (#955)Drinking Water

0690143

- Waste Water
- Consultation

ChromaLab File No.:

June 25, 1990

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland Twenty-seven soil samples for Total Lead and Oil & Grease

analyses

Project Number: 90C0028A

Date Sampled: June 14, 1990

June 14, 1990 Date Submitted:

Duration of Analysis: June 18-25, 1990

#### RESULTS:

Sample	Total Lead (mg/Kg)	Oil & Grease (mg/Kg)
No.	(mg/kg)	
F44-1	2.48	N.D.
F44-2	3.35	N.D.
F45-1	4.93	N.D.
F45-2	2.61	N.D.
F45-3	3.78	N.D.
•	54.6	74
F38-1	2.70	N.D.
F38-2	56.4	N.D.
F27-1	2.76	N.D.
F27-2	3.28	N.D.
F27-2 F36-1	10.0	N.D.
F36-2	4.24	N.D.
	84.3	4800
F35-1	811	N.D.
F35-2	3.13	N.D.
F35-3	3.56	N.D.
F34-1	4.49	N.D.
F34-2	3.41	N.D.
F26-1	3.80	N.D.
F26-2	3,46	N.D.
F25-1	2.65	N.D.
F25-2	3.87	N.D.
<b>₽33−1</b>	Z.50	N.D. N.D.
F33-2	2.74	N.D.
F33-3	4.36	N.D.
F30-1	3.81	
F30-2	2.59	N.D.
	N.D.	N.D.
BLANK	96.3%	age white state state
SPIKE RECOVERY	94.9%	
DUPLICATED SPIKE RECOVERY	0.05	50
DETECTION LIMIT	7420	503 D&E
METHOD OF ANALYSIS	1420	342 232

ChromaLab, Inc.

Eric Tam

Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583 415/831-1788 • Facsimile 415/831-8798 #\_ ...... IN 4100 04 401 67

Analytical Laboratory Specializing in GC-GC/MS June 25, 1990 Environmental Analysis

• Hazardous Waste (#E694)

Drinking Water (#

(#955)

Waste Water

ChromaLab File No.:

0690142

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

RE: Eleven soil samples for Total Lead and Oil & Grease analyses

Project Number: 90C0028A

Date Sampled: June 14, 1990 Date Submitted: June 14, 1990

Duration of Analysis: June 18-25, 1990

#### RESULTS:

Sample	Total Lead (mg/Kg)	Oil & Grease (mg/Kg)
No.		
F32-1 F32-2	50.4 3.49 5.69	N.D. N.D. N.D.
F31-1 F31-2	2.76 2.47	N.D. N.D.
F31-3 F29-1 F29-2	91.5 3.02	N.D. N.D.
F29-3 F37-1	3.11 147	N.D. N.D.
F37-2 F37-3	2.94 3.08	N.D. N.D.
BLANK SPIKE RECOVERY DUPLICATED SPIKE RECOVERY DETECTION LIMIT METHOD OF ANALYSIS	N.D. 94.9% 108.2% 0.05 7420	N.D.  50 503 D&E

ChromaLab, Inc.

David Duong

Senior Chemist

Eric Tam

### **Woodward-Clyde Consultants Chain of Custody Record** 500 12th Street, Suite 100, Oakland, CA 94607-4041 PROJECT NOGOC 0028 A **ANALYSES** Number of Containers SAMPLERS: (Signature) REMARKS Sample Matrix (S)oil, (W)ater, (A)ir (Sample preservation. handling EPA Method EPA Method procedures, etc.) SAMPLE NUMBER DATE TIME 5 day results to General or General or TOTAL NUMBER OF CONTAINERS DATE/TIME RECEIVED BY: RELINQUISHED BY : DATE/TIME RECEIVED BY: (Signature) (Signature) (Signature)

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	(Signature)	
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4	().	
	METHOD OF SHIPMENT :	

SHIPPED BY : (Signature)

COURIER: (Signature) RECEIVED FOR LAB BY :

DATE/TIME

		Street, Suite 100		kland, CA 94607-4041 600						Chain of Custody Recor								
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# Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600

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# Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600

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## Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041

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Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

 Hazardous Waste (#E694)

Drinking Water

Waste Water

(#955)

Consultation

331v 18, 19**90** 

ChromaLab File No.: 0790089

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: George Ford

RE: Fifteen rush soil samples for Oil & Grease, TTLC Lead and

STLC Lead analyses

Project Number: 90C0028A

Date Sampled: July 13, 1990 Date Submitted: July 13, 1991

Duration of Analysis: July 13-16, 1990

#### RESULTS:

Eample 40.	Oil & Grease (mg/Kg)	TTLC Lead (mg/Kg)	
3F - 1	N.D.	3.45	<del></del>
3F-2	N.D.	3.80	
30-3	N.D.	3.08	
3F-4	N.D.	2.99	
3.4 - 5	N.D.	2.75	
3F-6	N.D.	2.68	
3F-7	N.D.	4.50	
3n-8	N.D.	44.8	8.60
1 - 9	N.D.	3.13	
\$F-10	N.D.	2.58	
3F- 11	N.D.	3.45	
36-12	N.D.	3,69	
36-13	230	30.0	3.50
3:-+14	N.D.	393	
3H-15	71	368	
3.ANK	N.D.	N.D.	N.D.
SPIKE RECOVERY		97.9%	98.6%
TUPLICATE SPIKE RECOVERY		93.4%	100.0%
DETECTION LIMIT	50	0.05	0.10
VETHOD OF ANALYSIS	503 D&E	3050/7420	3010/7420*

\*Extracted per Title 22 WET procedure

Ihromatab, Inc.

-cavid Duong

Benjar Chemist

Eric Tam

Analytical Laboratory Specializing in GC-GC/MS July 19, 1990

Environmental Analysis

(#E694) Hazardous Waste

(#955)Drinking Water

Waste Water

ChromaLab File No.: 0790097

WOODWARD-CLYDE CONSULTANTS, INC.

Bill Copeland <u>Attn:</u>

Twenty-one rush soil samples for Oil & Grease, TT'\_C Lead and RE: STLC Lead analyses

90C0028A Project Number:

Date Submitted: July 13, 1990 Date Sampled: July 13, 1990

Duration of Analysis: July 13-16, 1990

RESULTS:

SW-ID16	1 & Grease (mg/Kg)	TTLC Lead (mg/Kg)	STLC Lea: (mg//:/
30.			
\$6-18	53	600	<del></del>
\$F-17	N.D.	385	
(2) (1년 (5) (1년	N.D.	3.36	
1971 - 19 1971 - 19	N.D.	19.4	* *
5 - 20 - 3 - 20	N.D.	3.08	•
	N.D.	3.37	AND THE CASE WITH
SF-21	N.D.	2.79	
SF - 22	N.D.	16.2	N.O.
SF -23	N.D.	44.2	4 , 90
SF -24	N.D.	31.1	N.D.
SF-25	N.D.	22.4	0.28
SF-26	N.D.	52.9	3.69
SF + 2	N.D.	49.6	3.2 <b>9</b>
SF-28	N.D.	70.8	11.0
SF-29	N.D.	42.1	1.22
SF-30	N.D.	48.6	4.03
SF-3"	N.D.	15.4	8.34
SF-32		5.70	
SF-33	N.D.	2.64	
SF-34	N.D.	9.47	
SF-35	N.D.	72.5	12.8
SF-36	N.D.	12.5	
	N. B	N.D.	N.D.
BLANK	N.D.	93.4%	98.6%
SPIKED RECOVERY		97.9%	100.0%
DUPLICATED SPIKED RECOVERY	/ <del></del>	0.05	0.10
DETECTION LIMIT	50		3010/7420*
METHOD OF ANALYSIS	503 D&E	3050/7420	3010,7120

<sup>\*</sup>Extracted per Title 22 WET procedure

ChromaLab, Inc.

Day+e Duong Senior Chemist Eric Tam Laboratory Director

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

• Hazardous Waste (#E694)

Drinking Water

(#955)

Waste Water

Waste water
 Consultation

July 18, 1990

ChromaLab File No.:

0790105

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

<u>RE:</u> Four rush soil samples for Oil & Grease and total Lead analyses

Project Number: 90C0028A

Date Sampled: July 16, 1990
Date Extracted: July 16-17, 1990

Date Submitted: July 16, 1990 Date Analyzed: July 16-17,1990

RESULTS:

Sample No.	Total Lead (mg/Kg)	Oil & Grease (mg/Kg)
CE 27	1.72	N.D.
SF-37	= : : =	
SF-38	4.16	N.D.
SF-39	3.59	N.D.
SF-40	3.01	N.D.
BLANK	N.D.	N.D.
SPIKE RECOVERY	97.9%	
DUP. SPIKE RECOVERY	100.0%	_ <del></del>
DETECTION LIMIT	0.05	50
METHOD OF ANALYSIS	7420	503 D&E

ChromaLab, Inc.

David Duong

Senior Chemist

Eric Tam

# Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600

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### **Woodward-Clyde Consultants**

500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600

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### **Woodward-Clyde Consultants Chain of Custody Record** 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600 PROJECT NO. 1000 201 **ANALYSES Number of Containers** REMARKS SAMPLERS: Signature Opelan Sample Matrix (S)oil, (W)ater, (A)ir (Sample preservation, EPA Method EPA Method EPA Method EPA Method handling procedures, etc.) SAMPLE NUMBER DATE TIME Do CHM NET PS only if sample talal Pb \$ 100 ppm and \$ 910 ppm results to B. Copeland TOTAL NUMBER OF CONTAINERS RELINQUISHED BY: DATE/TIME **RELINQUISHED BY:** DATE/TIME RECEIVED BY: (Signature) (Signature) METHOD OF SHIPMENT : SHIPPED BY: COURIER: RECEIVED FOR LAB BY: DATE/TIME (Signature) (Signature) (Signature)

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

 Hazardous Waste (#E694)

 Drinking Water (#955)

Waste Water

Consultation

July 5, 1990

ChromaLab File No.: 0790022

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

RE: Twelve rush soil samples for Total Lead and Oil & Grease analyses

90C0028A Project Number:

Date Submitted: July 3, 1990 Date Sampled: July 3, 1990 Date Analyzed: July 3-5, 1990 Date Extracted: July 3-5, 1990

#### RESULTS:

Sample No.	Lead (mq/Kg)	Oil & Grease (mg/Kg)
MD4 4	2.25	N D
TP1-1	2.37	N.D.
TP1-2	3.16	N.D.
TP1-3	2.33	N.D.
TP2-1	694	N.D.
TP2-2	2.43	N.D.
TP2-3	2.08	N.D.
TP2-4	4.05	N.D.
TP3-1	2.87	N.D.
TP3-2	1.99	N.D.
TP3-3	2.53	N.D.
TP4-1	169	N.D.
TP4-2	2.41.	N.D.
BLANK	N.D.	N.D.
SPIKE RECOVERY	99.48	
DUP SPIKE RECOVERY	97.8%	<del></del>
DETECTION LIMIT	0.05	50
METHOD OF ANALYSIS	7420	503 D&E

ChromaLab, Inc.

David Duong

Senior Chemist

Eric Tam

## Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600

	(415) 893-3600							ANALYSES								1	<del></del>
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DATE	TIME	SAMI	PLE NUMBER	Sample Matrix (S)oil, (W)ater, (A)ir	EPA Method	EPA Methoo	EPA Method	EPA Method	total ,	530						Number	handling procedures, etc.)
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		TP2	·3 -/		-												
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			- 3	7 9 1					1								
			-4		-												
		TP3	-/		╁						_						
			<u>- 2</u> - 3		<del>                                     </del>	-											
		TP4															
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					-	-		_		<u> </u>							Results by FRIDAY
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		<del>                                     </del>			+	_	-	-	-	<u> </u>	-	-	$\vdash$		-		Results to B. Copeland
<b></b>					+-	-		-		-	-				-		B-Copelana
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					$\dagger$	-	-	-	-		-				<del> </del>		
														TOT IBER	OF	12	Soil
RELINO (Signati	UISHED (	BY:	DATE/TIME	RECEIVED E (Signature)	B <b>Y</b> :	<u> </u>	- <del></del>		IELIN Signa			BY:			DA	TE/TIM	AECEIVED BY : (Signature)
метно	D OF SHI	PMENT :	1-11	SHIPPED B' (Signature)	<b>/</b> :				COUR Signa						(Sig	mature	DEORLABBY: DATE/TIME

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

Hazardous Waste (#E694)

Drinking Water (

(#955)

Waste Water

Consultation

July 20, 1990

ChromaLab File No.:

0790138

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

RE: Three rush composited soil samples for Lead and Oil & Grease analyses

Project Number: 90C0028A

Date Sampled: July 19, 1990
Date Extracted: July 20, 1990

Date Submitted: July 19, 1990

Date Analyzed: July 20, 1990

RESULTS:

Sample No.	Total Lead (mg/Kg)	Oil & Grease (mg/Kg)
Z1-1,2,3,4 Z2-1,2,3,4	84.0 94.8	N.D. N.D. N.D.
Z3-1,2,3,4	37.7	N.D.
BLANK	N.D.	N.D.
SPIKE RECOVERY	99.1%	
DETECTION LIMIT	0.05	50
METHOD OF ANALYSIS	7420	503 D&E

ChromaLab, Inc.

David Duong

Senior Chemist

Eric Tam

Analytical Laboratory
Specializing in GC-GC/MS

. Environmental Analysis

• Hazardous Waste (#E694)

Drinking Water (#955)

Waste Water

Consultation

July 23, 1990

ChromaLab File No.: 0790146

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

RE: Two rush composited soil samples for Oil& Grease and Total Lead analyses

Project Number: 90c0028A

Date Sampled: July 20, 1990 Date Submitted: July 20, 1990 Date Extracted: July 20-23,1990 Date Analyzed: July 20-23,1990

#### RESULTS:

Sample No.	Lead (mg/Kg)	Oil & Grease (mg/Kg)
24-1,2,3,4	24.0	54 N. D.
25-1,2,3,4	48.8	N.D.
BLANK	N.D.	N.D.
SPIKE RECOVERY	95.8%	
DETECTION LIMIT	0.05	50
METHOD OF ANALYSIS	7420	503 D&E

ChromaLab, Inc.

David Duong

Senior Chemist

Eric Tam

Analytical Laboratory Specializing in GC-GC/MS July 23, 1990

Environmental Analysis

 Hazardous Waste (#E694)

 Drinking Water (#955)

Waste Water

ChromaLab File No.: 0790138 A

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

Date Sampled: July 19, 1990 Date Extracted: July 20, 1990

Date Submitted: July 19, 1990 Date Analyzed: July 23, 1990

Project Number: 90C0028A Sample I.D.: Z1-1,2,3,4

Method of Analysis: EPA 8270

Matrix: Soil

**RESULTS:** 

#### POLYNUCLEAR AROMATIC HYDROCARBONS by GC/MS

Sample (mg/Kg)	MDL (mg/Kg)	Spike <u>Recovery</u>
N.D.	0.5	
N.D.	0.5	
N.D.	0.5	113.3%
N.D.	0.5	
N.D.	0.5	108.2%
N.D.	0.5	
N.D.	0.5	113.5%
N.D.	0.5	
	(mg/Kg)  N.D. N.D. N.D. N.D. N.D. N.D. N.D. N.	(mg/Kg)     (mg/Kg)       N.D.     0.5

ChromaLab, Inc.

David Duong

Senior Chemist

Eric Tam

Analytical Laboratory Specializing in GC-GC/MS

July 23, 1990

Environmental Analysis

 Hazardous Waste (#E694)

 Drinking Water (#955)

Waste Water

• Consultation ChromaLab File No.: 0790138 B

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

Date Sampled: July 19, 1990 Date Extracted: July 20, 1990 Date Submitted: July 19, 1990 Date Analyzed: July 23, 1990

Project Number: 90C0028A Sample I.D.: Z2-1,2,3,4

Method of Analysis: EPA 8270

Matrix: Soil

RESULTS:

#### POLYNUCLEAR AROMATIC HYDROCARBONS by GC/MS

	Sample	$\mathtt{MDL}$	Spike
Compound Name	(mq/Kq)	(mg/Kg)	Recovery
NAPHTHALENE	N.D.	0.5	
ACENAPHTHYLENE	N.D.	0.5	
ACENAPHTHENE	N.D.	0.5	113.3%
FLUORENE	N.D.	0.5	
PHENANTHRENE	N.D.	0.5	108.2%
ANTHRACENE	N.D.	0.5	
FLUORANTHENE	N.D.	0.5	
PYRENE	N.D.	0.5	
BENZO (A) ANTHRACENE	N.D.	0.5	
CHRYSÈNE	N.D.	0.5	113.5%
BENZO (B) FLUORANTHENE	N.D.	0.5	
BENZO (K) FLUORANTHENE	N.D.	0.5	
BENZO (A) PYRENE	N.D.	0.5	
IDENO(1,2,3 C,D)PYRENE	N.D.	0.5	
DIBENZO(A, H) ANTHRACENE	N.D.	0.5	
BENZO(G,H,I)PERYLENE	N.D.	0.5	

ChromaLab, Inc.

Dayid Duong

Senior Chemist

Eric Tam

Analytical Laboratory
Specializing in GC-GC/MS
July 23, 1990

Environmental Analysis

Hazardous Waste (#E694)

Drinking Water (#955)

Waste Water

ChromaLab File No.: 0790138 C

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

Date Sampled: July 19, 1990
Date Extracted: July 20, 1990

Date Submitted: July 19, 1990 Date Analyzed: July 23, 1990

Project Number: 90C0028A Sample I.D.: Z3-1,2,3,4 Method of Analysis: EPA 8270

Matrix: Soil

RESULTS:

#### POLYNUCLEAR AROMATIC HYDROCARBONS by GC/MS

	Sample	$\mathtt{MDL}$	Spike
Compound Name	(mg/Kg)	(mq/Kq)	Recovery
NAPHTHALENE	N.D.	0.5	
ACENAPHTHYLENE	N.D.	0.5	
ACENAPHTHENE	N.D.	0.5	113.3%
FLUORENE	N.D.	0.5	
PHENANTHRENE	N.D.	0.5	108.2%
ANTHRACENE	N.D.	0.5	
FLUORANTHENE	N.D.	0.5	
PYRENE	N.D.	0.5	
BENZO (A) ANTHRACENE	N.D.	0.5	
CHRYSENE	N.D.	0.5	113.5%
BENZO (B) FLUORANTHENE	N.D.	0.5	
BENZO(K) FLUORANTHENE	N.D.	0.5	
BENZO (A) PYRENE	N.D.	0.5	
IDENO(1,2,3 C,D)PYRENE	N.D.	0.5	
DIBENZO (A, H) ANTHRACENE	N.D.	0.5	
BENZO(G,H,I)PERYLENE	N.D.	0.5	

ChromaLab, Inc.

David Duong

Senior Chemist

Eric Tam

Analytical Laboratory
Specializing in GC-GC/MS
July 23, 1990

Environmental Analysis

Hazardous Waste (#E694)

• Drinking Water (#955)

Waste Water

• Consultation ChromaLab File No.: 0790146 A

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

Date Sampled: July 20, 1990
Date Extracted: July 20, 1990

Date Submitted: July 20, 1990 Date Analyzed: July 23, 1990

Project Number: 90C0028A Sample I.D.: Z4-1,2,3,4

Method of Analysis: EPA 8270

Matrix: Soil

#### RESULTS:

#### POLYNUCLEAR AROMATIC HYDROCARBONS by GC/MS

Compound Name	Sample (mg/Kg)	MDL (mg/Kg)	Spike <u>Recovery</u>
NAPHTHALENE	N.D.	0.5	
ACENAPHTHYLENE	N.D.	0.5	
ACENAPHTHENE	N.D.	0.5	113.3%
FLUORENE	N.D.	0.5	
PHENANTHRENE	N.D.	0.5	108.2%
ANTHRACENE	N.D.	0.5	
FLUORANTHENE	N.D.	0.5	
PYRENE	N.D.	0.5	
BENZO (A) ANTHRACENE	N.D.	0.5	
CHRYSÈNÉ	N.D.	0.5	113.5%
BENZO (B) FLUORANTHENE	N.D.	0.5	
BENZO (K) FLUORANTHENE	N.D.	0.5	
BENZO (A) PYRENE	N.D.	0.5	
IDENO(1,2,3 C,D)PYRENE	N.D.	0.5	
DIBENZO (A, H) ANTHRACENE	N.D.	0.5	
BENZO(G,H,I)PERYLENE	N.D.	0.5	

ChromaLab, Inc.

David Duong
Senior Chemist

Eric Tam

Analytical Laboratory Specializing in GC-GC/MS July 23, 1990

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

Date Sampled: July 20, 1990 Date Extracted: July 20, 1990 Date Submitted: July 20, 1990 Date Analyzed: July 23, 1990

 Environmental Analysis Hazardous Waste

Drinking Water

Waste Water

• Consultation ChromaLab File No.:

(#E694)

(#955)

0790146 B

Project Number: 90C0028A Sample I.D.: Z5-1,2,3,4

Matrix: Soil Method of Analysis: EPA 8270

RESULTS:

#### POLYNUCLEAR AROMATIC HYDROCARBONS by GC/MS

Compound Name	Sample (mg/Kg)	MDL (mg/Kg)	Spike Recovery
COMPOUND Name		(mg/11g/	1000 102 7
NAPHTHALENE	N.D.	0.5	
ACENAPHTHYLENE	N.D.	0.5	
ACENAPHTHENE	N.D.	0.5	113.3%
FLUORENE	N.D.	0.5	
PHENANTHRENE	N.D.	0.5	108.2%
ANTHRACENE	N.D.	0.5	
FLUORANTHENE	N.D.	0.5	
PYRENE	N.D.	0.5	
BENZO (A) ANTHRACENE	N.D.	0.5	
CHRYSÈNE	N.D.	0.5	113.5%
BENZO(B) FLUORANTHENE	N.D.	0.5	
BENZO (K) FLUORANTHENE	N.D.	0.5	
BENZO (A) PYRENE	N.D.	0.5	
IDENO(1,2,3 C,D) PYRENE	N.D.	0.5	
DIBENZO (A, H) ANTHRACENE	N.D.	0.5	
BENZO(G,H,I) PERYLENE	N.D.	0.5	

ChromaLab, Inc.

David Duong

Senior Chemist

Eric Tam

### **Woodward-Clyde Consultants** CHROMALAB FILE # 790138 Chain 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600 PROJECT NO. 90COOZ8A ANALYSES Number of Containers REMARKS SAMPLERS: (Signature) Sample Matrix (S)oil, (W)ater, (A)ir (Sample preservation. handling EPA Method procedures, etc.) SAMPLE NUMBER DATE TIME Composite Composite Composite ASAP TAT 71-1 - <u>Z</u> -4 Call B. Copuland or G. Ford W/ results ASAP, pls. 874-3192 pls. 874-3203 TOTAL NUMBER OF CONTAINERS RECEIVED BY: DATECTIME RECEIVED BY: RELINQUISHED BY: RELINQUISHED BY : DATE/TIME (Signature) (Signature) (Signature) (Signature) RECEIVED FOR AB BY : METHOD OF SHIPMENT : SHIPPED BY: COURIER: DATE/YIME (Signature) (Signature)

<b>W</b> (	Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600						•	Chain of Custody Record											
		7000 jggaturen	0 Z8 A peland	$\frown$ $\Box$					(46rage	LYS	ES .	22			Number of Containers		REMARI (Sample preservati	•	
DATE	TIME		E NUMBER	S (S)	EPA Method	EPA Method	EPA Method	EPA Method	532 0	Total 1	PNAS	28			Number of		handling procedures,	}	
7/20		24-	2	<u> </u>					<u>У</u>	X	<u>×</u>				(	>	Compo.	siti	
		Z5-	7 7 7 3						X	<b>X</b>	X				(	3	Composi	te	
			7														24 hr		
																(			
																Λl	zults to B-Cop	, Jan	l
																	B. Cop ASAT	2	
													NUME	TOTAL BER OF VINERS	8				
RELINC (Signati	UISHED I	3	DATE/TIME	RECEIVED (Signature)	BY:					QUIS ture)		BY:	<u> </u>		DATE/TI	ME	RECEIVED BY (Signature)	:	
METHOD OF SHIPMENT : SHIP			SHIPPED BY : (Signature)				ilER :					RECEIVED FOR LAB BY : DATE/TIME (Signature)			TIME				

Analytical Laboratory Specializing in GC-GC/MS . Environmental Analysis

. Hazardous Waste (#238)

 Drinking Water (#955)

. Waste Water

Consultation

May 14, 1990

ChromaLab File No.: 0590040

Page 1 of 2

WOODWARD-CLYDE CONSULTANTS, INC.

George Ford Attn:

Thirty soil samples for Gasoline/BTEX, Oil & Grease, Total

Lead, and Wet Lead analyses

Project Number: 90C0028A

Date Sampled: May 4, 1990 Date Submitted: May 4, 1990

Duration of Analysis: May 4-12, 1990

SULTS:

				Ethyl	lotai	OTI &	LILC	SHLC
mple	Gasoline						Lead	Lead
No.	(mg/Kg)	<u>(µg/Kg)</u>	(ug/Kg)	(µg/Kg)	<u>(µg/Kg)</u>	(mg/Kg)	(mg/Kg)	(mg/L)
DT 12	N.D.	19	15	N.D.	8.1			
DT 13	7.1	34	150	170	800			
DT 14	3° .	150	450	830	3100			
OT 15	55	N.D.	N.D.	7.2	39			
DT 16	1000	800	3200	4100	12000			
DT 17	27	N.D.	N.D.	7.3	120			
FL		- <b></b>				N.D.	55	0.7
FL 10						N.D.	74	0.6
FL :1						N.D.	37	0.2
FL 12				~~~		N.D.	78	0.5
FL 13	<del></del>					N.D.	42	0.5
FL 14						N.D.	51	0.6
FL 15						100	47	0.6
FL 16	<b></b>					61	86	0.8
BTM 1	N.D.	5.4	N.D.	N.D.	N.D.			
BTM 2	38	24	6.2	16	300			
втм з	47	370	180	170	460			
8TM 4	N.D.	N.D.	N.D.	N.D.	N.D.			
BTM 5	45	330	96	32	390			
BTM 6	N.D.	75	40	N.D.	33		~	
BTM 7	21	390	430	180	400			_
BTM 8	N.D.	N.D.	N.D.	N.D.	N.D.	~~~ <b>~</b>		•
BTM 9	N.D.	32	5.1	N.D.	5,0			•••

**Analytical Laboratory** Specializing in GC-GC/MS · Environmental Analysis

 Hazardous Waste (#238)

 Drinking Water (#955)

Waste Water

Consultation

May 14, 1990

ChromaLab File No.: 0590040

Page 2 of 2

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: George Ford

RE: Thirty soil samples for Gasoline/BTEX, Oil & Grease, Total Lead, and Wet Lead analyses

Project Number: 90C0028A

Date Sampled: May 4, 1990 Date Duration of Analysis: May 4-12, 1990 Date Submitted: May 4, 1990

RESULIS:

Sample No.	Gasoline (mg/Kg)	Benzene (ug/Kg)	Toluene (шg/Kg)	Ethyl Benzene (ug/Kg)			TTLC Lead (mg/Kg	Lead
MLK 1	890	3500	10000	7500	14000			== +
MLK 2	N.D.	N.D.	N.D.	N.D.	N.D.			
12 TH 1	N.D.	N.D.	N.D.	N.D.	N.D.			-
12 TH 2	N.D.	N.D.	N.D.	N.D.	N.D.			
WALL 1	N.D.	N.D.	N.D.	N.D.	N.D.			
WALL 2	N.D.	N.D.	N.D.	N.D.	N.D.			,
WALL 3	N.D.	N.D.	N.D.	N.D.	N.D.			· •••••••••
BLANK SPIKED	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
RECOVERY DUP SP.	90.4%	91.4%	88.2%	98.5%	98.7%		101.3%	102.2%
RECOVERY DETECTION	95.2%	96.7%	90.1%	99.6% 1	09.5%		101.2%	104.7%
LIMIT METHOD OF	2.5 MOD.	5	5	5	5	50 503 ;	0.1 3050/	0.1 1310/3010
ANALYSIS	8015	8020	8020	8020	8020	D&E	7420	7420

ChromaLab, Inc.

Dayid Duong

or Chemist



NET Pacific, Inc. 435 Tesconi Circle Santa Rosa, CA 95401 Tel: (707) 526-7200 Fax: (707) 526-9623

George Ford Woodward-Clyde Cons. 500 12th Street, Suite 100 Oakland, CA 94607-4014 Date: 08-23-90

NET Client Acct No: 120 NET Pacific Log No: 3298 Received: 08-10-90 2300

Client Reference Information

Project: 90C0028A

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

Jules Skamarack Laboratory Manager

JS:rct Enclosure(s) Client No: 120 Client Name: Woodward-Clyde Cons. NET Log No: 3298

Date: 08-23-90

Page: 2

Ref: Project: 90C0028A

			8-1 08-10-90	B-2 08-10-90	
Parameter	Method	Reporting Limit	60269	60270	Units
PETROLEUM HYDROCARBONS VOLATILE (SOIL) DILUTION FACTOR * DATE ANALYZED METHOD GC FID/5030 as Gasoline METHOD 8020 DILUTION FACTOR * DATE ANALYZED Benzene Ethylbenzene Toluene Xylenes, total		1 2.5 2.5 2.5 2.5	100 08-21-90  320  100 08-21-90 ND ND ND ND	 1 08-22-90  1.5  1 08-22-90 ND ND ND	mg/Kg ug/Kg ug/Kg ug/Kg ug/Kg

Client No: 120 Client Name: Woodward-Clyde Cons. NET Log No: 3298

Date: 08-23-90

Page: 3

Ref: Project: 90C0028A

			B-3 08-10-90	B-4 08-10-90	
Parameter	Method	Reporting Limit	60271	60272	Units
PETROLEUM HYDROCARBONS VOLATILE (SOIL) DILUTION FACTOR * DATE ANALYZED METHOD GC FID/5030 as Gasoline METHOD 8020 DILUTION FACTOR * DATE ANALYZED Benzene Ethylbenzene Toluene Xylenes, total		1 2.5 2.5 2.5 2.5	 1 08-21-90  ND  1 08-21-90 ND ND ND	100 08-21-90  1,800  100 08-21-90 ND ND ND ND	mg/Kg ug/Kg ug/Kg ug/Kg ug/Kg

Client No: 120

Client Name: Woodward-Clyde Cons. NET Log No: 3298

Page: 4

Date: 08-23-90

Ref: Project: 90C0028A

			8-5 08-10-90	B-6 08-10-90	
Parameter	Method	Reporting Limit	60273	60274	Units
PETROLEUM HYDROCARBONS VOLATILE (SOIL) DILUTION FACTOR * DATE ANALYZED METHOD GC FID/5030 as Gasoline METHOD 8020 DILUTION FACTOR * DATE ANALYZED Benzene Ethylbenzene Toluene Xylenes, total		1 2.5 2.5 2.5 2.5	100 08-21-90  6,900  100 08-21-90 ND ND ND 19,000	1 08-21-90  ND  1 08-21-90 ND ND ND ND	mg/Kg ug/Kg ug/Kg ug/Kg ug/Kg

Client No: 120 Client Name: Woodward-Clyde Cons. NET Log No: 3298

Date: 08-23-90

Page: 5

Ref: Project: 90C0028A

Descriptor,	Lab	No.	and	Results

			8-7 08-10-90	B-8 08-10-90	
Parameter ·	Method	Reporting Limit	60275	60276	Units
PETROLEUM HYDROCARBONS VOLATILE (SOIL) DILUTION FACTOR * DATE ANALYZED METHOD GC FID/5030 as Gasoline METHOD 8020 DILUTION FACTOR * DATE ANALYZED Benzene Ethylbenzene Toluene Xylenes, total		1 2.5 2.5 2.5 2.5 2.5	 1 08-21-90  ND  1 08-21-90 ND ND ND	 1 08-21-90  ND  1 08-21-90 ND ND ND ND	mg/Kg ug/Kg ug/Kg ug/Kg ug/Kg

Client No: 120

Client Name: Woodward-Clyde Cons. NET Log No: 3298

Date: 08-23-90

Page: 6

Ref: Project: 90C0028A

			B-9 08-10-90	F-1 08-10-90	Units	
Parameter	Method	Reporting Limit	60277	60278		
PETROLEUM HYDROCARBONS VOLATILE (SOIL) DILUTION FACTOR * DATE ANALYZED METHOD GC FIC/5030 as Gasoline METHOD 8020 DILUTION FACTOR * DATE ANALYZED Benzene Ethylbenzene Toluene Xylenes, total	-	1 2.5 2.5 2.5 2.5 2.5	 1 08-21-90  11  1 08-21-90 ND ND ND ND	1 08-21-90  ND  1 08-21-90 ND ND ND	mg/Kg ug/Kg ug/Kg ug/Kg ug/Kg	

Client No: 120 Client Name: Woodward-Clyde Cons. NET Log No: 3298

Date: 08-23-90

Page: 7

Ref: Project: 90C0028A

			F-2 08-10-90	F-3 08-10-90	
Parameter	Method	Reporting Limit	60279	60280	Units
PETROLEUM HYDROCARBONS VOLATILE (SOIL) DILUTION FACTOR * DATE ANALYZED METHOD GC FID/5030 as Gasoline METHOD 8020 DILUTION FACTOR * DATE ANALYZED Benzene Ethylbenzene Toluene Xylenes, total		1 2.5 2.5 2.5 2.5 2.5	 1 08-21-90  ND  1 08-21-90 ND ND ND	 1 08-21-90  ND  1 08-21-90 ND ND ND ND	mg/Kg ug/Kg ug/Kg ug/Kg ug/Kg

Client Acct: 120 Client Name: Woodward-Clyde Cons. NET Log No: 3298

Ref: Project: 90C0028A

Date: 08-23-90

Page: 8

#### QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Gasoline	1	mg/Kg	108	ND	93	92	1.1
Benzene	2.5	ug/Kg	99	ND	92	90	2.2
Toluene	2.5	ug/Kg	102	ND	94	92	2.2
Gasoline	1	mg/Kg	103	ND	80	77	3.4
Benzene	2.5	ug/Kg	105	2.7	89	85	4.2
Toluene	2.5	ug/Kg	110	2.8	93	90	3.3

COMMENT: Blank Results were ND on other analytes tested.

#### KEY TO ABBREVIATIONS and METHOD REFERENCES

: Less than; When appearing in results column indicates analyte not detected at the value following, which supercedes the listed reporting limit.

mean : Average; sum of measurements divided by number of measurements.

mg/Kg (ppm): Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis

(parts per million).

mg/L : Concentration in units of milligrams of analyte per liter of sample.

mL/L/hr : Milliliters per liter per hour.

MPN/100 mL : Most probable number of bacteria per one hundred milliliters of sample.

N/A : Not applicable.

<

NA : Not analyzed.

NO : Not detected; the analyte concentration is less than applicable listed

reporting limit.

NTU : Nephelometric turbidity units.

RPO : Relative percent difference, 100 [Value 1 - Value 2]/mean value.

SNA : Standard not available.

ug/Kg (ppb): Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis

(parts per billion).

ug/L : Concentration in units of micrograms of analyte per liter of sample.

umhos/an : Micramhos per centimeter.

#### Method References

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

\* Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated reporting limits by the dilution factor.

### **Woodward-Clyde Consultants Chain of Custody Record** 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600 **ANALYSES** PROJECT NO. 900002BA Number of Containers REMARKS SAMPLERS: (Signature) Sample Matrix (S)oil, (W)ater, (A)ir (Sample preservation, EPA Method EPA Method handling procedures, etc.) DATE TIME SAMPLE NUMBER NA B/10/90 B-1 3-2 B-3 **B-8** F-1 TOTAL NUMBER OF CONTAINERS RECEIVED BY : 8/10/70 RELINQUISHED BY DATE/TIME RELINQUISHED BY: DATE/TIME RECEIVED BY : (Signature) (Signature) (Signature) 8/10/50 10:30

COURIER:

(Signature)

RECEIVED FOR LAB BY:

(Signature)

DATE/I'ME

METHOD OF SHIPMENT:

(VIA NOS)

SHIPPED BY :

(Signature)

#### **Woodward-Clyde Consultants**

Chain of Custody # 900197

September 20, 1990

George Ford Woodward-Clyde Consultants 500 12th Street; Suite #100 Oakland, CA 94607-4014

Dear Mr. Ford:

Enclosed is the report for (Project ID 90C0028A) samples which were received at Woodward-Clyde Analytical Laboratory September 17, 1990. Faxed results for the organic analysis was sent to you on September 18, 1990.

The report consists of the following sections:

I Analysis Results

No problems were encountered with the analysis of your samples.

If you have any questions, please feel free to call.

Sincerely,

Edward R. Morales

Lab Manager

## TOTAL PETROLEUM HYDROCARBONS MODIFIED EPA METHOD 8015

PROJECT NAME: BRAMALEA PACIFIC

PROJECT NUMBER: 9000028A
PROJECT MANAGER: GEORGE FORD

COC# 900197

						DETECTION	
WCC LAB ID	SAMPLE ID	MATRIX	COLLECTION DATE	EXTRACTION DATE	ANALYSIS DATE	LIMIT (ug/L)	TPH (ug/L)
METHOD BLANK		WATER	-	09-17-90	09-17-90	50	ND
900197-01-02	gw1	WATER	09-17-90	09-17-90	09-17-90	50	140
900197-02-02	g <b>₩2</b>	WATER	09-17-90	09-17-90	09-17-90	50	840

Quantitated as Leaded Gasoline.

REVIEWED BY:

#### CAM 17 METALS ANALYSES

PROJECT NAME: BRAMELEA PACIFIC PROJECT NUMBER: 90C0028A

PROJECT MANAGER: GEORGE FORD

COC#: 900197 CONC UNITS: mg/L METHOD: 6010 & 7000

MATRIX: WATER

WCC LAB ID: SAMPLE ID: DATE ANALYZED	METHOD BLANK 9-19-90	900197-01-05 GW1 1 9-19-90	900197-02-05 GW2 9-19-90	DETECTION LIMIT	STLC LIMITS (mg/L)	TTLC LIMITS (mg/kg)
ANTIMONY	ND	0.27	0.48	0.05	15	500
ARSEVIC	ND	0.005	0.007	0.001	5.0	500
BARIUM	ND	0.22	0.66	0.05	100	10000
BERYLLIUM	ND	ND	ND	0.007	0.75	75
CADMIUM	ND	0.02	0.06	ວ.02	1.0	100
CHROMEUM	ND	0.17	0.49	0.02	560	2500
COBALT	ND	ND	0.18	0.05	30	8000
COPPER	ND	0.02	0.07	3.01	25	2500
LEAD*	ND	ND	0.07	0.05	5.0	1000
MERCURY	ND	0.0006	0.0004	0.0002	0.2	20
MOLYBOENUM*	ND	ND	ND	0.02	350	3500
NICKEL*	ND	0.12	0.26	0.03	20	2000
SELENIUM*	ND	DN	ND	0.05	1.0	100
SILVER	ND	ND	0.04	. 0.02	5	500
THALLIUM*	ND	ND	ND	0.08	7.0	700
VANADILM*	ND	0.09	0.16	0.01	24	2400
ZINC	ND	0.14	C.27	0.05	250	5000

\* - ANALYZED BY ETC SANTA ROSA

REVIEWED BY:

BENZENE, TOLUENE, ETHYLBENZENE, XYLENES DATA SHEET

CLIENT: BRAMELEA PACIFIC

PROJECT: 90C0028A
'ROJ.MGR.: GEORGE FCRD

DATE RECEIVED: 09-17-90

METHOD ID: Mod. 8020

UNITS: ug/L

WCC LAB ID	: METHOD	900197-01-02	900197-02-02
SAMPLE ID LINE 1	: BLANK	GW1	GW2
SAMPLE ID LINE 2	! <b>:</b>		
DATE SAMPLED	:	09-17-90	09-17-90
DATE ANALYZED		09-17-90	09-17-90
DETECTION LIMIT		0.5	5
DETECTION ETHIS			
BENZENE	NO	0.7	8
OLUENE	NO	5.4	110
THYLBENZENE	ND	2.9	46
XYLENES	ND	57	430

QUALITY ASSURANCE INFORMATION

AVG REC #1	AVG REC #2	AVG RPD
82	85	4

NO - NOT DETECTED: SAMPLE CONTAINED THE PARAMETER BELOW THE PRACTICAL QUANTITATION LIMIT.

REVIEWED BY:

**\_\_\_\_** 

#### VOLATILE ORGANICS ANALYSIS DATA SHEET

.IENT: BRAMELEA PACIFIC

PROJECT: 90C0028A PROJ.MGR.: GEORGE FORD DATE RECEIVED: 09-17-90

METHOD ID: 8010 UNITS: ug/L

WCC LAB ID: METHOD SAMPLE ID LINE 1: BLANK	900197-01-01 GW1	900197-02-01 GW2
SAMPLE ID LINE 2: DATE SAMPLED:	09-17-90	09-17-90
DATE ANALYZED: 09-17-90	09-17-90	09-17-90
DETECTION LIMIT: 0.5	0.5	0.5

DATE SAMPLED:		09-17-90	<b>3</b> , 11 , <b>0</b>
DATE ANALYZED: C	9-17-90	09-17-90	09-17-90
DETECTION LIMIT:	0.5	0.5	0.5
SROMOD I CHLOROMETHANE	ND	ND	ND
BROMOFORM	ND	ND	ND
ROMOMETHANE	ND	ND	ND
ARBON TETRACHLORIDE	ND	ND	ND
CHLOROBENZENE	ND	ND	ND
CHLOROETHANE	ND	ND	ИD
-CHLOROETHYLVINYL ETHER	NO	NO	ND
HLOROFORM	МÐ	3.1	4.0
CHLOROMETHANE	ND	ND	ND
DIBROMOCHLOROMETHANE	ND	ND	ND
.2-DICHLOROBENZENE	ND	ND	ND
.,3-DICHLOROBENZENE	ND	ND	ND
1,4-DICHLOROBENZENE	ND	ND	ND
[CHLORODIFLUOROMETHANE	ND	ND	ND
,1-DICHLOROETHANE	ND	ND	ND
1,2-DICHLOROETHANE	ND	ND	ND
1,1-DICHLOROETHENE	ND	ND	ND
RANS-1,2-DICHLOROETHENE	ND	ND	ND
,2-DICHLOROPROPANE	ND	ND	ND
CIS-1,3-DICHLOROPROPENE	ND	ND	ND
TRANS-1,3-DICHLOROPROPEN	E ND	ND	ND
ETHYLENE CHLORIDE	ND	ND	ND
,1,2,2-TETRACHLOROETHAN	E ND	ND	ND
TETRACHLOROETHENE	ND	5.5	9.9
1,1,1-TRICHLOROETHANE	ND	ND	ND
,1,2-TRICHLOROETHANE	ND	NO	ND
IRICHLOROETHENE	ND	ND	ND
TRICHLOROFLUOROMETHANE	ND	ND	ND
INYL CHLORIDE	ND	ND	ND

QUALITY	ASSURANCE	INFORMATION

AVG REC #1	AVG REC #2	AVG RPD
100	114	12

NO - NOT DETECTED: SAMPLE CONTAINED THE PARAMETER BELOW THE PRACTICAL QUANTITATION LIMIT.

REVIEWED BY:

#### VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT: BRAMELEA PACIFIC

\_PROJECT: 90C0328A ROJ.MGR.: GEORGE FORD DATE RECEIVED: 09-17-90

METHOD ID: 602 UNITS: ug/L

WCC LAB ID: N	METHOD BLANK	900197-01-01 GW1	900197-02-01 GW2	•
JAMPLE ID LINE 2: DATE SAMPLED: DATE ANALYZED: 09 DETECTION LIMIT:	9-17-90 0.5	09-17-90 09-17-90 0.5	09-17-90 09-17-90 0.5	
BENZENE  OLUENE HLOROBENZENE ETHYLBENZENE 1,3-DICHLOROBENZENE ,2-DICHLOROBENZENE ,4-DICHLOROBENZENE	ND ND ND ND ND ND	0.7 5.4 ND 2.9 ND ND	8 110 ND 46 ND ND	

#### QUALITY ASSURANCE INFORMATION

AVG REC #1	AVG REC #2	AVG RPD
	• • • • • • • •	
82	85	4

ND - NOT DETECTED: SAMPLE CONTAINED THE PARAMETER BELOW THE PRACTICAL QUANTITATION LIMIT.

REVIEWED BY:

Willians

Woodward-Clyde Consultan 500 12th Street, Suite 100, Oakland, CA 94607-404 (415) 893-3600				ttants Chain of Custody Record									ly Record						
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		Signalura In Duy		<b>D</b> AM!	(A)ir			209	109	ETX	Metals				- Andread Andr		of Containers		REMARKS (Sample
DATE	TIME	SAN	MPLE NUMBE	R	Sample Matrix (S)oil, (W)ater, (A)ir	EPA Method	EPA Method	EPA Mathod	EPA Method 60	S/HAL	CAY17			de servicio de la constanta de la constanta de la constanta de la constanta de la constanta de la constanta de			Number of		preservation, handling procedures, etc.)
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# CHROMALAB, INC.

#### Analytical Laboratory Specializing in GC-GC/MS

Environmental Analysis

 Hazardous Waste (#E694)

Drinking Water

(#955)

Waste Water

Consultation

September 27, 1990

0990088 ChromaLab File No.:

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: George Ford

Re: Eight soil samples for Gasoline/BTEX analyses

Project Name:

Project Number: 90C0028A

Date Submitted: Sept. 20, 1990 Date Sampled: Sept. 19, 1990 Date Analyzed: Sept.21-27,1990 Date Extracted: Sept, 21-27,1990

#### RESULTS:

Sample No.	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (µg/Kg)	Total Xylenes (µg/Kg)
#1 #2 #3 #4 #5 #6 #7	N.D. 6.8 N.D. N.D. N.D. N.D. N.D.	N.D. 25 N.D. N.D. N.D. N.D. N.D.	N.D. 12 N.D. N.D. N.D. N.D. N.D.	N.D. N.D. N.D. N.D. N.D. N.D.	N.D. 67 N.D. N.D. N.D. N.D. N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY DUPLICATED SPIKE	96.4%	86.1%	92.5%	94.4%	93.5%
RECOVERY	91.1%	89.3%	89.7%	90.0%	107.6%
DETECTION LIMIT METHOD OF	2.5 5030/	5	5	5	5
ANALYSIS	8015	8020	8020	8020	8020

CHROMALAB, INC.

DAVIG Buong Senior Chemist Eric Tam

Laboratory Director

## CHROMALAB, INC.

Analytical Laboratory Specializing in GC-GC/MS Environmental Analysis

 Hazardous Waste (#E694)

 Drinking Water (#955)

Waste Water

Consultation

October 19, 1990

ChromaLab File No.:

1090100

WOODWARD-CLYDE CONSULTANTS, INC.

Attn: Bill Copeland

RE: Two soil samples for Gasoline/BTEX analysis

Project Number: 90C0028A

Date Sampled: Oct. 10, 1990 Date Submitted: Oct. 15, 1990 Oct. 16-18, 1990 Date Analyzed: Oct. 16-18,1990 Date Extracted:

#### RESULTS:

Sample No.	Gasoline (mg/Kg)	Benzene (µg/Kg)	Toluene (µg/Kg)	Ethyl Benzene (ug/Kg)	Total Xylenes (µg/Kg)
#9 #10	N.D. N.D.	N.D. N.D.	N.D. N.D.	N.D. N.D.	N.D.
BLANK SPIKED	N.D.	N.D.	N.D.	N.D.	N.D.
RECOVERY DETECTION	91.1%	89.3%	89.7%	90.0%	107.6%
LIMIT METHOD OF	2.5 5030/	5	5	.5	5
ANALYSIS	8015	8020	8020	8020	8020

CHROMALAB, INC.

David Duong

Senior Chemist

Eric Tam

Laboratory Director

Woodward-Clyde Consultants 500 12th Street, Suite 100, Oakland, CA 94607-4041 (415) 893-3600				Chain of Custody Record					
ROJECT NO. 90 C 00 28	A			ANAL	YSES	,			
AMPLERS: (Signature)	(A)ir	ס ס	P	P 1 7		CHROM	ALA:	B FI	LE # 990088
ATE TIME SAMPLE NUMB	Sample Matrix (S)oil, (W)ater	EPA Method EPA Method	EPA Method	EPA Metho	<b>&gt;</b>	***************************************		ž N	
9/9012:00 (1)				X				1	Normal
" 1 PM 3			<del> </del>	X				1	Normal turn - around
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" "BPM (6) " " 3:3041 (7)			$\frac{1}{1}$	-X				1 1	Call
",4PM 8								1	George Ford
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PROJE	CT NO.	Ci.		4	Γ	-		<del></del> -	ANA	LYS	ES								
SAMPL	ERS: (S	ignature)	oor8 1	_ 1				, and	905						Number of Containers		REMARI (Sample preservation	)	:
DATE	TIME	/	/ IPLE NUMBER	(W)	EPA Method	EPA Method	EPA Method	EPA Method	11H/	CETY		Automorphism			Number of		handling procedures,	<b>)</b> .	
10/10		<u> </u>	#9						X	X									
			4/0										NUMB	TOTAL SER OF LINERS		'	esults 3.6pc		
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NET Pacific, Inc. 435 Tesconi Circle Santa Rosa, CA 95401 Tel: (707) 526-7200 Fax: (707) 526-9623

George Ford Woodward-Clyde Cons. 500 12th Street, Suite 100 Oakland, CA 94607-4014 Date: 08-14-90 NET Client Acct No: 120

NET Client Acct No: 120 NET Pacific Log No: 3273A Received: 08-10-90 0800

Client Reference Information

Project: 90C0028A

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

Öules Skamarack Laboratory Manager

JS:rct Enclosure(s)

Date: 08-14-90

Page: 2

Ref: Project: 90C0028A

		<del></del>	C-1a 08-09-90	C-2a 08-09-90	
Parameter	Method	Reporting Limit	59948	59949	Units
Oil & Grease(Total) Oil & Grease(Non-Polar) Lead (EPA 7421)	9071 SM503D/E 7421	50 100 0.2	NO ND 2.2	76 ND 2.8	mg/Kg mg/Kg mg/Kg

Date: 08-14-90

Page: 3

Ref: Project: 90C0028A

Parameter		<del></del>	C-3a 08-09-90	C-4a 08-09-90	
	Method	Reporting Limit	59950	59951	Units
Oil & Grease(Total) Oil & Grease(Non-Polar) Lead (EPA 7421)	9071 SM503D/E 7421	50 100 0.2	ND ND 1.3	ND ND 1.8	mg/Kg mg/Kg mg/Kg

Date: 08-14-90

Page: 4

Ref: Project: 90C0028A

			C-6a 08-09-90	C-7a 08-09-90	
Parameter	Method	Reporting Limit	59952	59953	Units
Oil & Grease(Total) Oil & Grease(Non-Polar) Lead (EPA 7421)	9071 SM503D/E 7421	50 100 0.2	ND ND 1.5	ND ND 2.3	mg/Kg mg/Kg mg/Kg

Page: 5

Date: 08-14-90

Ref: Project: 90C0028A

		00	best ip to ; Eab No. and Resures				
		-	C-8a 08-09-90	C-9a 08-09- <b>90</b>	· · · · · · · · · · · · · · · · · · ·		
Parameter	Method	Reporting Limit	59954	59955	Units		
Oil & Grease(Total) Oil & Grease(Non-Polar)	9071 SM503D/E 7421	50 100 0.2	ND ND 1.7	ND ND 2.5	mg/Kg mg/Kg mg/Kg		

Date: 08-14-90

Page: 6

Ref: Project: 90C0028A

			C-10a 08-09-90	C-11a 08-09-90	
Parameter	Method	Reporting Limit	59956	59957	Units
Oil & Grease(Total) Oil & Grease(Non-Polar) Lead (EPA 7421)	9071 SM503D/E 7421	50 100 0.2	ND ND 2.6	ND ND 4.7	mg/Kg mg/Kg mg/Kg

Date: 08-14-90

Page: 7

Ref: Project: 90C0028A

Descriptor,	Lab	No.	and	Results
-------------	-----	-----	-----	---------

		De	bescriptor, cap no. and nesures			
		<del>-</del>	C-12a 08-09-90	C-17a 08-09-90		
Parameter	Method	Reporting Limit	59958	59959	Units	
Oil & Grease(Total) Oil & Grease(Non-Polar) Lead (EPA 7421)	9071 SM503D/E 7421	50 100 0.2	ND ND 2.4	ND ND 1.8	mg/Kg mg/Kg mg/Kg	

Date: 08-14-90

Page: 8

Ref: Project: 90C0028A

		_	C-18a 08-09-90	C-19a 08-09-90	
Parameter	Method	Reporting Limit	59960	59961	Units
Oil & Grease(Total) Oil & Grease(Non-Polar) Lead (EPA 7421)	9071 SM503D/E 7421	50 100 0.2	ND ND 1.8	ND ND 2.1	mg/Kg mg/Kg mg/Kg

Page: 9

Date: 08-14-90

Ref: Project: 90C0028A

		_	C-20a 08-09-90	C-1bc comp 08-09-90		
Parameter	Method	Reporting Limit	59962	59963	Units	
Oil & Grease(Total) Oil & Grease(Non-Polar) Lead (EPA 7421)	9071 SM503D/E 7421	50 100 0.2	ND ND 3.0	ND ND 1.7	mg/Kg mg/Kg mg/Kg	

Date: 08-14-90

Page: 10

Ref: Project: 90C0028A

Parameter		_	C-2bc comp 08-09-90	C-3bc comp 08-09-90	<del></del>	
	Method	Reporting Limit	59964	59965	Units	
Oil & Grease(Total) Oil & Grease(Non-Polar) Lead (EPA 7421)	9071 SM503D/E 7421	50 100 0.2	ND ND 2.0	ND ND 2.5	mg/Kg mg/Kg mg/Kg	

Date: 08-14-90

Page: 11

Ref: Project: 90C0028A

			C-4bc comp 08-09-90	C-6bc comp 08-09-90	<del></del>	
Parameter	Method	Reporting Limit	59966	59967	Units	
Oil & Grease(Total) Oil & Grease(Non-Polar) Lead (EPA 7421)	9071 SM503D/E 7421	50 100 0.2	ND ND 2.4	ND ND 1.8	mg/Kg mg/Kg mg/Kg	

Date: 08-14-90

Page: 12

Ref: Project: 90C0028A

			C-7bc comp 08-09-90	C-8bc comp 08-09-90	
Parameter	Method	Reporting Limit	59968	59969	Units
Oil & Grease(Total) Oil & Grease(Non-Polar) Lead (EPA 7421)	9071 SM503D/E 7421	50 100 0.2	ND ND 1.8	ND ND 1.4	mg/Kg mg/Kg mg/Kg

Date: 08-14-90

Page: 13

Ref: Project: 90C0028A

		<del></del>	C-9bc comp 08-09-90	C-10bc comp 08-09-90	
Parameter	Method	Reporting Limit	59970	59971	Units
Oil & Grease(Total) Oil & Grease(Non-Polar) Lead (EPA 7421)	9071 SM503D/E 7421	50 100 0.2	ND ND 1.9	ND ND 1.7	mg/Kg mg/Kg mg/Kg

Date: 08-14-90

Page: 14

Ref: Project: 90C0028A

		<del></del>	C-11bc comp 08-09-90	C-12bc comp 08-09- <b>90</b>	
Parameter	Method	Reporting Limit	59972	59973	Units
Oil & Grease(Total) Oil & Grease(Non-Polar) Lead (EPA 7421)	9071 SM503D/E 7421	50 100 0.2	ND ND 1.2	ND ND 1.2	mg/Kg mg/Kg mg/Kg

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			C-17bc comp 08-09-90	C-18bc comp 08-09-90		
Parameter	Method	Reporting Limit	59974	59975	Units	
Oil & Grease(Total) Oil & Grease(Non-Polar) Lead (EPA 7421)	9071 SM503D/E 7421	50 100 0.2	ND ND 1.3	50 ND 1.8	mg/Kg mg/Kg mg/Kg	

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			C-19bc comp 08-09-90	C-20bc comp 08-09-90		
Parameter	Method	Reporting Limit	59976	59977	Units	
Oil & Grease(Total) Oil & Grease(Non-Polar) Lead (FPA 7421)	9071 SM503D/E 7421	50 100 0.2	50 ND 1.6	ND ND 1.5	mg/Kg mg/Kg mg/Kg	

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#### QUALITY CONTROL DATA

Parameter	Reporting Limits	Units	Cal Verf Stand % Recovery	Blank Data	Spike % Recovery	Duplicate Spike % Recovery	RPD
Lead (EPA 7421)	0.2	mg/Kg	103	ND	103	102	<1
Oil & Grease(Total) Oil & Grease(Non-Polar)	50 100	mg/Kg mg/Kg	98 98	ND ND	98 N/A	99 N/A	<1 N/A



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George Ford Woodward-Clyde Cons. 500 12th Street, Suite 100 Oakland, CA 94607-4014 Date: 08-14-90

NET Client Acct No: 120 NET Pacific Log No: 3297 Received: 08-10-90 2300

Client Reference Information

Project: 90C0028A

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Approved by:

dules Skamarack Laboratory Manager

JS:rct
Enclosure(s)