

1993

93 SEP 16 PM 12:20

September 15, 1993
SCI 820.001

Mr. Brian Oliva
Alameda County Health Care Services Agency
Department of Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Quarterly Groundwater Monitoring
August 1993
6707 Bay Street
Emeryville, California

Dear Mr. Oliva:

This letter records the results of a groundwater monitoring event performed by Subsurface Consultants, Inc. (SCI) at the referenced site in August 1993.

Three underground tanks used to store methyl isobutyl ketone and possibly methyl ethyl ketone were removed from the site in October 1989 by others. Soil and groundwater adjacent to the previous tanks were shown, through studies by others, to have been impacted by past organic chemical releases. Soil vapor extraction and groundwater treatment systems were subsequently installed in 1990 to remediate contaminated soil and groundwater. The treatment systems were in operation till early 1991. Since 1991, no additional remediation has been performed. Treatment system and monitoring well locations are shown on the Attached Site Plan, Plate 1.

Initially, groundwater levels in the four wells were measured. The groundwater level measurements are presented in Table 1. Groundwater surface contours for the August 1993 event are shown on Plate 1.

For this event, Wells 1, 3 and 8 were sampled. Prior to sampling, these wells were purged with a clean disposable bailer until measurements of water pH, conductivity and temperature stabilized. A minimum of 4 well volumes were removed from each well. The purged water was placed in 55 gallon drums and left on-site.

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After the wells had recharged to within 80 percent of the initial volume they were sampled using a pre-cleaned sampling device. The water samples were retained in pre-cleaned containers, placed in an iced cooler, and kept refrigerated until delivery to the analytical laboratory. Chain-of-Custody documents accompanied the samples to the laboratory.

Analytical testing was performed by Curtis & Tompkins, Ltd., a California Department of Health Services certified analytical laboratory for the test performed. The samples were analytically tested for the following.

1. Volatile organic chemicals - EPA 8240, and
2. Oil & grease - SMWW 17:5520 E&F

A summary of the current and previous analytical test results are presented in Table 2. Analytical test reports and Chain-of-Custody documents are attached.

Conclusions

The groundwater level data indicate that groundwater flow direction is toward the northwest at a gradient of approximately 2 percent. This flow direction and gradient remain consistent with previous measurements.

Methyl isobutyl ketone, MIBK (4-methyl-2 pentanone) was detected in Well 8 at a concentration of 48,000 ug/l. No other volatile organic chemicals (EPA 8240) nor oil and grease were detected at concentrations in excess of the analytical detection limits in the wells being monitored. For this reason, it appears that the MIBK contaminant plume is limited to an area immediately adjacent to the previous tanks.

■ Subsurface Consultants, Inc.

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If you have any questions, please call.

Yours very truly,

Subsurface Consultants, Inc.



R. William Rudolph
Geotechnical Engineer 741 (expires 12/31/96)

MK:RWR:sld

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

**Table 1.
Groundwater Elevation Data**

Well	Date	TOC Elevation (feet)	Depth to Groundwater (feet)	Groundwater Elevation (feet)
MW-1	05/20/93	99.99	10.25	89.74
	06/04/93		11.45	88.54
	08/25/93		11.20	88.79
MW-3	05/20/93	99.46	8.55	90.91
	06/04/93		9.36	90.10
	08/25/93		9.42	90.04
MW-7	06/04/93	99.74	12.67	87.07
	08/25/93		12.44	87.30
MW-8	05/20/93	100.10	9.55	90.55
	06/04/93		10.81	89.29
	08/25/93		10.93	89.17

¹ Elevation reference: Building corner is assumed to be at elevation 100.00 feet

Table 2.
Contaminant Concentrations in Groundwater

Well	Date	Oil & Grease (mg/l) ¹	4-Methyl-2 Pentanone (ug/l) ²	Vinyl Chloride (ug/l)	Acetone (ug/l)	2-Butanone (ug/l)	4-Methyl-2 Pentanol (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Bis (2-Ethyl Hexyl) Phthalate (ug/l)	Other Organic Chemicals (ug/l)
MW1	07/06/89	-- ³	NR ⁴	<0.3	NR	NR	NR	<0.3	<0.3	-- ⁴	ND ⁵
	09/07/89	<10	<20	<4	<20	<20	NR	<2	<2	40	ND
	01/10/90	--	NR	<30	NR	NR	NR	<5	<5	<100	ND
	09/07/91	--	<10	<10	<20	<20	NR	7	8	--	ND
	05/20/93	<5	<10	<10	<20	<10	NR	<5	<5	--	ND
	08/25/93	<5	<10	<10	<20	<10	NR	<5	<5	--	ND
MW3	09/07/89	<10	<20	<4	<20	<20	NR	<2	<2	80	ND
	01/10/90	--	NR	<30	NR	NR	NR	<5	<5	<100	ND
	09/07/91	--	<10	<10	<20	<20	NR	<5	<5	--	ND
	05/20/93	<5	<10	<10	<20	<10	NR	<5	<5	--	ND
	08/25/93	<5	<10	<10	<20	<10	NR	<5	<5	--	ND
MW8	01/10/90	--	160,000	<6,000	NR	NR	NR	2,100	<1,000	<100	ND
	12/10/90	--	47,000 ⁶	<150	3,200 ⁶	10,000 ⁶	130,000 ⁶	160	<25	--	ND
	09/05/91	--	150,000	<10,000	<5,000	<20,000	NR	<10,000	<10,000	--	ND
	05/20/93	<5	100,000	<5,000	<10,000	<5,000	NR	<3,000	<3,000	--	ND
	08/25/93	<5	48,000	<3,000	<5,000	<3,000	NR	<1,000	<100	--	ND

¹ Milligrams per liter

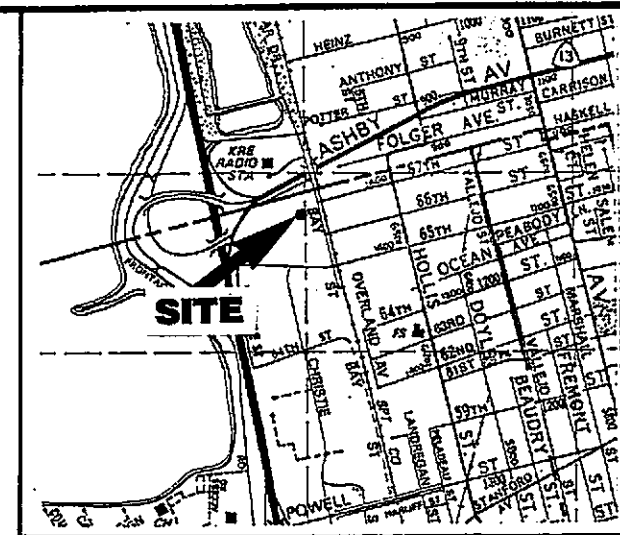
² Micrograms per liter

³ Test not requested

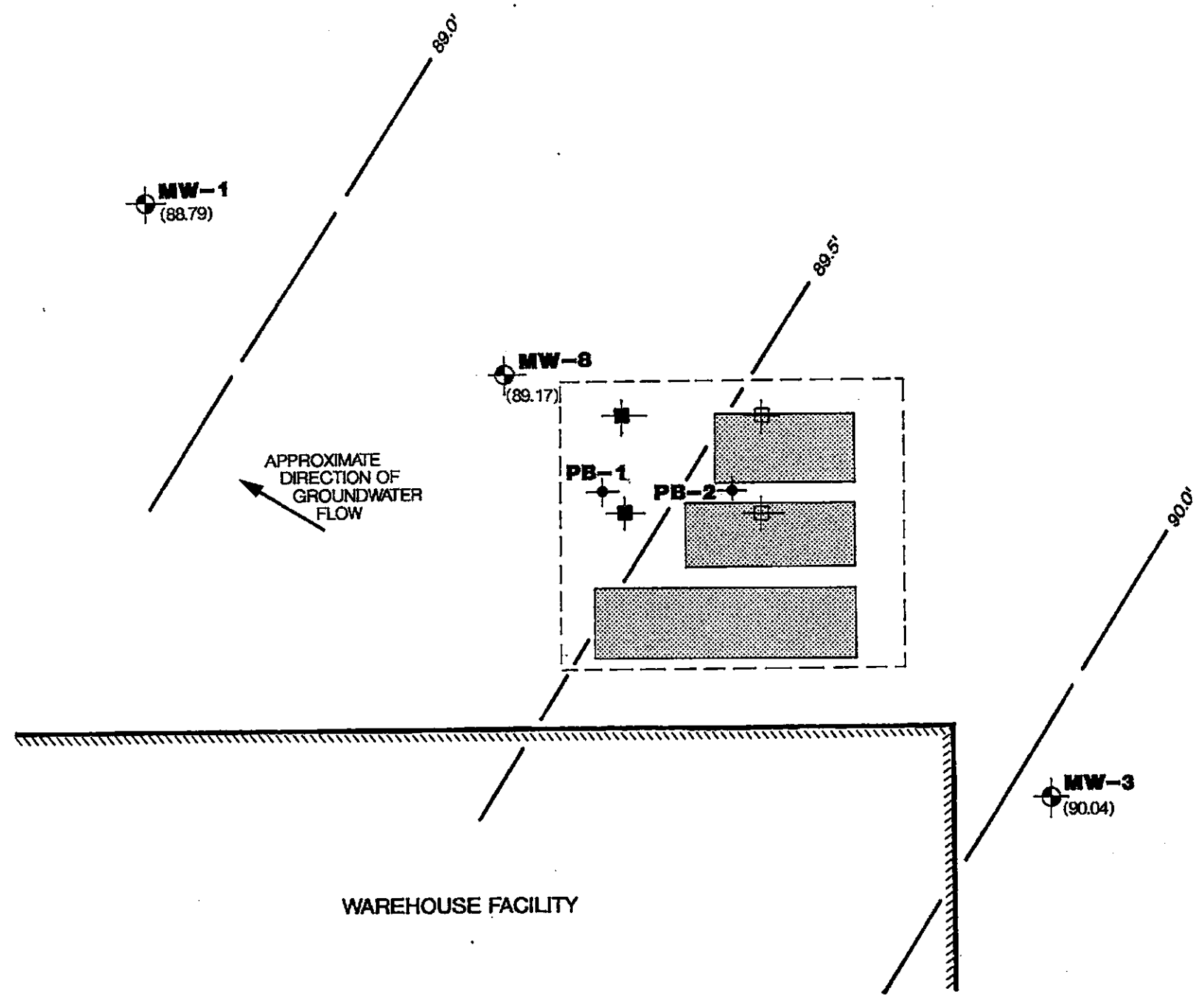
⁴ Not reported

⁵ Not detected above reporting limits

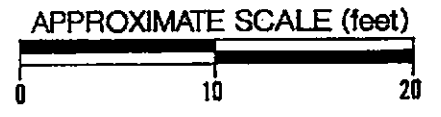
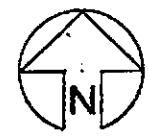
⁶ Tentatively identified compound concentrations



VICINITY MAP



- MONITORING WELL
- TEST BORING
- VAPOR EXTRACTION WELL
- PASSIVE VAPOR RECHARGE WELL
- APPROXIMATE LOCATION OF PREVIOUS UNDERGROUND STORAGE TANK
- APPROXIMATE EXTENT OF TANK EXCAVATION
- PROPERTY LINE
- GROUNDWATER CONTOURS (feet)
- (90.04) GROUNDWATER ELEVATION (feet)



SITE PLAN		
6707 BAY STREET - EMERYVILLE, CA		
JOB NUMBER	DATE	APPROVED
820.001	9/10/93	1

Subsurface Consultants



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

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

A N A L Y T I C A L R E P O R T

Prepared for:

Subsurface Consultants
171 12th Street
Suite 201
Oakland, CA 94608

Date: 01-SEP-93
Lab Job Number: 112021
Project ID: 820.001
Location: 6707 Bay St.



Reviewed by:

Reviewed by:

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Client: Subsurface Consultants

Laboratory Login Number: 112021

Project Name: 6707 Bay St.

Report Date: 01 September 93

Project Number: 820.001

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)

METHOD: SMWW 17:5520BF

Lab ID	Sample ID	Matrix	Sampled	Received	Analyzed	Result	Units	RL	Analyst	QC Batch
112021-001	MW-1	Water	25-AUG-93	25-AUG-93	31-AUG-93	ND	mg/L	5	TR	10374
112021-002	MW-3	Water	25-AUG-93	25-AUG-93	31-AUG-93	ND	mg/L	5	TR	10374
112021-003	MW-8	Water	25-AUG-93	25-AUG-93	31-AUG-93	ND	mg/L	5	TR	10374

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

Q C B a t c h R e p o r t

Client: Subsurface Consultants
 Project Name: 6707 Bay St.
 Project Number: 820.001

Laboratory Login Number: 112021
 Report Date: 01 September 93

ANALYSIS: Hydrocarbon Oil & Grease (Gravimetric)

QC Batch Number: 10374

Blank Results

Sample ID	Result	MDL	Units	Method	Date Analyzed
BLANK	ND	5	mg/L	SMWW 17:5520BF	31-AUG-93

Spike/Duplicate Results

Sample ID	Recovery	Method	Date Analyzed
BS	84%	SMWW 17:5520BF	31-AUG-93
BSD	82%	SMWW 17:5520BF	31-AUG-93

		Control Limits
Average Spike Recovery	83%	80% - 120%
Relative Percent Difference	3.2%	< 20%



LABORATORY NUMBER: 112021-1
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 820.001
LOCATION: 6707 BAY STREET
SAMPLE ID: MW-1

DATE SAMPLED: 08/25/93
DATE RECEIVED: 08/25/93
DATE ANALYZED: 08/27/93
DATE REPORTED: 09/01/93

EPA METHOD 8240: VOLATILE ORGANICS IN WATER

COMPOUND	Result ug/L	Reporting Limit (ug/L)
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl chloride	ND	10
Chloroethane	ND	10
Methylene chloride	ND	20
Acetone	ND	20
Carbon disulfide	ND	5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
cis-1,2-Dichloroethene	ND	5
trans-1,2-Dichloroethene	ND	5
Chloroform	ND	5
Freon 113	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	10
1,1,1-Trichloroethane	ND	5
Carbon tetrachloride	ND	5
Vinyl acetate	ND	10
Bromodichloromethane	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
Trichloroethene	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
2-Hexanone	ND	10
4-Methyl-2-pentanone	ND	10
1,1,2,2-Tetrachloroethane	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethyl benzene	ND	5
Styrene	ND	5
Total xylenes	ND	5

ND = Not detected at or above reporting limit

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	107 %
Toluene-d8	106 %
Bromofluorobenzene	100 %



LABORATORY NUMBER: 112021-2
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 820.001
LOCATION: 6707 BAY STREET
SAMPLE ID: MW-3

DATE SAMPLED: 08/25/93
DATE RECEIVED: 08/25/93
DATE ANALYZED: 08/27/93
DATE REPORTED: 09/01/93

EPA METHOD 8240: VOLATILE ORGANICS IN WATER

COMPOUND	Result ug/L	Reporting Limit (ug/L)
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl chloride	ND	10
Chloroethane	ND	10
Methylene chloride	ND	20
Acetone	ND	20
Carbon disulfide	ND	5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
cis-1,2-Dichloroethene	ND	5
trans-1,2-Dichloroethene	ND	5
Chloroform	ND	5
Freon 113	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	10
1,1,1-Trichloroethane	ND	5
Carbon tetrachloride	ND	5
Vinyl acetate	ND	10
Bromodichloromethane	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
Trichloroethene	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
2-Hexanone	ND	10
4-Methyl-2-pentanone	ND	10
1,1,2,2-Tetrachloroethane	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethyl benzene	ND	5
Styrene	ND	5
Total xylenes	ND	5

ND = Not detected at or above reporting limit

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	111 %
Toluene-d8	104 %
Bromofluorobenzene	102 %



LABORATORY NUMBER: 112021-3
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 820.001
LOCATION: 6707 BAY STREET
SAMPLE ID: MW-8

DATE SAMPLED: 08/25/93
DATE RECEIVED: 08/25/93
DATE ANALYZED: 08/30/93
DATE REPORTED: 09/01/93

EPA METHOD 8240: VOLATILE ORGANICS IN WATER

COMPOUND	Result ug/L	Reporting Limit (ug/L)
Chloromethane	ND	3,000
Bromomethane	ND	3,000
Vinyl chloride	ND	3,000
Chloroethane	ND	3,000
Methylene chloride	ND	5,000
Acetone	ND	5,000
Carbon disulfide	ND	1,000
Trichlorofluoromethane	ND	1,000
1,1-Dichloroethene	ND	1,000
1,1-Dichloroethane	ND	1,000
cis-1,2-Dichloroethene	ND	1,000
trans-1,2-Dichloroethene	ND	1,000
Chloroform	ND	1,000
Freon 113	ND	1,000
1,2-Dichloroethane	ND	1,000
2-Butanone	ND	3,000
1,1,1-Trichloroethane	ND	1,000
Carbon tetrachloride	ND	1,000
Vinyl acetate	ND	3,000
Bromodichloromethane	ND	1,000
1,2-Dichloropropane	ND	1,000
cis-1,3-Dichloropropene	ND	1,000
Trichloroethene	ND	1,000
Dibromochloromethane	ND	1,000
1,1,2-Trichloroethane	ND	1,000
Benzene	ND	1,000
trans-1,3-Dichloropropene	ND	1,000
Bromoform	ND	1,000
2-Hexanone	ND	3,000
4-Methyl-2-pentanone	48,000	3,000
1,1,2,2-Tetrachloroethane	ND	1,000
Tetrachloroethene	ND	1,000
Toluene	ND	1,000
Chlorobenzene	ND	1,000
Ethyl benzene	ND	1,000
Styrene	ND	1,000
Total xylenes	ND	1,000

ND = Not detected at or above reporting limit
QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	101 %
Toluene-d8	96 %
Bromofluorobenzene	95 %



LABORATORY NUMBER: 112021-METHOD BLANK
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 820.001
LOCATION: 6707 BAY STREET

DATE ANALYZED: 08/27/93
DATE REPORTED: 09/01/93

EPA METHOD 8240: VOLATILE ORGANICS IN WATER

COMPOUND	Result ug/L	Reporting Limit (ug/L)
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl chloride	ND	10
Chloroethane	ND	10
Methylene chloride	ND	20
Acetone	ND	20
Carbon disulfide	ND	5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
cis-1,2-Dichloroethene	ND	5
trans-1,2-Dichloroethene	ND	5
Chloroform	ND	5
Freon 113	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	10
1,1,1-Trichloroethane	6	5
Carbon tetrachloride	ND	5
Vinyl acetate	ND	10
Bromodichloromethane	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
Trichloroethene	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
2-Hexanone	ND	10
4-Methyl-2-pentanone	ND	10
1,1,2,2-Tetrachloroethane	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethyl benzene	ND	5
Styrene	ND	5
Total xylenes	ND	5

ND = Not detected at or above reporting limit

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	111 %
Toluene-d8	104 %
Bromofluorobenzene	98 %



LABORATORY NUMBER: 112021-METHOD BLANK
CLIENT: SUBSURFACE CONSULTANTS
PROJECT ID: 820.001
LOCATION: 6707 BAY STREET

DATE ANALYZED: 08/30/93
DATE REPORTED: 09/01/93

EPA METHOD 8240: VOLATILE ORGANICS IN WATER

COMPOUND	Result ug/L	Reporting Limit (ug/L)
Chloromethane	ND	10
Bromomethane	ND	10
Vinyl chloride	ND	10
Chloroethane	ND	10
Methylene chloride	ND	20
Acetone	ND	20
Carbon disulfide	ND	5
Trichlorofluoromethane	ND	5
1,1-Dichloroethene	ND	5
1,1-Dichloroethane	ND	5
cis-1,2-Dichloroethene	ND	5
trans-1,2-Dichloroethene	ND	5
Chloroform	ND	5
Freon 113	ND	5
1,2-Dichloroethane	ND	5
2-Butanone	ND	10
1,1,1-Trichloroethane	ND	5
Carbon tetrachloride	ND	5
Vinyl acetate	ND	10
Bromodichloromethane	ND	5
1,2-Dichloropropane	ND	5
cis-1,3-Dichloropropene	ND	5
Trichloroethene	ND	5
Dibromochloromethane	ND	5
1,1,2-Trichloroethane	ND	5
Benzene	ND	5
trans-1,3-Dichloropropene	ND	5
Bromoform	ND	5
2-Hexanone	ND	10
4-Methyl-2-pentanone	ND	10
1,1,2,2-Tetrachloroethane	ND	5
Tetrachloroethene	ND	5
Toluene	ND	5
Chlorobenzene	ND	5
Ethyl benzene	ND	5
Styrene	ND	5
Total xylenes	ND	5

ND = Not detected at or above reporting limit

QA/QC SUMMARY: SURROGATE RECOVERIES

1,2-Dichloroethane-d4	100 %
Toluene-d8	93 %
Bromofluorobenzene	100 %

QC SUMMARY SHEET FOR EPA 8240

Laboratory Number: 112021
 Client: Subsurface Consultants Spike file: brh18
 Analysis date: 08/28/93 Spike dup file: brh19
 Sample type: Water

SPIKE DATA (spiked at 50 ppb)

SPIKE COMPOUNDS	READING	RECOVERY	STATUS	LIMITS
1,1-Dichloroethene	48.88	98 %	OK	61 - 145
Trichloroethene	49.38	99 %	OK	71 - 120
Benzene	47.96	96 %	OK	76 - 127
Toluene	42.81	86 %	OK	76 - 125
Chlorobenzene	47.11	94 %	OK	75 - 130
SURROGATES				
1,2-Dichloroethane-d4	51.37	103 %	OK	76 - 114
Toluene-d8	49.61	99 %	OK	88 - 110
Bromofluorobenzene	48.95	98 %	OK	86 - 115
	48.41			

SPIKE DUP DATA (spiked at 50 ppb)

SPIKE COMPOUNDS	READING	RECOVERY	STATUS	LIMITS
1,1-Dichloroethene	50.98	102 %	OK	61 - 145
Trichloroethene	47.62	95 %	OK	71 - 120
Benzene	45.85	92 %	OK	76 - 127
Toluene	42.65	85 %	OK	76 - 125
Chlorobenzene	47.24	94 %	OK	75 - 130
SURROGATES				
1,2-Dichloroethane-d4	49.49	99 %	OK	76 - 114
Toluene-d8	49.08	98 %	OK	88 - 110
Bromofluorobenzene	48.77	98 %	OK	86 - 115

MATRIX RESULTS

1,1-Dichloroethene	0
Trichloroethene	0
Benzene	0
Toluene	0
Chlorobenzene	0

RPD DATA

SPIKE COMPOUNDS	SPIKE	SPIKE DUP	RPD	STATUS	LIMITS
1,1-Dichloroethene	48.88	50.98	4 %	OK	< 14
Trichloroethene	49.38	47.62	4 %	OK	< 14
Benzene	47.96	45.85	4 %	OK	< 11
Toluene	42.81	42.65	0 %	OK	< 13
Chlorobenzene	47.11	47.24	0 %	OK	< 13



QC SUMMARY SHEET FOR EPA 8240

Laboratory Number: 112021
 Client: Subsurface Consultants Spike file: chu08
 Analysis date: 08/30/93 Spike dup file: chu09
 Sample type: Water

SPIKE DATA (spiked at 50 ppb)

SPIKE COMPOUNDS	READING	RECOVERY	STATUS	LIMITS
1,1-Dichloroethene	47.04	94 %	OK	61 - 145
Trichloroethene	50.75	102 %	OK	71 - 120
Benzene	239.67	83 %	OK	76 - 127
Toluene	46.45	91 %	OK	76 - 125
Chlorobenzene	51.47	103 %	OK	75 - 130
SURROGATES				
1,2-Dichloroethane-d4	51.37	103 %	OK	76 - 114
Toluene-d8	48.84	98 %	OK	88 - 110
Bromofluorobenzene	47.68	95 %	OK	86 - 115

SPIKE DUP DATA (spiked at 50 ppb)

SPIKE COMPOUNDS	READING	RECOVERY	STATUS	LIMITS
1,1-Dichloroethene	49.11	98 %	OK	61 - 145
Trichloroethene	53.36	107 %	OK	71 - 120
Benzene	243.71	91 %	OK	76 - 127
Toluene	47.86	93 %	OK	76 - 125
Chlorobenzene	53.57	107 %	OK	75 - 130
SURROGATES				
1,2-Dichloroethane-d4	51.00	102 %	OK	76 - 114
Toluene-d8	48.46	97 %	OK	88 - 110
Bromofluorobenzene	46.63	93 %	OK	86 - 115

MATRIX RESULTS

1,1-Dichloroethene	0
Trichloroethene	0
Benzene	198.39
Toluene	1.14
Chlorobenzene	0

RPD DATA

SPIKE COMPOUNDS	SPIKE	SPIKE DUP	RPD	STATUS	LIMITS
1,1-Dichloroethene	47.04	49.11	4 %	OK	< 14
Trichloroethene	50.75	53.36	5 %	OK	< 14
Benzene	239.67	243.71	2 %	OK	< 11
Toluene	46.45	47.86	3 %	OK	< 13
Chlorobenzene	51.47	53.57	4 %	OK	< 13

