91 APR -3 PM 4:09

REPORT

Project # 2010-001

QUARTERLY GROUNDWATER

MONITORING

5800 Christie Avenue
Emeryville, California

Submitted to:

Mr. Dennis Byrne
Alameda County Health Care Services
Hazardous Materials Division

80 Swan Way, Room 200
Oakland, CA 94621

Prepared For:

Croley & Herring Investment Company

1311 63rd Street
Emeryville, CA 94608

March 21, 1991

49 Stevenson Street, Suite 600,
San Francisco, CA 94105
Telephone: (415) 227-0822 FAX: (415) 227-0842

AWD
TECHNOLOGIES

March 21, 1991

Mr. Dick Herring
Croley and Herring Investment Company
1311 63rd Street
Emeryville, CA 94608

Dear Mr. Herring,

Subject: **Quarterly Report for Groundwater Monitoring**
5800 Christie Avenue, Emeryville, California

Enclosed please find a copy of the quarterly status report regarding the results of groundwater sampling performed in December, 1990 at the subject facility.

Should you have any questions regarding the subject report, please contact me.

Sincerely yours,

for Walter Loo

Walter Loo
Director of Remediation

WWL/isw

Enclosure

AWD Technologies, Inc. 49 Stevenson Street Suite 600 San Francisco California 94105 Telephone 415 227 0822 Telecopier 415 227 0842

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1.0 INTRODUCTION

AWD Technologies, Inc. (AWD) was retained by Croley and Herring Investment Company (CHIC) to perform the fifth quarterly groundwater monitoring for a facility located at 5800 Christie Street in Emeryville, California. The subject facility is currently leased to an electronic merchandise retailer. Prior to leasing, soil contamination was identified at the subject facility. The contaminated soil was removed with the exception of those underlying a building because of safety concern. The removed soil was remediated onsite and properly disposed of with the approval of the regulatory agencies.

There is a vapor extraction system installed immediately adjacent to the northeastern side of the building to mitigate the residual volatile hydrocarbons contained in the soil. As part of the site closure plan, a quarterly groundwater monitoring program is currently implemented. Three previous quarterly monitoring events were performed on November 6, 1989, February 20, 1990, May 31, 1990, and September 7, 1990, respectively. The fifth quarterly monitoring activities was conducted on December 4, 1990. Water samples were taken from the monitoring wells and sent to a State-certified laboratory for analysis under proper chain-of-custody procedures.

This report presents the results of the fifth quarterly groundwater monitoring activities including groundwater movement analysis, laboratory analytical results, summary of findings, and conclusions and discussions.

2.0 GROUNDWATER MOVEMENT ANALYSIS

Prior to sample collection of this quarterly sampling, depth to water table in each of the three existing monitoring wells at the facility was measured for the analysis of groundwater movement. Table 1 presents a summary of the water levels in the three wells (EW-1, MW-2, and MW-3) from the four rounds of sampling events.

From the result of the water level measurements on December 4, 1990, elevation of water levels were slightly decreased in EW-1 and MW-2 but slightly increased in MW-3, as compared to the data collected in September 1990. Nevertheless, the groundwater flow direction remained in the same direction, flowing toward south (Figure 1). The hydraulic gradient was 0.045 feet per horizontal foot.

TABLE 1

SUMMARY OF WATER LEVEL DATA

WELL ID	Elev. of TOC (Ft-MSL)	11/6/89 DTW Ft	11/6/89 SWL Ft	2/20/90 DTW Ft	2/20/90 SWL Ft	5/31/90 DTW Ft	5/31/90 SWL Ft	9/7/90 DTW Ft	9/7/90 SWL Ft	12/4/90 DTW Ft	12/4/90 SWL Ft
EW-1	8.62	6.15	2.47	5.93	2.69	5.86	2.76	6.30	2.32	7.39	2.23
MW-2	7.42	4.37	3.05	4.26	3.16	4.26	3.16	4.60	2.82	4.67	2.75
MW-3	6.42	5.10	1.32	5.42	1.00	4.93	1.49	5.15	1.17	5.96	1.35

Note:

TOC is top of casing
DTW is depth to water table
SWL is static water level above MSL
MSL is mean sea level

On December 4, 1990, AWD field personnel visited the facility and collected water samples from each of the three monitoring wells for analysis. These groundwater samples were sent to a State-certified laboratory for analyses of halocarbons using EPA method 601, total petroleum hydrocarbons (TPH) as gasoline and gasoline constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA method 602. During water sampling, field parameters as water temperature, electric conductivity, and pH were measured and recorded.

From the results of the laboratory analysis (Appendix A), none of the water samples collected from Wells MW-2 and MW-3 contain detectable concentration of the above analytes on this sampling event. However, water sample taken from Well EW-1 contained some volatile organic compounds having concentration lower than those which were detected in the fourth quarterly monitoring event. The compounds detected in Well EW-1 from the December 4, 1990 sampling episode are listed as following:

TPH	7,400 ppb
Benzene	180 ppb
Toluene	3,500 ppb
Ethylbenzene	<90 ppb
Xylenes	<200 ppb
1,1 DCE	<30 ppb
1,2 DCE	1,500 ppb
1,1 DCA	460 ppb
1,2 DCA	<30
1,1,1 TCA	72 ppb
1,1,2 TCA	<100 ppb
TCE	1,500 ppb
Chloroethane	1000 ppb
Methylene Chloride	<400 ppb
Vinyl Chloride	<230 ppb
Temperature	68°F
EC	14.75 millimhos/cm
pH	6.8

4.0 SUMMARY OF FINDINGS

Groundwater movement across the facility remains in a similar pattern, as compared to the result from the previous sampling event. Data of flow direction and hydraulic gradient are summarized as following:

Date of Sampling	4/25/89	11/6/89	2/20/90	5/31/90	9/7/90	12/4/90
Flow Direction	Southwest	South	South	South	South	South
Hydraulic gradient	0.00145	0.012	0.016	0.0125	0.0115	0.045

None of the water samples collected from Wells MW-2 and MW-3 contained hydrocarbons at concentration above detection limits. However, analytical results of groundwater in Well EW-1 indicated thatTPH concentration reduced from 25,000 ppb to less than 6,000 ppb (detection limit) while benzene concentration reduced from 1,100 ppb to less than 60 ppb (detection limit). 1,1DCE concentration reduced from 2,400 ppb to 400 ppb while vinyl chloride concentration reduced from 1,700 ppb to less than 400 ppb (detection limit). The relatively high detection limits of the testing methods were caused by the matrix interference, according to laboratory personnel. The trend of water quality in Well EW-1 is shown on Table 2.

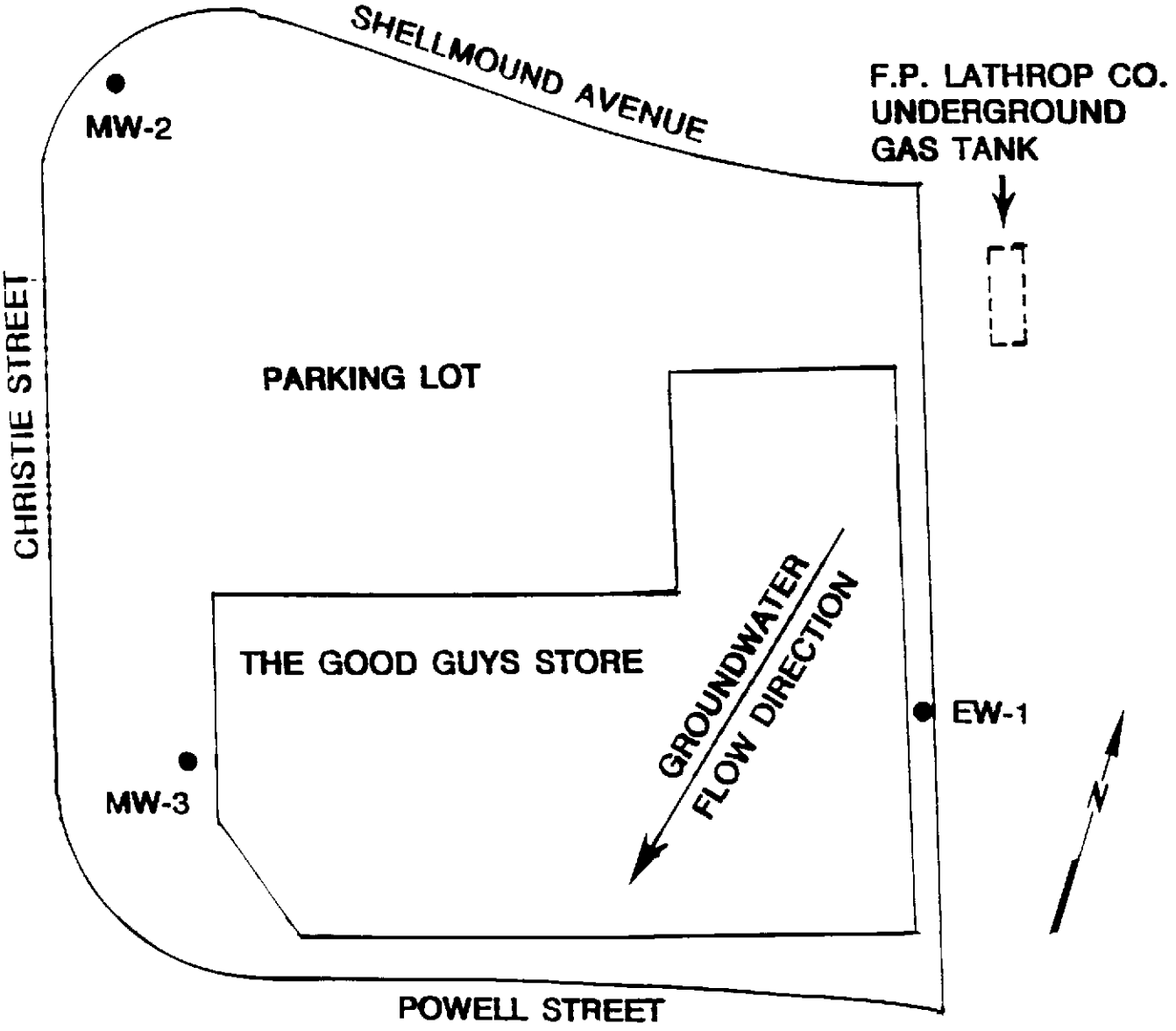
There are several major factors that affect the changes in the hydrocarbons concentration. These factors are soil desorption due to variation of water table, chemical breakdown due to natural degradation, and unidentified sources. It is AWD's opinion that changes of halocarbons concentrations are caused by the combination of soil desorption and the natural degradation process. The presence of gasoline constituents is likely caused by a suspect upgradient source. AWD will recommend to Alameda County Health Services that potential responsible party/parties (PRP) for the gasoline contamination at this facility be identified. Once the PRP is identified, AWD will then recommend that a groundwater extraction system be implemented in the source area to reverse the groundwater movement and remediate the gasoline plume.

TABLE 2

SUMMARY OF QUARTERLY MONITORING RESULTS OF HAZARDOUS ORGANIC COMPOUNDS

	CONCENTRATIONS IN PPB					
COMPOUNDS	5/8/89	11/6/89	2/20/90	5/31/90	9/7/90	12/4/90
TPH as Gasoline	NT	740	12,000	24,000	25,000	7,400
Benzene	ND	180	1,300	56	1,100	180
Toluene	190	39	3,600	6,100	800	3,500
Xylenes	170	67	47	140	42	<200
Ethylbenzene	ND	0.8	7.1	17	<25	<90
TCE	640	740	1,100	830	490	1,500
1,1 DCE	78	2.3	14	69	36	<30
1,2 DCE	ND	350	2,500	110	2,400	1,500
1,1,1 TCA	ND	26	550	1,200	510	72
1,1 DCA	ND	34	460	1,900	1,300	460
1,2 DCA	ND	4.8	34	33	53	<30
Vinyl Chloride	ND	29	ND	2,600	1,700	230
Chloroethane	ND	ND	29	94	150	<30
Methylene Chloride	ND	ND	14	40	22	<400

ND: Not Detected



LEGEND

● MONITORING WELL LOCATION

0 40 80
scale feet

GROUNDWATER MOVEMENT
DIRECTION (12/4/90)

AWD TECHNOLOGIES, INC

AWD TECHNOLOGIES

SITE LOCATION MAP
5800 CHRISTIE STREET
EMERYVILLE, CALIFORNIA

CUSTOMER: CHIC JOB NUMBER: 630-1000

DATE: DRAWING NUMBER: FIGURE 1 REV 0

APPENDIX A

GROUNDWATER ANALYSIS REESULTS

SEQUOIA ANALYTICAL
680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

AWD Technologies, Inc.	Client Project ID:	Chic / Emeryville	Sampled: Dec 4, 1990
49 Stevenson Street, Suite 600	Matrix Descript:	Water	Received: Dec 4, 1990
San Francisco, CA 94105	Analysis Method:	EPA 5030/8015/8020	Analyzed: Dec 13, 1990
Attention: I-Sen Wang, R.E.A.	First Sample #:	012-0308 A	Reported: Dec 17, 1990

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
012-0308	EW-1	N.D.	N.D.	1,700	N.D.	N.D.
Detection Limits:		**6,000**	**60**	**60**	**60**	**60**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

SEQUOIA ANALYTICAL

Malie A. McBirney
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

AWD Technologies, Inc.	Client Project ID:	Chic / Emeryville	Sampled: Dec 4, 1990
49 Stevenson Street, Suite 600	Matrix Descript:	Water	Received: Dec 4, 1990
San Francisco, CA 94105	Analysis Method:	EPA 5030/8015/8020	Analyzed: Dec 13, 1990
Attention: I-Sen Wang, R.E.A.	First Sample #:	012-0309 A	Reported: Dec 17, 1990

TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons µg/L (ppb)	Benzene µg/L (ppb)	Toluene µg/L (ppb)	Ethyl Benzene µg/L (ppb)	Xylenes µg/L (ppb)
012-0309	MW-2	N.D.	N.D.	N.D.	N.D.	N.D.
012-0310	MW-3	N.D.	N.D.	N.D.	N.D.	N.D.
Detection Limits:		**30**	**0.30**	**0.30**	**0.30**	**0.30**

Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Maile A. McBirney
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

AWD Technologies, Inc.	Client Project ID:	Chic / Emeryville	Sampled: Dec 4, 1990
49 Stevenson Street, Suite 600	Sample Descript:	Wastewater, EW-1	Received: Dec 4, 1990
San Francisco, CA 94105	Analysis Method:	EPA 601	
Attention: I-Sen Wang, R.E.A.	Lab Number:	012-0308 B	Analyzed: Dec 12, 1990
			Reported: Dec 18, 1990

PURGEABLE HALOCARBONS (EPA 601)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	200	N.D.
Bromoform	200	N.D.
Bromomethane	200	N.D.
Carbon tetrachloride	200	N.D.
Chlorobenzene	200	N.D.
Chloroethane	1,000	N.D.
2-Chloroethylvinyl ether	200	N.D.
Chloroform	100	N.D.
Chloromethane	100	N.D.
Dibromochloromethane	100	N.D.
1,2-Dichlorobenzene	400	N.D.
1,3-Dichlorobenzene	400	N.D.
1,4-Dichlorobenzene	400	N.D.
Dichlorodifluoromethane	400	N.D.
1,1-Dichloroethane	**100**	**1,300**
1,2-Dichloroethane	100	N.D.
1,1-Dichloroethene	100	N.D.
Total 1,2-Dichloroethene	**200**	**400**
1,2-Dichloropropane	100	N.D.
cis-1,3-Dichloropropene	1,000	N.D.
trans-1,3-Dichloropropene	1,000	N.D.
Methylene chloride	400	N.D.
1,1,2,2-Tetrachloroethane	100	N.D.
Tetrachloroethene	100	N.D.
1,1,1-Trichloroethane	**100**	**250**
1,1,2-Trichloroethane	100	N.D.
Trichloroethene	**100**	**130**
Trichlorofluoromethane	200	N.D.
Vinyl chloride	400	N.D.

Analytes reported as N.D. were not present above the stated limit of detection. Because matrix effects and/or other factors required additional sample dilution, detection limits for this sample have been raised.

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Maile A. McBirney
Project Manager

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AWD Technologies, Inc.	Client Project ID:	Chic / Emeryville	Sampled: Dec 4, 1990
49 Stevenson Street, Suite 600	Sample Descript:	Wastewater, MW-2	Received: Dec 4, 1990
San Francisco, CA 94105	Analysis Method:	EPA 601	
Attention: I-Sen Wang, R.E.A.	Lab Number:	012-0309 B	Analyzed: Dec 12, 1990
			Reported: Dec 18, 1990

PURGEABLE HALOCARBONS (EPA 601)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	1.0	N.D.
Bromoform	1.0	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	1.0	N.D.
Chlorobenzene	1.0	N.D.
Chloroethane	5.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dichlorobenzene	2.0	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
Dichlorodifluoromethane	2.0	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
Total 1,2-Dichloroethene	1.0	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	2.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	1.0	N.D.
Vinyl chloride	2.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Maile A. McBirney
Project Manager

SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063
(415) 364-9600 • FAX (415) 364-9233

AWD Technologies, Inc.	Client Project ID:	Chic / Emeryville	Sampled: Dec 4, 1990
49 Stevenson Street, Suite 600	Sample Descript:	Wastewater, MW-3	Received: Dec 4, 1990
San Francisco, CA 94105	Analysis Method:	EPA 601	
Attention: I-Sen Wang, R.E.A.	Lab Number:	012-0310 B	Analyzed: Dec 12, 1990
			Reported: Dec 18, 1990

PURGEABLE HALOCARBONS (EPA 601)

Analyte	Detection Limit µg/L	Sample Results µg/L
Bromodichloromethane	1.0	N.D.
Bromoform	1.0	N.D.
Bromomethane	1.0	N.D.
Carbon tetrachloride	1.0	N.D.
Chlorobenzene	1.0	N.D.
Chloroethane	5.0	N.D.
2-Chloroethylvinyl ether	1.0	N.D.
Chloroform	0.50	N.D.
Chloromethane	0.50	N.D.
Dibromochloromethane	0.50	N.D.
1,2-Dichlorobenzene	2.0	N.D.
1,3-Dichlorobenzene	2.0	N.D.
1,4-Dichlorobenzene	2.0	N.D.
Dichlorodifluoromethane	2.0	N.D.
1,1-Dichloroethane	0.50	N.D.
1,2-Dichloroethane	0.50	N.D.
1,1-Dichloroethene	0.50	N.D.
Total 1,2-Dichloroethene	1.0	N.D.
1,2-Dichloropropane	0.50	N.D.
cis-1,3-Dichloropropene	5.0	N.D.
trans-1,3-Dichloropropene	5.0	N.D.
Methylene chloride	2.0	N.D.
1,1,2,2-Tetrachloroethane	0.50	N.D.
Tetrachloroethene	0.50	N.D.
1,1,1-Trichloroethane	0.50	N.D.
1,1,2-Trichloroethane	0.50	N.D.
Trichloroethene	0.50	N.D.
Trichlorofluoromethane	1.0	N.D.
Vinyl chloride	2.0	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Maile A. McBirney
Project Manager

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (415) 783-6960
Facsimile (415) 783-1512

TAL

LOG NO.: 9541
DATE SAMPLED: 1/21/91
DATE RECEIVED: 1/22/91
DATE ANALYZED: 1/26/91
DATE REPORTED: 2/05/91

CUSTOMER: AWD Technologies

REQUESTER: I-Sen Wang

PROJECT: No. 9107-008, ISE

		Sample Type: Water	
		ISE-1	
Method and Constituent	Units	Concentration	Reporting Limit
DHS Method:			
Total Petroleum Hydrocarbons as Gasoline	ug/l	7,400	7,000
Modified EPA Method 8020:			
Benzene	ug/l	180	80
Toluene	ug/l	3,500	90
Xylenes	ug/l	ND	200
Ethylbenzene	ug/l	ND	90

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NO.: 9541
DATE SAMPLED: 1/21/91
DATE RECEIVED: 1/22/91
DATE ANALYZED: 1/24/91
DATE REPORTED: 2/05/91
PAGE: Two

Sample Type: Water

Method and Constituent	Units	ISE-1 Concentration	ISE-1 Reporting Limit
EPA Method 8010:			
Benzyl Chloride	ug/l	ND	30
Bis (2-Chloroethoxy) Methane	ug/l	ND	30
Bis (2-Chloroisopropyl) Ether	ug/l	ND	30
Bromobenzene	ug/l	ND	30
Bromodichloromethane	ug/l	ND	30
Bromoform	ug/l	ND	30
Bromomethane	ug/l	ND	30
Carbon Tetrachloride	ug/l	ND	30
Chloracetaldehyde	ug/l	ND	30
Chloral	ug/l	ND	30
Chlorobenzene	ug/l	ND	30
Chloroethane	ug/l	ND	30
Chloroform	ug/l	ND	30
1-Chlorohexane	ug/l	ND	30
2-Chloroethyl Vinyl Ether	ug/l	ND	30
Chloromethane	ug/l	ND	30
Chloromethyl Methyl Ether	ug/l	ND	30
Chlorotoluene	ug/l	ND	30
Dibromochloromethane	ug/l	ND	30
Dibromomethane	ug/l	ND	30

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NO.: 9541
DATE SAMPLED: 1/21/91
DATE RECEIVED: 1/22/91
DATE ANALYZED: 1/29/91
DATE REPORTED: 2/05/91
PAGE: Three

Sample Type: Water

Method and Constituent	Units	ISE-1 Concentration	ISE-1 Reporting Limit
EPA Method 8010 (Continued):			
1,2-Dichlorobenzene	ug/l	ND	30
1,3-Dichlorobenzene	ug/l	ND	30
1,4-Dichlorobenzene	ug/l	ND	30
Dichlorodifluoromethane	ug/l	ND	30
1,1-Dichloroethane	ug/l	460	10
1,2-Dichloroethane	ug/l	ND	30
1,1-Dichloroethylene	ug/l	ND	30
Trans-1,2-Dichloroethylene	ug/l	1,500	10
Dichloromethane	ug/l	ND	700
1,2-Dichloropropane	ug/l	ND	30
1,3-Dichloropropylene	ug/l	ND	30
1,1,2,2-Tetrachloroethane	ug/l	ND	30
1,1,1,2-Tetrachloroethane	ug/l	ND	30
Tetrachloroethylene	ug/l	ND	30
1,1,1-Trichloroethane	ug/l	72	10
1,1,2-Trichloroethane	ug/l	ND	30
Trichloroethylene	ug/l	1,500	10
Trichlorofluoromethane	ug/l	ND	30
Trichloropropane	ug/l	ND	30
Vinyl Chloride	ug/l	230	20

Concentrations reported as ND were not detected at or above the reporting limit.

Louis W.DuPuis
Quality Assurance/Quality Control Manager

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (415) 783-6960
Facsimile (415) 783-1512

TAL

CHAIN OF CUSTODY RECORD

REF 9541

PROJ. NO.	PROJECT NAME
710-005	ISE

SAMPLERS: (Signature) [signature]

STA. NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	TPH(Gas) +BTEX (8010)	601					
ISE-1	1/22/91	1100 AM		✓	~~ISE~~ Emeryville	4 x 40 ml	X	X					

~~2 wks TAT~~ 10 day TAT
4-40ml/small bubble in each
Green
PP

1/22/91 called ISE to verify. Said wanted by 2/5/91 = 10 day TAT

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
[signature]	1/22/91 1450	[signature]	[signature] 1/24/91 1450		
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	