

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

448 Tharp Drive
Moraga, CA 94556

August 30, 1991

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

AWD Technologies, Inc.



A Subsidiary of
The Dow Chemical Company

August 30, 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 April, 1990 at the subject facility.

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

Sincerely yours,

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 Fax 415 227 0842

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HAZARDOUS ORGANIC COMPOUNDS

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.

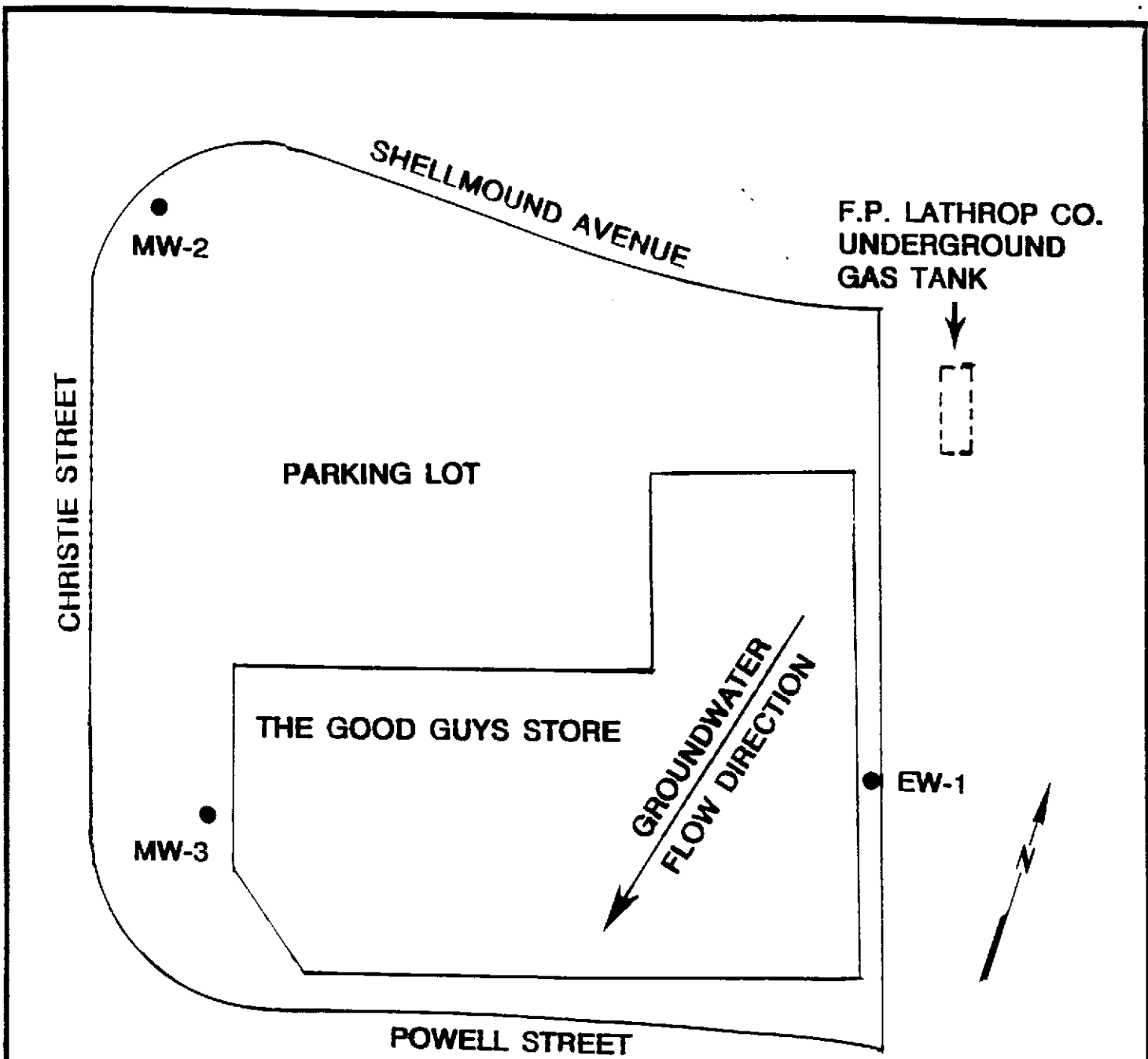
There is a vapor extraction system installed immediately adjacent to the northeastern side of the building to mitigate the residual volatile hydrocarbons contained in the soil. As part of the site closure plan, a quarterly groundwater monitoring program is currently implemented. Three previous quarterly monitoring events were performed on November 6, 1989, February 20, 1990, May 31, 1990, September 7, 1990, December 24, 1990, and April 16, 1991 respectively. This quarterly monitoring event was conducted on July 3, 1991. 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 this quarterly groundwater monitoring event including groundwater movement analysis, laboratory analytical results, summary of findings, and conclusions and discussions.

2.0 GROUNDWATER MOVEMENT ANALYSIS

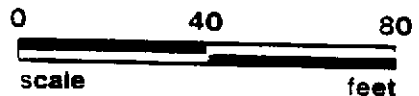
Prior to sample collection of this quarterly sampling, depth to water table in each of the three existing monitoring wells at the facility was measured for the analysis of groundwater movement. Table 1 presents a summary of the water levels in the three wells (EW-1, MW-2, and MW-3) from the groundwater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

From the result of the water level measurement on July 3, 1991, elevation of water levels were slightly increased in the three wells, as compared to the data collected in April 1990. Nevertheless, the groundwater flow direction remained in the same direction, flowing toward south (Figure 1). The hydraulic gradient was 0.013 feet per horizontal foot.



LEGEND

● MONITORING WELL LOCATION



↙ GROUNDWATER MOVEMENT DIRECTION (7/3/91)

AWD TECHNOLOGIES, INC



SITE LOCATION MAP
5800 CHRISTIE STREET
EMERYVILLE, CALIFORNIA

CUSTOMER: CHIC

JOB NUMBER 930-1000

DATE:

DRAWING NUMBER FIGURE 1

REV 0

TABLE 1
SUMMARY OF WATER LEVEL DATA

WELL IS	Elev. of TOC (Ft-MSL)	11/6/89		2/20/90		5/31/90		9/7/90		12/4/90		4/16/91		7/3/91	
		DTW Ft	SWL Ft	DTW Ft	SWL Ft	DTW Ft	SWL Ft	DTW Ft	SWL Ft	DTW Ft	SWL Ft	DTW Ft	SWL Ft	DTW Ft	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	6.02	2.60	6.20	2.42
MW-2	7.42	4.37	3.05	4.26	3.16	4.26	3.16	4.60	2.82	4.67	2.75	4.31	3.11	4.52	2.9
MW-3	6.42	5.10	1.32	5.42	1.00	4.93	1.49	5.15	1.17	5.96	1.35	5.25	1.17	5.33	1.09

Note:

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

AWD Technologies, Inc.

3.0 GROUNDWATER QUALITY

On July 3, 1991, 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 July 3, 1991 sampling episode are listed as following:

TPH	23,000 ppb
Benzene	650 ppb
Toluene	8,700 ppb
Ethylbenzene	<240 ppb
Xylenes	<80 ppb
1,1 DCE	<20 ppb
1,2 DCE	2,000 ppb
1,1 DCA	2,000 ppb
1,2 DCA	<20 ppb
1,1,1 TCA	250 ppb
1,1,2 TCA	<20 ppb
TCE	130 ppb
Chloroethane	170
Methylene Chloride	<130
Vinyl Chloride	1,900
Temperature	68.5°F
EC	11.61 millimhos/cm
pH	6.86

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 below:

Date of Sampling	4/25/89	11/6/89	2/20/90	5/31/90	9/7/90	12/4/90	4/16/91	7/3/91
Flow Direction	SW	S	S	S	S	S	S	S
Gradient	0.0014	0.012	0.016	0.0125	0.0115	0.045	0.014	0.013

Table 2 presents a summary of analytical results of well EW-1 in time series. The concentration of analytes detected in this quarterly sampling effort has declined as compared to the previous quarterly sampling. There are several factors that affect the changes in the hydrocarbon concentration. These factors are variations in water table, chemical breakdown due to natural degradation, and unidentified off site sources.

At present, an experiment is being tried to desorb the organic chemicals and oxidize them in place near well EW-1 by application of direct electrical current flow in the subsurface without pumping the groundwater. We will report any significant findings if it proved to be successful.

TABLE 2
SUMMARY OF QUARTERLY MONITORING RESULTS OF
HAZARDOUS ORGANIC COMPOUNDS

<u>COMPOUNDS</u>	<u>CONCENTRATIONS IN PPB</u>							
	<u>5/8/89</u>	<u>11/6/89</u>	<u>2/20/90</u>	<u>5/31/90</u>	<u>9/7/90</u>	<u>12/4/90</u>	<u>4/6/91</u>	<u>7/3/91</u>
TPH as Gasoline	NT	740	12,000	24,000	25,000	7,400	51,000	23,000
Benzene	ND	180	1,300	56	1,100	180	3,000	650
Toluene	190	39	3,600	6,100	800	3,500	12,000	8,700
Xylenes	170	67	47	140	42	<200	<900	<240
Ethylbenzene	ND	0.8	7.1	17	<25	<90	<200	<80
TCE	640	740	1,100	830	490	1,500	1,300	130
1,1 DCE	78	2.3	14	69	36	<30	<20	<20
1,2 DCE	ND	350	2,500	110	2,400	1,500	3,700	2,000
1,1,1 TCA	ND	26	550	1,200	510	72	2,900	200
1,1 DCA	ND	34	460	1,900	1,300	460	1,800	2,000
1,2 DCA	ND	4.8	34	33	53	<30	<20	<20
Vinyl Chloride	ND	29	ND	2,600	1,700	230	900	1990
Chloroethane	ND	ND	29	94	150	<30	<20	170
Methylene Chloride	ND	ND	14	40	22	<400	<20	<130

ND: Not Detected

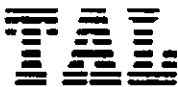
GROUNDWATER ANALYSIS REESULTS

Trace Analysis Laboratory, Inc.

3423 Investment Boulevard, #8 • Hayward, California 94545

Telephone (415) 783-6960

Facsimile (415) 783-1512



LOG NO.: 1081
 DATE SAMPLED: 7/3/91
 DATE RECEIVED: 7/3/91
 DATE ANALYZED: 7/12/91 and 7/16/91
 DATE REPORTED: 7/18/91

CUSTOMER: AWD Technologies
 REQUESTER: I-Sen Wang
 PROJECT: No. 2010, CHIC/AWD

Sample Type: Water

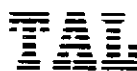
Method and Constituent	Units	EW-1		MW-2		MW-3	
		Concentration	Reporting Limit	Concentration	Reporting Limit	Concentration	Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	ug/l	23,000	600	ND	50	ND	50
Modified EPA Method 8020:							
Benzene	ug/l	650	80	ND	0.50	ND	0.50
Toluene	ug/l	8,700	80	ND	0.50	ND	0.50
Xylenes	ug/l	ND	240	ND	1.5	ND	1.5
Ethylbenzene	ug/l	ND	80	ND	0.50	ND	0.50

Method and Constituent	Units	Method Blank	
		Concentration	Reporting Limit
DHS Method:			
Total Petroleum Hydrocarbons as Gasoline	ug/l	ND	50
Modified EPA Method 8020:			
Benzene	ug/l	ND	0.50
Toluene	ug/l	ND	0.50
Xylenes	ug/l	ND	1.5
Ethylbenzene	ug/l	ND	0.50

QC Summary:

% Recovery: 65 and 83
 % RPD: 9.2 and 0.0

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



LOG NO.: 1081
DATE SAMPLED: 7/3/91
DATE RECEIVED: 7/3/91
DATE ANALYZED: 7/17/91
DATE REPORTED: 7/18/91
PAGE: Two

Sample Type: Water

<u>Method and Constituent</u>	<u>Units</u>	<u>EW-1</u>		<u>MW-2</u>		<u>MW-3</u>	
		<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>	<u>Concen- tration</u>	<u>Reporting Limit</u>
EPA Method 8010:							
Benzyl Chloride	ug/l	ND	20	ND	1.0	ND	1.0
Bis (2-Chloroethoxy) Methane	ug/l	ND	20	ND	1.0	ND	1.0
Bis (2-Chloroisopropyl) Ether	ug/l	ND	20	ND	1.0	ND	1.0
Bromobenzene	ug/l	ND	20	ND	1.0	ND	1.0
Bromodichloromethane	ug/l	ND	20	ND	1.0	ND	1.0
Bromoform	ug/l	ND	20	ND	1.0	ND	1.0
Bromomethane	ug/l	ND	20	ND	1.0	ND	1.0
Carbon Tetrachloride	ug/l	ND	20	ND	1.0	ND	1.0
Chloracetaldehyde	ug/l	ND	20	ND	1.0	ND	1.0
Chloral	ug/l	ND	20	ND	1.0	ND	1.0
Chlorobenzene	ug/l	ND	20	ND	1.0	ND	1.0
Chloroethane	ug/l	170	30	ND	1.0	ND	1.0
Chloroform	ug/l	ND	20	ND	1.0	ND	1.0
1-Chlorohexane	ug/l	ND	20	ND	1.0	ND	1.0
2-Chloroethyl Vinyl Ether	ug/l	ND	20	ND	1.0	ND	1.0

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



LOG NO.: 1081
DATE SAMPLED: 7/3/91
DATE RECEIVED: 7/3/91
DATE ANALYZED: 7/17/91
DATE REPORTED: 7/18/91
PAGE: Three

Sample Type: Water

Method and Constituent	Units	EW-1		MW-2		MW-3	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
EPA Method 8010 (Continued):							
Chloromethane	ug/l	ND	20	ND	1.0	ND	1.0
Chloromethyl Methyl Ether	ug/l	ND	20	ND	1.0	ND	1.0
Chlorotoluene	ug/l	ND	20	ND	1.0	ND	1.0
Dibromochloromethane	ug/l	ND	20	ND	1.0	ND	1.0
Dibromomethane	ug/l	ND	20	ND	1.0	ND	1.0
1,2-Dichlorobenzene	ug/l	ND	20	ND	1.0	ND	1.0
1,3-Dichlorobenzene	ug/l	ND	20	ND	1.0	ND	1.0
1,4-Dichlorobenzene	ug/l	ND	20	ND	1.0	ND	1.0
Dichlorodifluoromethane	ug/l	ND	20	ND	1.0	ND	1.0
1,1-Dichloroethane	ug/l	2,000	10	1.1	0.50	ND	0.50
1,2-Dichloroethane	ug/l	25	10	ND	0.50	ND	0.50
1,1-Dichloroethylene	ug/l	12	11	ND	0.50	ND	0.50
Trans-1,2-Dichloro- ethylene	ug/l	2,000	10	1.1	0.50	ND	0.50
Dichloromethane	ug/l	ND	130	ND	6.4	ND	6.4
1,2-Dichloropropane	ug/l	ND	20	ND	1.0	ND	1.0
1,3-Dichloropropylene	ug/l	ND	20	ND	1.0	ND	1.0
1,1,2,2-Tetrachloro- ethane	ug/l	ND	20	ND	1.0	ND	1.0

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

LOG NO.: 1081
 DATE SAMPLED: 7/3/91
 DATE RECEIVED: 7/3/91
 DATE ANALYZED: 7/17/91
 DATE REPORTED: 7/18/91
 PAGE: Four

Sample Type: Water

Method and Constituent	Units	EW-1		MW-2		MW-3	
		Concen- tration	Reporting Limit	Concen- tration	Reporting Limit	Concen- tration	Reporting Limit
EPA Method 8010 (Continued):							
1,1,1,2-Tetrachloro- ethane	ug/l	ND	20	ND	1.0	ND	1.0
Tetrachloroethylene	ug/l	ND	20	ND	1.0	ND	1.0
1,1,1-Trichloroethane	ug/l	250	10	ND	0.50	ND	0.50
1,1,2-Trichloroethane	ug/l	ND	20	ND	1.0	ND	1.0
Trichloroethylene	ug/l	130 ✓	10	ND	0.50	ND	0.50
Trichlorofluoro- methane	ug/l	ND	20	ND	1.0	ND	1.0
Trichloropropane	ug/l	ND	20	ND	1.0	ND	1.0
Vinyl Chloride	ug/l	1,900 ✓	30	ND	1.0	ND	1.0

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



LOG NO.: 1081
DATE SAMPLED: 7/3/91
DATE RECEIVED: 7/3/91
DATE ANALYZED: 7/17/91
DATE REPORTED: 7/18/91
PAGE: Five

Sample Type: Water

<u>Method and Constituent</u>	<u>Units</u>	<u>Method Blank</u>	
		<u>Concen- tration</u>	<u>Reporting Limit</u>
EPA Method 8010:			
Benzyl Chloride	ug/l	ND	1.0
Bis (2-Chloroethoxy) Methane	ug/l	ND	1.0
Bis (2-Chloroisopropyl) Ether	ug/l	ND	1.0
Bromobenzene	ug/l	ND	1.0
Bromodichloromethane	ug/l	ND	1.0
Bromoform	ug/l	ND	1.0
Bromomethane	ug/l	ND	1.0
Carbon Tetrachloride	ug/l	ND	1.0
Chloroacetaldehyde	ug/l	ND	1.0
Chloral	ug/l	ND	1.0
Chlorobenzene	ug/l	ND	1.0
Chloroethane	ug/l	ND	1.0
Chloroform	ug/l	ND	1.0
1-Chlorohexane	ug/l	ND	1.0
2-Chloroethyl Vinyl Ether	ug/l	ND	1.0

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



LOG NO.: 1081
DATE SAMPLED: 7/3/91
DATE RECEIVED: 7/3/91
DATE ANALYZED: 7/17/91
DATE REPORTED: 7/18/91
PAGE: Six

Sample Type: Water

<u>Method and Constituent</u>	<u>Units</u>	<u>Method Blank</u>	
		<u>Concen- tration</u>	<u>Reporting Limit</u>
EPA Method 8010 (Continued):			
Chloromethane	ug/l	ND	1.0
Chloromethyl Methyl Ether	ug/l	ND	1.0
Chlorotoluene	ug/l	ND	1.0
Dibromochloromethane	ug/l	ND	1.0
Dibromomethane	ug/l	ND	1.0
1,2-Dichlorobenzene	ug/l	ND	1.0
1,3-Dichlorobenzene	ug/l	ND	1.0
1,4-Dichlorobenzene	ug/l	ND	1.0
Dichlorodifluoromethane	ug/l	ND	1.0
1,1-Dichloroethane	ug/l	ND	0.50
1,2-Dichloroethane	ug/l	ND	0.50
1,1-Dichloroethylene	ug/l	ND	0.50
Trans-1,2-Dichloro- ethylene	ug/l	ND	0.50
Dichloromethane	ug/l	ND	6.4
1,2-Dichloropropane	ug/l	ND	1.0
1,3-Dichloropropylene	ug/l	ND	1.0
1,1,2,2-Tetrachloro- ethane	ug/l	ND	1.0

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

LOG NO.: 1081
 DATE SAMPLED: 7/3/91
 DATE RECEIVED: 7/3/91
 DATE ANALYZED: 7/17/91
 DATE REPORTED: 7/18/91
 PAGE: Seven


Sample Type: Water

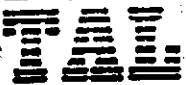
<u>Method and Constituent</u>	<u>Units</u>	<u>Method Blank</u>	
		<u>Concen- tration</u>	<u>Reporting Limit</u>
EPA Method 8010 (Continued):			
1,1,1,2-Tetrachloroethane	ug/l	ND	1.0
Tetrachloroethylene	ug/l	ND	1.0
1,1,1-Trichloroethane	ug/l	ND	0.50
1,1,2-Trichloroethane	ug/l	ND	1.0
Trichloroethylene	ug/l	ND	0.50
Trichlorofluoromethane	ug/l	ND	1.0
Trichloropropane	ug/l	ND	1.0
Vinyl Chloride	ug/l	ND	1.0

QC Summary:

% Recovery: 124
 % RPD: 0

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


 Louis W. DuPuis
 Quality Assurance/Quality Control Manager



CHAIN OF CUSTODY RECORD

Proj. No.		Project Name		No. of Containers	1001 602 (TPH/PAHs) BTXG 1081			
Samplers: (signature) <i>J. Wang</i>								
Sample ID	Date	Time	Site Location					
EW-1	7/3/91	14:50	Extraction	4x40ml	X	X		2 vials w/ HCl
MW-2	7/3/91	14:10	Shellmound	4x40ml	X	X		2 vials w/ HCl
MW-3	7/3/91	14:30	Powell	4x40ml	X	X		2 vials w/ HCl
								Res TAT 2-40ml, 2-40ml/HCl Green PR
Relinquished by: (signature) <i>J. Wang</i>				Date/Time	Received by: (signature) For TAL <i>Richard Smith</i>			Date/Time 7/3/91 3:50 PM
Relinquished by: (signature)				Date/Time	Received by: (signature)			Date/Time
Received for Laboratory by: (signature)							Date/Time	
REMARKS								