

90 JUL 12 PM 2:23

July 10, 1990

Mr. Robert Wenning  
Engineering Manager  
James River Corporation  
2101 Williams Street  
San Leandro, California 94577

11-5081-02/3

Subject: First Quarter Groundwater Monitoring Report,  
James River Corporation, Flexible Packaging Plant,  
2101 Williams Street, San Leandro, California

Dear Mr. Wenning:

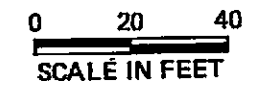
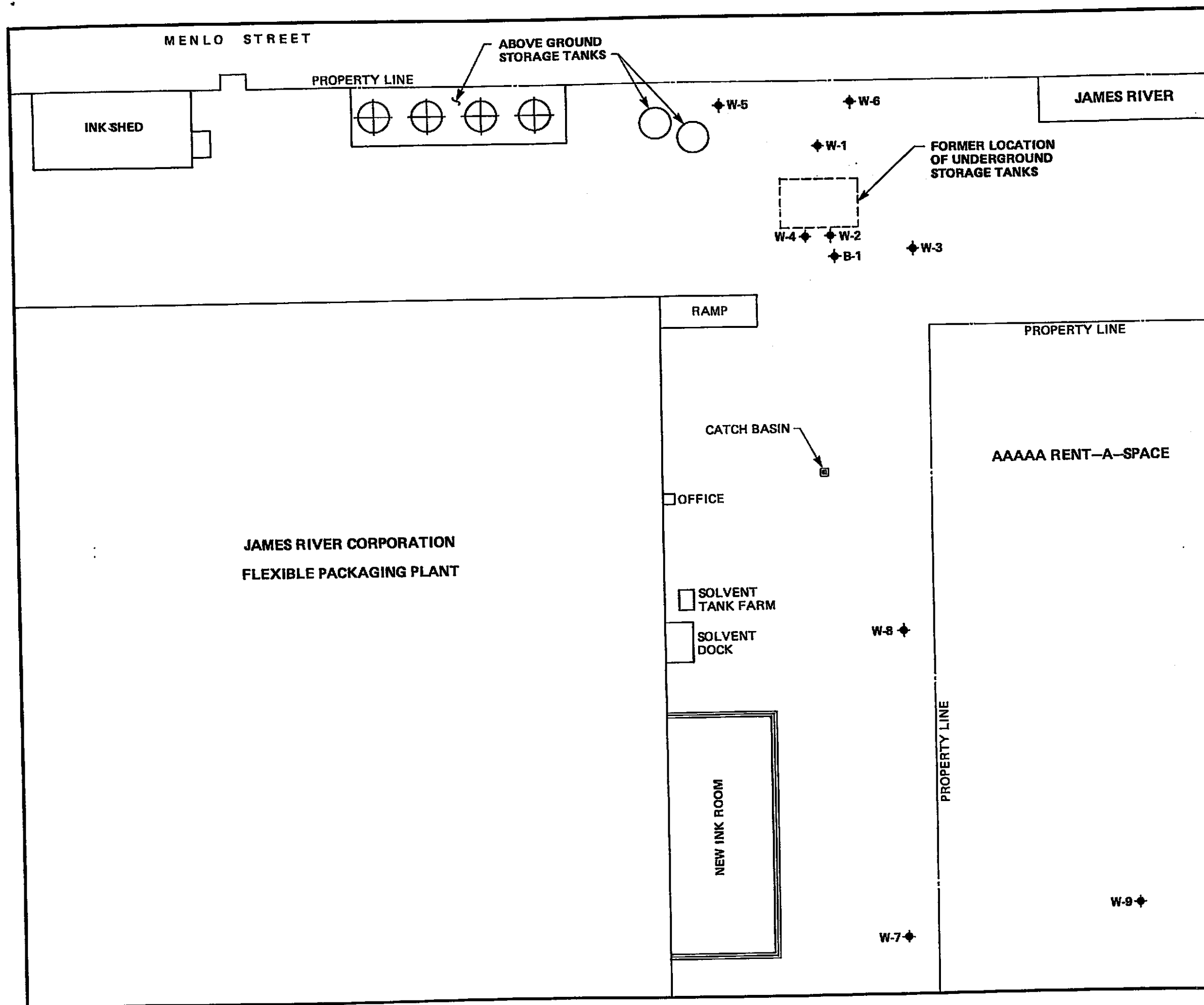
This letter report presents the methods and results of the first quarterly groundwater sampling conducted on March 6 and 7, 1990 at the subject facility. This work was performed under the terms and conditions of our engineering services agreement dated December 8, 1988, and your Purchase Order No. SL02826-EE dated February 6, 1990.

### **Background**

Ten groundwater monitoring wells were installed in the vicinity of the former underground storage tanks (UST's) by Harding-Lawson Associates in the period from 1984 to 1986 (Figure 1). The monitoring wells were installed during an investigation of acetates and acetones in the shallow groundwater at the site. Documented releases of isopropyl acetate and n-propyl acetate occurred from the UST's. All USTs were removed from this location in 1989.

Wells W-1 through W-9 monitor a gravelly sand to sandy gravel encountered at approximately 25 feet below grade. The sandy unit averages 10 to 15 feet in thickness. Well B-1 monitors a deeper gravelly interval encountered at approximately 45 feet below grade. A 5-foot thick silty clay separates the two water-bearing zones at the location of B-1.

James River initiated design of a groundwater remediation system to remove the acetates from the shallow groundwater in 1988. The proposed system consisted of extracting the groundwater, pumping it to above ground storage tanks, and then discharging it to the San Leandro sanitary sewer on a daily basis. In April 1988, the City of San Leandro issued James River a permit to discharge the extracted groundwater to the



- LEGEND:**
- ◆ W-1 MONITORING WELL
  - ◆ B-1 MONITORING WELL (DEEP)

Figure 1 Site Map

sanitary sewer. The permit specified discharge limitations for a variety of compounds, as established in San Leandro Administrative Code, Title 12, Chapter 5.

In March 1989, Brown and Caldwell collected groundwater samples from eight existing wells prior to initiation of the groundwater remediation program. Results of the sampling indicated chlorinated hydrocarbons were present in several shallow groundwater monitoring wells. The highest levels of chlorinated hydrocarbons were detected in wells located hydraulically upgradient of the site. These levels exceeded permit discharge limitations, thus, the groundwater remediation plan was not implemented.

In April 1989, excavation related to construction activities encountered pigment stained soils in the area shown on Figure 1. These soils were later excavated and properly disposed of by James River. During the 1989 removal of the USTs, additional stained soils were encountered in the area illustrated on Figure 1.

Based on discussions with Alameda County Health Agency (County) personnel, a plan for further investigations at the site was developed. The plan includes an investigation of shallow groundwater immediately upgradient of the site, further excavation of soils in the vicinity of the ink room, and quarterly groundwater monitoring of the nine existing wells. A groundwater remediation plan will be formulated when all data from the planned investigations is reviewed.

#### **Field Methods**

Groundwater samples were collected from nine of the ten existing monitoring wells. A groundwater sample could not be collected from well W2 due to blockage of the well casing which prevented the pump suction line from reaching groundwater. Prior to sample collection, 3 to 5 well volumes of water were purged from each well using a gasoline powered centrifugal pump. As each well was purged, the specific conductance, pH, and temperature of the groundwater were measured. The purpose of monitoring these parameters was to ensure that all stagnant water present in the well casing was removed prior to sample collection. Samples were collected after these parameters had stabilized. Data sheets presenting these measurements are included as Attachment A. Water produced during purging of monitoring wells was stored on-site in sealed 55-gallon drums pending receipt of laboratory analyses.

Samples were collected with a Teflon bailer and decanted into 40 milliliter, glass sample vials equipped with a Teflon septum. The vials were provided by Brown and Caldwell Analytical (BCA). The vials were filled so that no head space was present in the sample container. Samples were stored in a

chilled ice chest until delivery to BCA. Standard chain-of-custody procedures were followed during sample handling.

The bailer and suction line of the pump were washed with laboratory-grade detergent and rinsed with tap water between sample locations. A new length of rope was attached to the bailer prior to sampling each well to prevent cross-contamination of samples.

### **Analytical Methods**

Groundwater samples were submitted for analysis to BCA on March 7, 1990. The samples were analyzed for purgeable priority pollutant organic chemicals using EPA test method 8240. This test method uses gas chromatography/mass spectrometry methods. The analytical method is described in detail in the EPA Publication SW-846, "Test Methods for Evaluating Solid Waste", November 1986.

### **Groundwater Quality Results**

Analytical results for the first quarter samples are summarized in Table 1. Only constituents present above method detection limits are included. Analytical results for samples collected in April and August 1989 are included for comparison purposes. The chain-of-custody form and laboratory analytical reports for the first quarter samples are included as Attachment B. The following paragraphs summarize significant findings.

**Alcohol, Acetates, and Acetone.** Total acetate and total alcohol concentrations have declined from several thousand milligrams per liter (mg/l) in 1984 (Harding-Lawson Associates), to non-detectable levels.

Acetone was detected in wells W1, W4, and W8 at concentrations ranging from 290,000 to 400,000 micrograms per liter (ug/l). Acetone was reported using semi-quantified methods for samples collected in April and August, 1989. However, the results were actually quantified results reported incorrectly. A letter from BCA documenting their reporting error is included as Attachment C. The results indicate that acetone concentrations are decreasing. The source of acetone in the groundwater has not been determined.

**Purgeable Organic Chemicals.** The hydrocarbons toluene, tetrachloroethylene (PCE), trichloroethylene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), and vinyl chloride were identified in shallow groundwater samples collected this quarter. Due to changes in detection limits between samples collected this quarter and those previously collected, comparisons between sampling events cannot be made for all constituents. However, where comparisons are possible, the



Table 1. Groundwater Analytical Results

Well Identification Sampling Date	W1			W2	W3			W4		
	Apr-89	Aug-89	Mar-90	Apr-89	Apr-89	Aug-89	Mar-90	Apr-89	Aug-89	Mar-90
PARAMETER										
Purgeable Organic Compounds, ug/l										
Acetone	68,000	370,000	290,000	66,000	25,000	3,000	<50	760,000	560,000	400,000
Benzene	<100	<500	<500	<50	<10	<50	<5	<100	<2000	<500
Tetrachloroethene	300	<500	<500	1,000	1,200	100	29	140	<2000	<500
Trichloroethene	<100	<500	<500	<50	230	<50	130	<100	<2000	<500
Toluene	<100	<500	<500	920	<10	<50	<5	2,900	8,000	1,200
Vinyl Chloride	300	<500	<500	450	39	<50	24	<100	<2000	<500
1,2-Dichloroethene	730	<500	<500	1,400	170	<50	<5	720	<2000	<500
1,1,1-Trichloroethane	<100	<500	<500	<50	<10	<50	<5	<100	<2000	<500
cis-1,2-Dichloroethene	-	-	<500	-	-	-	400	-	-	<500
Semi-Quantified Results										
2-Butanone	-	-	-	-	-	-	-	-	-	-
2-Hexanone	-	-	-	1,700	540	-	-	8,200	40,000	-
C3H6O2 Ester	-	-	-	-	-	-	-	60,000	100,000	-
C5H10O2 Ester	-	-	-	1,000	-	-	-	-	-	-
Diisopropyl Ether	-	-	-	-	-	-	30	-	-	-
Ethanol	-	-	-	500	-	-	-	-	-	-
Isopropanol	-	-	-	6,000	500	-	-	30,000	-	-
Methyl Acetate	-	-	-	200	-	-	-	-	-	-
Methylethylacetate	-	-	-	-	-	-	-	-	-	10,000
N-Butyl Acetate	-	-	-	4,400	-	-	-	-	-	-
Propyl Acetate	-	-	-	900	-	-	-	-	-	-
Total Xylene Isomers	-	-	-	-	-	-	-	400	-	-
Methyl Ethyl Ketone	-	-	-	-	-	-	-	-	-	-

Notes:

1. ug/l = micrograms per liter
2. \* denotes duplicate sample
3. Well W2 is damaged and is no longer sampled.
4. - indicates not reported
5. Semi-quantified results based upon comparison of total ion count of the compound with that of the nearest internal standard

Table 1. Groundwater Analytical Results (continued)

Well Identification Sampling Date	W 5				W6			W7		
	Apr-89	Aug-89	Aug-89*	Mar-90	Apr-89	Aug-89	Mar-90	Apr-89	Aug-89	Mar-90
PARAMETER										
Purgeable Organic Compounds, ug/l										
Acetone	77	-	-	<20	-	-	<200	2,100	-	<50
Benzene	<1	<50	<50	<20	<1	<5	<20	<1	<5	<5
Tetrachloroethene	5,000	1,300	1,100	5,600	1,400	920	1,700	1,100	940	740
Trichloroethene	600	450	450	460	240	240	280	260	240	240
Toluene	7	<50	<50	<20	<1	<5	<20	4	<5	<5
Vinyl Chloride	1,000	690	620	190	<1	<5	<20	43	<5	<5
1,2-Dichloroethene	6,000	5,000	4,000	<20	12	<5	<20	140	60	<5
1,1,1-Trichloroethane	<1	<50	<50	<20	<1	5	<20	<1	<5	<5
cis-1,2-Dichloroethene	-	-	-	1,900	-	-	<20	-	-	72
Semi-Quantified Results										
2-Butanone	-	-	-	-	-	-	-	-	-	-
2-Hexanone	9	-	-	-	-	-	-	-	-	-
C3H6O2 Ester	-	-	-	-	-	-	-	-	-	-
C5H10O2 Ester	-	-	-	-	-	-	-	-	-	-
Diisopropyl Ether	-	-	-	-	-	-	-	-	-	-
Ethanol	-	-	-	-	-	-	-	20	-	-
Isopropanol	-	-	-	-	-	-	-	200	-	-
Methyl Acetate	-	-	-	-	-	-	-	-	-	-
Methylethylacetate	-	-	-	-	-	-	-	-	-	-
N-Butyl Acetate	-	-	-	-	-	-	-	-	-	-
Propyl Acetate	-	-	-	-	-	-	-	-	-	-
Total Xylene Isomers	-	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone	-	-	-	-	-	-	-	79	-	-

Notes:

1. ug/l = micrograms per liter
2. \* denotes duplicate sample
3. - indicates not reported
4. Semi-quantified results based upon comparison of total ion count of the compound with that of the nearest internal standard

Table 1. Groundwater Analytical Results (continued)

Well Identification	W8			W9			B1		
	Apr-89	Aug-89	Mar-90	Apr-89	Aug-89	Mar-90	Apr-89	Aug-89	Mar-90
PARAMETER									
Purgeable Organic Compounds, ug/l									
Acetone	780,000	8,300	870,000	1,400	-	<10	4,500	-	>10
Benzene	<5	<50	<1000	2	<1	<1	<1	>1	>1
Tetrachloroethene	120	<50	<1000	33	37	13	12	6	2
Trichloroethene	<5	<50	<1000	34	37	21	<1	>1	>1
Toluene	200	<50	<1000	7	<1	<1	10	>1	>1
Vinyl Chloride	15	<50	<1000	3	<1	<1	<1	>1	>1
1,2-Dichloroethene	35	<50	<1000	16	<1	<1	7	>1	>1
1,1,1-Trichloroethane	<5	<50	<1000	3	2	<1	<1	6	>1
cis-1,2-Dichloroethene	-	-	<1000	-	-	<1	-	-	2
Semi-Quantified Results									
2-Butanone	-	2,600	-	-	-	-	-	-	-
2-Hexanone	6,400	-	-	36	-	-	38	-	-
C3H6O2 Ester	-	-	-	-	-	-	200	-	-
C5H10O2 Ester	-	-	-	-	-	-	-	-	-
Diisopropyl Ether	-	-	-	-	-	-	-	-	-
Ethanol	200	-	-	10	-	-	-	-	-
Isopropanol	5,000	-	-	100	-	-	60	-	-
Methyl Acetate	40	-	-	-	-	-	-	-	-
Methylethylacetate	-	-	-	-	-	-	-	-	-
N-Butyl Acetate	-	-	-	-	-	-	-	-	-
Propyl Acetate	-	-	-	-	-	-	-	-	-
Total Xylene Isomers	-	-	-	-	-	-	-	-	-
Methyl Ethyl Ketone	-	-	-	-	-	-	-	-	-

- Notes:
1. ug/l = micrograms per liter.
  2. \* denotes duplicate sampl.
  3. - indicates not reported
  4. Semi-quantified results based upon comparison of total ion count of the compound with that of the nearest internal standard



data indicate that, in general, concentrations of organic compounds in the shallow groundwater are decreasing. An exception to this trend is the concentration of PCE in wells W5 and W6, which increased slightly.

Cis-1,2-dichloroethene had not been detected in previous sampling events. However, 1,2-Dichloroethane was previously present in wells that now contain reported concentrations of cis-1,2-DCE. BCA personnel indicate that previously reported 1,2-DCE concentrations represent the total 1,2-DCE concentration. The 1,2-DCE concentration is now reported for individual isomers (i.e. cis-1,2-DCE or trans-1,2-DCE).

### **Groundwater Flow**

Water levels were measured with an electric water level sounder in each monitoring well on March 5, 1990. Groundwater elevations were calculated using top-of-casing elevations as reported in an April 10, 1986 Harding-Lawson Associates report. Groundwater elevation data are summarized in Table 2. Data collected on August 16, September 9, October 10, and November 12, 1989 are included for comparison purposes.

Historical groundwater elevation data indicate that groundwater levels measured in March 1990 are higher than those measured in the months of August to November 1989. The higher groundwater levels in March are probably a reflection of increased precipitation and recharge during the wet season (November through April).

Figure 2 illustrates the configuration of the shallow groundwater in the vicinity of the site based on the March 5, 1990 measurements. Groundwater flows to the southwest, toward San Francisco Bay, under a hydraulic gradient of approximately 0.004 feet per foot. This gradient is higher than that calculated from the November 1989 data. San Francisco Bay is located approximately one-half mile southwest of the site.

The groundwater mound in the vicinity of the former tank location may be a result of removing the relatively impermeable asphalt in that location to conduct tank and pipeline removal. Increased infiltration of precipitation may be occurring in the area where no asphalt is present, causing groundwater levels to rise. The asphalt will be replaced upon the completion of pipeline removal. Future water level monitoring will aid in determining whether the mound is an actual hydrologic feature or is related to increased infiltration.

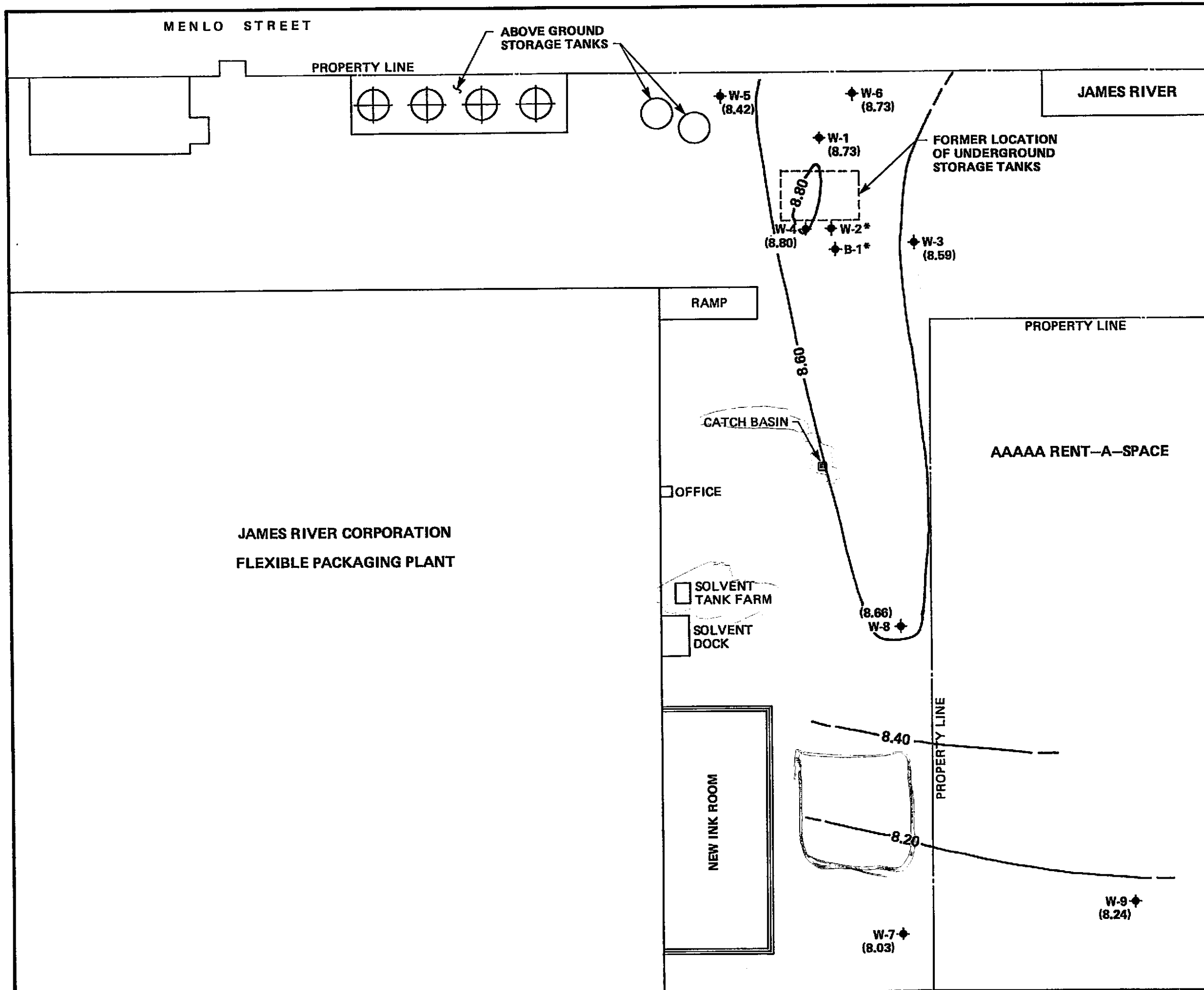


Table 2 Summary of Groundwater Level Elevations

WELL I.D. TOC Elevation	W1 20.67	W2 20.02	W3 20.80	W4 21.00	W5 21.64	W6 21.05	W7 20.41	W8 20.50	W9 20.16	B1 20.59
DATE										
3/5/90	8.73	7.58	8.59	8.80	8.42	8.73	8.03	8.66	8.24	8.66
11/13/89	7.01	5.71	6.95	6.99	6.92	7.00	6.59	7.09	6.79	7.00
10/9/89	7.07	-	6.98	7.04	6.99	7.06	6.65	6.94	6.87	7.04
9/28/89	7.01	-	6.93	6.98	6.96	7.03	6.59	7.14	-	7.01
8/16/89	7.04	-	6.95	7.02	6.96	7.03	7.09	6.73	6.85	6.99

Note:

All groundwater elevations in feet above mean sea level.  
 TOC = top of casing elevations, from Harding-Lawson Associates, 1984.  
 - indicates no data available.



**LEGEND:**

- ◆ W-1 MONITORING WELL
- ◆ B-1 MONITORING WELL (DEEP)
- \* WELLS W-2 (DAMAGED) AND B-1 (DEEP) WERE NOT USED IN CONSTRUCTING CONTOURS
- (8.73) GROUNDWATER ELEVATION
- 8.80 GROUNDWATER CONTOUR ELEVATION, feet (mean sea level)

Figure 2 Groundwater Configuration, March 5, 1990

Mr Robert Wenning  
July 10, 1990  
Page 11 of 11

### Summary

Alcohols and acetates were not detected in the groundwater samples collected this quarter. Acetone was detected in wells W1, W4, and W8. With the exception of PCE in wells W5 and W6, concentrations of purgeable organic constituents have generally decreased when compared to previous analytical results.

Groundwater levels have increased when compared to data collected during the dry season last year. The increase probably reflects seasonal variations related to precipitation. Groundwater in the vicinity of the James River Corporation site flows to the southwest, toward San Francisco Bay.

We appreciate this opportunity to be of service to you. Please contact me if you have any questions or comments regarding this report.

Very truly yours,  
BROWN AND CALDWELL



Donna L. Courington  
Project Manager

DLC:dc

Enclosures

cc: Mr. Larry Seto, Alameda County Health Agency  
Mr. Lester Feldman, San Francisco Regional Water Quality  
Control Board





JAMES RIVER - SAN LEANDRO  
KUM 503102, 3-5-90

- 1) 0945 - SPOKE W/ D. COORINGTON ABOUT SITE
- 2) 1000 - PACK VEHICLE FOR JOB
- 3) 1130 - ARRIVE SITE, MET W/ BOB WENNING, MADE INTRODUCTIONS, SAID HE NEEDED TIME TO GET 55 GAL DRUMS TOGETHER NOTIFIED HIM THAT HE WOULD BE IN REAR (2) WELL LOCATIONS TAKING SLS.
- 4) 1155 - BEGAN TAKING SLS

WELL ID	SWE	ID	REMARKS
W-0	12.32'	36.55'	2"
W-1	11.94'	38.90'	4"
B-1	11.93'	48.23'	4"
W-4	12.20'	37.50'	4"
<del>W-2</del>	13.01'	14.65'	2"
	14.10'		
	- 1.56'		
	12.54'		
W-8	13.5' - 14.6' = 11.84'	24.68'	4" Steel protective casing full of water
W-3	12.21'	37.1'	4" Visibly seeping into well
W-5	11.72'	33.75'	
W-7	12.38'	36.34'	4"
W-9	11.90'	31.39'	4"

5) 1530 - LEFT SITE



JAMES RIVER, SAN LEANDRO  
KPC 5001-02, 3-10-90

- 1) 0745 - STOP TO GET FUEL FOR PUMPS
- 2) 0800 - ARRIVE @ BCL OFFICE, PICK UP SANDY
- 3) 0840 - ARRIVE SITE, CANNOT LOCATE DRUMS
- 4) 0905 - WENT IN TO SEE BOB
- 5) 0910 - BOB NOT IN, ANOTHER GENTLEMAN GOT THE DRUMS  
ARRANGED
- 6) 0930 - DRUMS ARRIVED
- 7) 1035 - CALIBRATE PH & S.C. METERS  
 PH-4 = 4.00  
 PH-7 = 7.03  
 PH-10 = 10.00
- 8) 1600 - LEFT SITE
- 9) 0000 - ARRIVE BCL, PICK UP SANDY, GET PICK-UP TRUCK,  
LOAD EQUIP.
- 2) 0910 - ARRIVE SITE, PICK UP PALLET & 55 GAL DRUM
- 3) 1010 - LEFT SITE
- 4) 1033 - ARRIVE LAB, TURN OVER SAMPLES
- 5) 1105 - ARRIVE BCL

JOB NUMBER		SUBJECT	DATE	SHEET NO. /
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**CHAIN OF CUSTODY RECORD**

BC Log Number \_\_\_\_\_

Client name <b>BC P.H.</b>				Project or PO# <b>5091-02</b>		<div style="text-align: center;">Analyses required</div> <div style="text-align: center; border: 1px solid black; padding: 5px;">                 (Grid for analyses with diagonal lines and text: "Hazardous sample Special handling required")             </div>					
Address <b>10000 VIKING AVE.</b>				Phone #							
City, State, Zip <b>WILSONVILLE, OR 97152</b>			Report attention <b>DONNA COURINGTON</b>								
Lab Sample number	Date sampled	Time sampled	Type See key below	Sampled by <b>K. McILVENNA, S. HALLOCK</b>	Number of containers	Remarks					
1	3-6		GW	W-3 ✓	1	X (Vertical lines)					
2				W-7 ✓							
3				W-5 ✓							
4				W-1 ✓							
5				W-5 ✓							
6				W-4 ✓							
7				W-6 ✓							
8				W-9 ✓							
9	3-7										

Signature	Print Name	Company	Date	Time
	KEVIN L. McILVENNA	BC P.H.	3-7-90	
Received by				
Relinquished by				
Received by				
Relinquished by				
Received by Laboratory	Monika Scott	BCA	3-7-90	

- BROWN AND CALDWELL LABORATORIES**
- 1255 Powell Street, Emeryville, CA 94608 (415) 428-2300
  - 373 South Fair Oaks Avenue, Pasadena, CA 91105 (818) 795-7553
  - 1200 Pacific Avenue, Anaheim, CA 92805

Note:  
 Samples are discarded 30 days after results are reported unless other arrangements are made.  
 Hazardous samples will be returned to client or disposed of at client expense.

\*KEY: AQ—Aqueous NA—Nonaqueous SL—Sludge GW—Groundwater SO—Soil OT—Other PE—Petroleum

ATTACHMENT B

CHAIN OF CUSTODY FORM/  
LABORATORY ANALYTICAL REPORTS

# Analytical Report

LOG NO: E90-03-212

Received: 07 MAR 90

Reported: 22 MAR 90

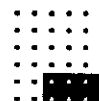
Ms. Donna Courington  
Brown and Caldwell  
3480 Buskirk Avenue  
Pleasant Hill, California 94523

Project: 5081-02

## REPORT OF ANALYTICAL RESULTS

Page 1

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED				
03-212-1	W-8	06 MAR 90				
03-212-2	W-7	06 MAR 90				
03-212-3	W-3	06 MAR 90				
03-212-4	B-1	06 MAR 90				
03-212-5	W-1	06 MAR 90				
PARAMETER	03-212-1	03-212-2	03-212-3	03-212-4	03-212-5	
Purgeable Priority Pollutants						
Date Extracted	03.14.90	03.20.90	03.20.90	03.14.90	03.14.90	
1,1,1-Trichloroethane, ug/L	<1000	<5	<5	<1	<500	
1,1,2,2-Tetrachloroethane, ug/L	<1000	<5	<5	<1	<500	
1,1,2-Trichloroethane, ug/L	<1000	<5	<5	<1	<500	
1,1-Dichloroethane, ug/L	<1000	<5	<5	<1	<500	
1,1-Dichloroethene, ug/L	<1000	<5	<5	<1	<500	
1,2-Dichloroethane, ug/L	<1000	<5	<5	<1	<500	
1,2-Dichloropropane, ug/L	<1000	<5	<5	<1	<500	
1,3-Dichloropropene, ug/L	<1000	<5	<5	<1	<500	
2-Chloroethylvinylether, ug/L	<1000	<5	<5	<1	<500	
2-Hexanone, ug/L	<1000	<5	<5	<1	<500	
Acetone, ug/L	870000	<50	<50	<10	290000	
Acrolein, ug/L	<10000	<50	<50	<10	<5000	
Acrylonitrile, ug/L	<10000	<50	<50	<10	<5000	
Bromodichloromethane, ug/L	<1000	<5	<5	<1	<500	
Bromomethane, ug/L	<1000	<5	<5	<1	<500	
Benzene, ug/L	<1000	<5	<5	<1	<500	
Bromoform, ug/L	<1000	<5	<5	<1	<500	
Chlorobenzene, ug/L	<1000	<5	<5	<1	<500	
Carbon Tetrachloride, ug/L	<1000	<5	<5	<1	<500	
Chloroethane, ug/L	<1000	<5	<5	<1	<500	
Chloroform, ug/L	<1000	<5	<5	<1	<500	



# Analytical Report

LOG NO: E90-03-212

Received: 07 MAR 90

Reported: 22 MAR 90

Ms. Donna Courington  
Brown and Caldwell  
3480 Buskirk Avenue  
Pleasant Hill, California 94523

Project: 5081-02

## REPORT OF ANALYTICAL RESULTS

Page 2

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED				
03-212-1	W-8	06 MAR 90				
03-212-2	W-7	06 MAR 90				
03-212-3	W-3	06 MAR 90				
03-212-4	B-1	06 MAR 90				
03-212-5	W-1	06 MAR 90				
PARAMETER	03-212-1	03-212-2	03-212-3	03-212-4	03-212-5	
Chloromethane, ug/L	<1000	<5	<5	<1	<500	
Carbon Disulfide, ug/L	<1000	<5	<5	<1	<500	
Dibromochloromethane, ug/L	<1000	<5	<5	<1	<500	
Ethylbenzene, ug/L	<1000	<5	<5	<1	<500	
Freon 113, ug/L	<1000	<5	<5	<1	<500	
Methyl ethyl ketone, ug/L	<20000	<100	<100	<20	<10000	
Methyl isobutyl ketone, ug/L	<1000	<5	<5	<1	<500	
Methylene chloride, ug/L	<1000	<5	<5	<1	<500	
Styrene, ug/L	<1000	<5	<5	<1	<500	
Trichloroethene, ug/L	<1000	240	130	<1	<500	
Trichlorofluoromethane, ug/L	<1000	<5	<5	<1	<500	
Toluene, ug/L	<1000	<5	<5	<1	<500	
Tetrachloroethene, ug/L	<1000	740	29	2	<500	
Vinyl acetate, ug/L	<1000	<5	<5	<1	<500	
Vinyl chloride, ug/L	<1000	<5	24	<1	<500	
Total Xylene Isomers, ug/L	<1000	<5	<5	<1	<500	
cis-1,2-Dichloroethene, ug/L	<1000	72	400	2	<500	
trans-1,2-Dichloroethene, ug/L	<1000	<5	<5	<1	<500	
trans-1,3-Dichloropropene, ug/L	<1000	<5	<5	<1	<500	
Semi-Quantified Results **						
Diisopropyl Ether, ug/L	---	---	30	---	---	

# Analytical Report

LOG NO: E90-03-212

Received: 07 MAR 90

Reported: 22 MAR 90

Ms. Donna Courington  
Brown and Caldwell  
3480 Buskirk Avenue  
Pleasant Hill, California 94523

Project: 5081-02

## REPORT OF ANALYTICAL RESULTS

Page 3

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
03-212-1	W-8	06 MAR 90
03-212-2	W-7	06 MAR 90
03-212-3	W-3	06 MAR 90
03-212-4	B-1	06 MAR 90
03-212-5	W-1	06 MAR 90

PARAMETER	03-212-1	03-212-2	03-212-3	03-212-4	03-212-5
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\*\* Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.



# Analytical Report

LOG NO: E90-03-212

Received: 07 MAR 90

Reported: 22 MAR 90

Ms. Donna Courington  
Brown and Caldwell  
3480 Buskirk Avenue  
Pleasant Hill, California 94523

Project: 5081-02

## REPORT OF ANALYTICAL RESULTS

Page 4

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED			
03-212-6	W-5				06 MAR 90
03-212-7	W-4				06 MAR 90
03-212-8	W-6				07 MAR 90
03-212-9	W-9				07 MAR 90
PARAMETER		03-212-6	03-212-7	03-212-8	03-212-9
<b>Purgeable Priority Pollutants</b>					
Date Extracted		03.14.90	03.14.90	03.14.90	03.15.90
1,1,1-Trichloroethane, ug/L		<20	<500	<20	<1
1,1,2,2-Tetrachloroethane, ug/L		<20	<500	<20	<1
1,1,2-Trichloroethane, ug/L		<20	<500	<20	<1
1,1-Dichloroethane, ug/L		<20	<500	<20	<1
1,1-Dichloroethene, ug/L		<20	<500	<20	<1
1,2-Dichloroethane, ug/L		<20	<500	<20	<1
1,2-Dichloropropane, ug/L		<20	<500	<20	<1
1,3-Dichloropropene, ug/L		<20	<500	<20	<1
2-Chloroethylvinylether, ug/L		<20	<500	<20	<1
2-Hexanone, ug/L		<20	<500	<20	<1
Acetone, ug/L		<20	400000	<200	<10
Acrolein, ug/L		<200	<5000	<200	<10
Acrylonitrile, ug/L		<200	<5000	<200	<10
Bromodichloromethane, ug/L		<20	<500	<20	<1
Bromomethane, ug/L		<20	<500	<20	<1
Benzene, ug/L		<20	<500	<20	<1
Bromoform, ug/L		<20	<500	<20	<1
Chlorobenzene, ug/L		<20	<500	<20	<1
Carbon Tetrachloride, ug/L		<20	<500	<20	<1
Chloroethane, ug/L		<20	<500	<20	<1
Chloroform, ug/L		<20	<500	<20	2
Chloromethane, ug/L		<20	<500	<20	<1

# Analytical Report

LOG NO: E90-03-212

Received: 07 MAR 90

Reported: 22 MAR 90

Ms. Donna Courington  
Brown and Caldwell  
3480 Buskirk Avenue  
Pleasant Hill, California 94523

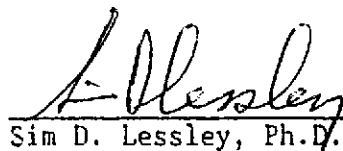
Project: 5081-02

## REPORT OF ANALYTICAL RESULTS

Page 5

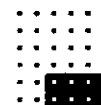
LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED			
03-212-6	W-5	06 MAR 90			
03-212-7	W-4	06 MAR 90			
03-212-8	W-6	07 MAR 90			
03-212-9	W-9	07 MAR 90			
PARAMETER	03-212-6	03-212-7	03-212-8	03-212-9	
Carbon Disulfide, ug/L	<20	<500	<20	<1	
Dibromochloromethane, ug/L	<20	<500	<20	<1	
Ethylbenzene, ug/L	<20	<500	<20	<1	
Freon 113, ug/L	<20	<500	<20	<1	
Methyl ethyl ketone, ug/L	<400	<1000	<400	<20	
Methyl isobutyl ketone, ug/L	<20	<500	<20	<1	
Methylene chloride, ug/L	<20	<500	<20	<1	
Styrene, ug/L	<20	<500	<20	<1	
Trichloroethene, ug/L	460	<500	280	21	
Trichlorofluoromethane, ug/L	<20	<500	<20	<1	
Toluene, ug/L	<20	1200	<20	<1	
Tetrachloroethene, ug/L	5600	<500	1700	13	
Vinyl acetate, ug/L	<20	<500	<20	<1	
Vinyl chloride, ug/L	190	<500	<20	<1	
Total Xylene Isomers, ug/L	<20	<500	<20	<1	
cis-1,2-Dichloroethene, ug/L	1900	<500	<20	<1	
trans-1,2-Dichloroethene, ug/L	<20	<500	<20	<1	
trans-1,3-Dichloropropene, ug/L	<20	<500	<20	<1	
Semi-Quantified Results **					
Methylethylacetate, ug/L	---	10000	---	---	

\*\* Quantification based upon comparison of total ion count of the compound with that of the nearest internal standard.

  
Sim D. Lessley, Ph.D., Laboratory Director

1255 Powell Street  
Emeryville, CA 94608

415/428-2300  
Fax: 415/547-3643

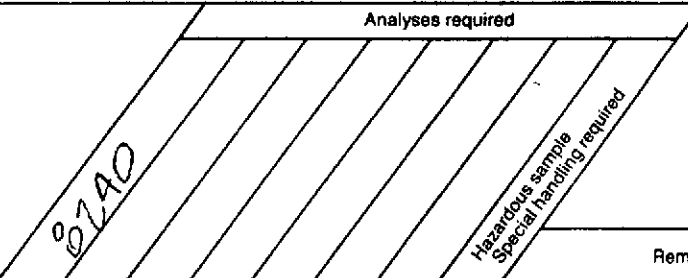


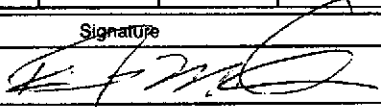
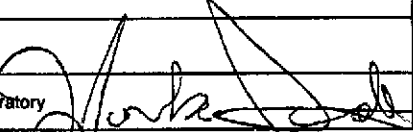
**BCA**

B C Analytical

**CHAIN OF CUSTODY RECORD**

BC Log Number \_\_\_\_\_

Client name <b>BC-P.H.</b>			Project or PO# <b>5081-02</b>			Analyses required 							
Address <b>3480 BUSKIRK AVE.</b>			Phone #										
City, State, Zip <b>PLEASANT HILL, CA 94523</b>			Report attention <b>DONNA COURINGTON</b>										
Lab Sample number	Date sampled	Time sampled	Type* See key below	Sampled by	Number of containers							Remarks	
				Sample description									
1	3-6		GW	K. McILVENNA, S. HALLOCK W-8 ✓		2	X						
2				W-7 ✓									
3				W-3 ✓									KEPT ON ICE
4				B-1 ✓									
5				W-1 ✓									
6				W-5 ✓									
7				W-4 ✓									
8				W-6 ✓									
9	3-7			W-9 ✓									

Signature	Print Name	Company	Date	Time
	KEVIN L. McILVENNA	BC-P.H.	3-7-90	
Received by				
Relinquished by				
Received by				
Relinquished by				
Received by Laboratory 	Monika Scott	BCA	3-7-90	

**BROWN AND CALDWELL LABORATORIES**

- 1255 Powell Street, Emeryville, CA 94608 (415) 428-2300
- 373 South Fair Oaks Avenue, Pasadena, CA 91105 (818) 795-7553
- 1200 Pacific Avenue, Anaheim, CA 92805

Note:  
 Samples are discarded 30 days after results are reported unless other arrangements are made.  
 Hazardous samples will be returned to client or disposed of at client expense.

\*KEY: AQ—Aqueous NA—Nonaqueous SL—Sludge GW—Groundwater SO—Soil OT—Other PE—Petroleum

ATTACHMENT C

LETTER FROM BCA  
DOCUMENTING REPORT ERROR



*B C Analytical*

April 20, 1990

Ms. Donna Courington  
Brown and Caldwell Consulting  
3480 Buskirk Avenue  
Pleasant Hill, California 94523-4342

Dear Ms. Courington:

Groundwater samples from your project 4459 were analyzed by BC Analytical (BCA) Emeryville laboratory in April and August of 1989. The data for the samples were reported under logs E89-04-609 and E89-08-375, with acetone as one of the contaminants detected in the samples by EPA 8240. Acetone was incorrectly reported as a semi-quantitatively detected compound in the reports. Acetone was calibrated with a five concentration level calibration and quantitatively determined.

Please make note of the error in our report format. If you have any questions, please call me at (415) 428-2300.

Very truly yours,

Chihsan Ho  
Client Services Representative, BCA

CH

cc: H. Ficklin, BCA

1255 Powell Street  
Emeryville, CA  
94608  
415/428-2300  
Fax: 415/547-3643

# Analytical Report

LOG NO: E90-07-036

Received: 03 JUL 90

Reported: 18 JUL 90

Ms. Donna Courington  
Brown and Caldwell  
3480 Buskirk Avenue  
Pleasant Hill, California 94523

Project: 5081

## REPORT OF ANALYTICAL RESULTS

Page 1

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
07-036-1	GS-9	03 JUL 90
PARAMETER	07-036-1	
Purgeable Priority Pollutants		
Date Analyzed		07.10.90
Date Extracted		07.10.90
Dilution Factor, Times		1
1,1,1-Trichloroethane, ug/L		<1
1,1,2,2-Tetrachloroethane, ug/L		<1
1,1,2-Trichloroethane, ug/L		<1
1,1-Dichloroethane, ug/L		<1
1,1-Dichloroethene, ug/L		<1
1,2-Dichloroethane, ug/L		<1
1,2-Dichloropropane, ug/L		<1
1,3-Dichloropropene, ug/L		<1
2-Chloroethylvinylether, ug/L		<1
Acrolein, ug/L		<10
Acrylonitrile, ug/L		<10
Bromodichloromethane, ug/L		<1
Bromomethane, ug/L		<1
Benzene, ug/L		<1
Bromoform, ug/L		<1
Chlorobenzene, ug/L		<1
Carbon Tetrachloride, ug/L		<1
Chloroethane, ug/L		<1
Chloroform, ug/L		<1
Chloromethane, ug/L		<1
Dibromochloromethane, ug/L		<1
Ethylbenzene, ug/L		<1
Methylene chloride, ug/L		<5

# Analytical Report

LOG NO: E90-07-036

Received: 03 JUL 90

Reported: 18 JUL 90

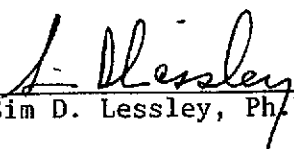
Ms. Donna Courington  
Brown and Caldwell  
3480 Buskirk Avenue  
Pleasant Hill, California 94523

Project: 5081

## REPORT OF ANALYTICAL RESULTS

Page 2

LOG NO	SAMPLE DESCRIPTION, GROUND WATER SAMPLES	DATE SAMPLED
07-036-1	GS-9	03 JUL 90
PARAMETER	07-036-1	
Trichloroethene, ug/L	160	
Trichlorofluoromethane, ug/L	<1	
Toluene, ug/L	<1	
Tetrachloroethene, ug/L	3	
Vinyl chloride, ug/L	<1	
cis-1,2-Dichloroethene, ug/L	3	
trans-1,2-Dichloroethene, ug/L	2	
trans-1,3-Dichloropropene, ug/L	<1	

  
Sim D. Lessley, Ph.D., Laboratory Director



