Chevron U.S.A. Inc.
2410 Camino Ramon, San Ramon, California • Phone (415) 842-9500
Mail Address: P.O. Box 5004, San Ramon, CA 94583-0804

90 NOV 14 PM 1:52

Marketing Operations

D. Moller
Manager, Operations
S. L. Patterson
Area Manager, Operations
C. G. Trimbach
Manager, Engineering

November 12, 1990

To: Dennis Byrne

From: Lisa Backlund

Re: Emeryville Update

The demolition contracts for the laboratory building have been awarded. Asbestos removal is expected to begin 11/19/90 and will be completed 11/22/90. The building demolition is to be scheduled.

Enclosed you will find the quarterly monitoring report by WGR for the second quarter of 1990. If you have any questions or require additional information, please contact me at (415) 842 - 9527.

WESTERN GEOLOGIC RESOURCES INC.

2169 E. FRANCISCO BLVD., SUITE B / SAN RAFAEL
CALIFORNIA 94901 / FAX 415.457.8521
TELE 415.457.7595

90 NOV 14 PM 1:52

22 August 1990

Ms. Lisa Marinaro
Chevron USA
2410 Camino Ramon
San Ramon, California 94583-0804

Re: Revised Quarterly Groundwater Monitoring
Sampled 19 June 1990
Abandoned Chevron Asphalt Plant and Terminal
1520 Powell Street
Emeryville, California
WGR Project #1-045.44

Dear Ms. Marinaro:

This letter report presents the results of the quarterly groundwater monitoring performed on 19 June 1990 by Western Geologic Resources, Inc. (WGR) at the subject site (Figures 1 and 2).

GROUNDWATER SAMPLING

On 19 June 1990, WGR staff measured depth-to-water in and purged groundwater from monitor wells MW-1 through MW-3, MW-7, MW-8 and MW-10 through MW-19. Wells MW-1 through MW-3, MW-7, MW-8 and MW-12 through MW-15 were purged dry before three well-casing volumes could be evacuated, and the wells were sampled after recovering to a minimum of 30% of their static water levels. Monitor well MW-9 has not been located since 7 July 1985 and wells MW-4 through MW-6 were removed during soil excavation in 1989. All groundwater samples were collected according to the WGR standard operating procedure for groundwater sampling included as Attachment A; field forms are included as Attachment B.

All purged water was temporarily stored on-site in 55-gallon drums pending analytic results. The groundwater samples and a laboratory-supplied travel blank, consisting of deionized water, were shipped under chain-of-custody to GTEL Environmental Laboratories, Inc. (GTEL) of Concord, California.

GROUNDWATER FLOW

Figure 2 shows the potentiometric surface of shallow groundwater, based on depth-to-water measurements taken on 19 June 1990. Groundwater elevation data are presented in Table 1. Hydrographs showing groundwater elevations over time are included as Attachment C. Average

groundwater flow direction for 19 June 1990 was to the south at a gradient of about 1%. Groundwater elevation data are presented in Table 1.

ANALYTIC RESULTS

Groundwater from all monitor wells sampled was analyzed for total purgeable petroleum hydrocarbons (TPPH) and for benzene, toluene, ethylbenzene and total xylenes (BTEX) by EPA Methods 8015 and 8020, respectively, and for purgeable halocarbons by EPA Method 601. In addition, wells MW-14 and MW-16 through MW-19 were analyzed for organic lead by EPA Method 7420. Analytic results for past sampling events and this round of sampling are presented in Tables 2 and 3. The chain-of-custody forms and laboratory reports with quality assurance/quality control documentation are included as Attachments D and E, respectively.

COMMENTS

Groundwater flow direction remains to the south at an approximate gradient of 1%. Analytic results have decreased slightly since the previous results from the 21 March 1990 sampling round.

Western Geologic Resources, Inc. is pleased to provide geologic and environmental consulting services for Chevron, and we trust that this report meets your needs. Please call us at (415) 457-7595 if you have any questions.

Sincerely,
Western Geologic Resources, Inc.

Christopher S. Alger
Project Geologist

CSA:va

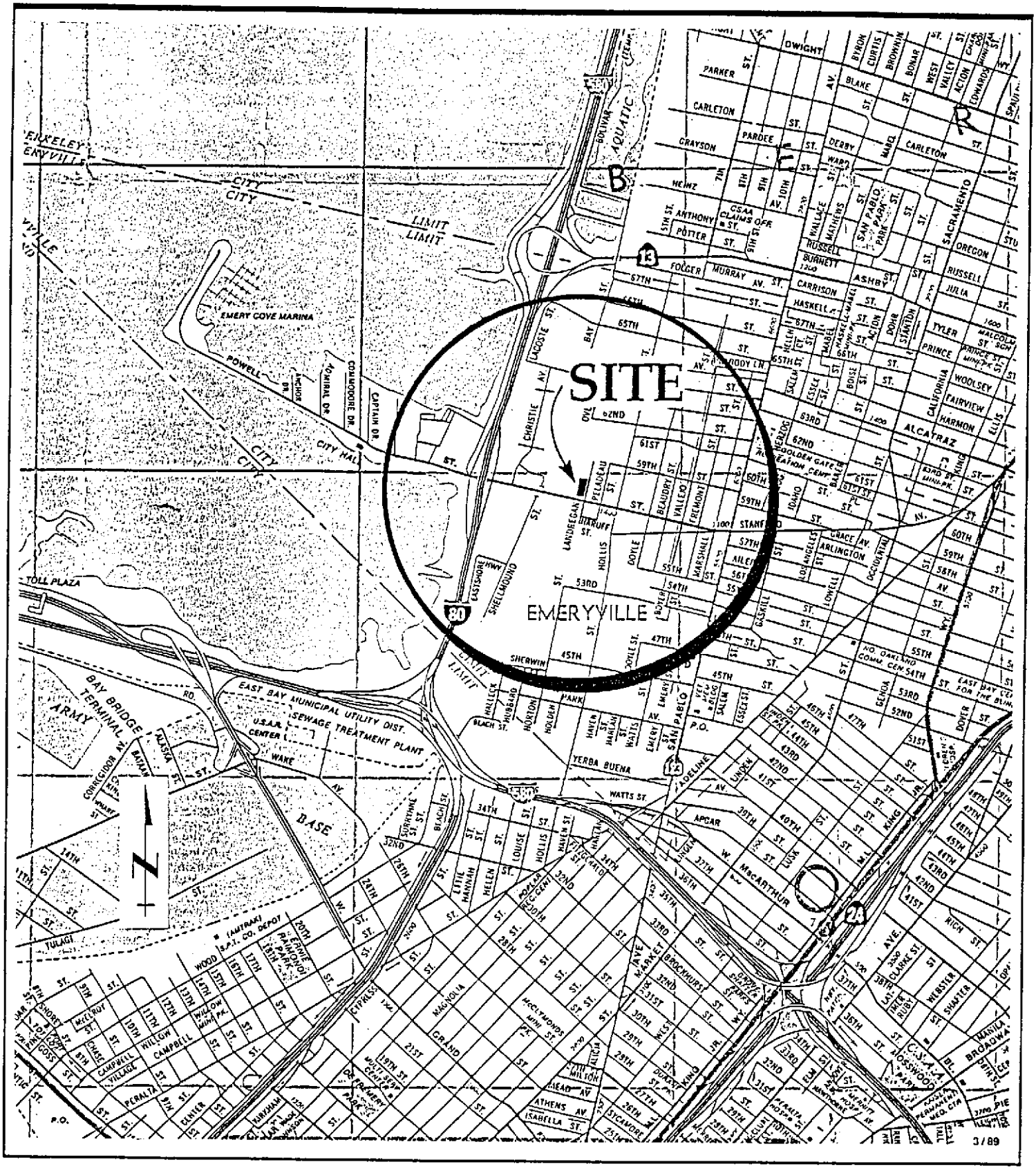
045Q1JE0.WP

FIGURES

TABLES

ATTACHMENTS

FIGURES



NOT TO SCALE

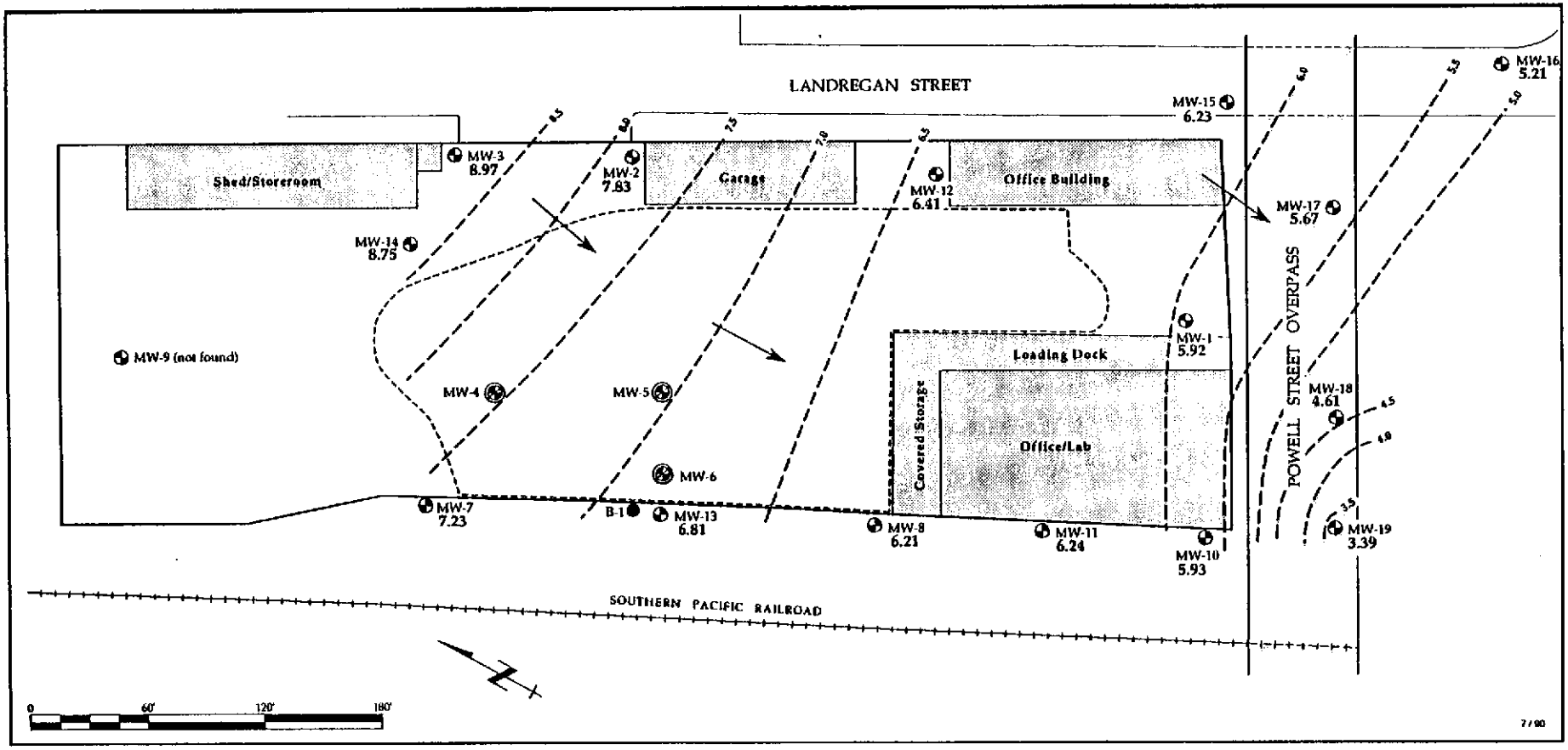
Road Map Reference: CSAA map of Oakland

Site Location Map
Former Chevron Ashpalt Plant and Terminal
Emeryville, California

FIGURE
1

WESTERN GEOLOGIC RESOURCES, INC.

1-045.44



LEGEND

MW-14	Monitor Well location
B-1	Soil boring location
MW-5	Destroyed or abandoned Monitor Well location
7.0	Groundwater elevation contour, feet above mean sea level, dashed where inferred
	Estimated direction of groundwater flow
	Boundary of excavation

Potentiometric Surface of Shallow Groundwater, 19 June 1990
Former Chevron Asphalt Plant and Terminal
Emeryville, California

FIGURE
2

Western Geologic Resources, Inc.

1-045.44

TABLES

TABLE 1. Groundwater Elevation Data
Abandoned Chevron Asphalt Plant and Terminal
Emeryville, California

Well ID #	Date	Rel.-TOC	TOC	DTW	Rel.-Elev.-W	Elev.-W
		<-----ft----->				
MW-1	13 Apr 89	98.56	10.67	3.72	94.84	6.95
MW-1	31 Jul 89	98.56	10.67	5.72	92.84	4.95
MW-1	8 Dec 89	98.56	10.67	4.80	93.76	5.87
MW-1	21 Mar 90	---	10.67	4.74	---	5.93
MW-1	19 Jun 90	---	10.67	4.75	---	5.92
MW-2	13 Apr 89	99.20	13.78	2.62	96.58	11.16
MW-2	31 Jul 89	99.20	13.78	4.63	94.57	9.15
MW-2	8 Dec 89	99.20	13.78	5.98	93.22	7.80
MW-2	21 Mar 90	---	13.78	5.85	---	7.93
MW-2	19 Jun 90	---	13.78	5.95	---	7.83
MW-3	13 Apr 89	99.50	11.73	2.34	97.16	9.39
MW-3	31 Jul 89	99.50	11.73	4.79	94.71	6.94
MW-3	8 Dec 89	99.50	11.73	3.03	96.47	8.70
MW-3	21 Mar 90	---	11.73	2.55	---	9.18
MW-3	19 Jun 90	---	11.73	2.76	---	8.97
MW-4*	13 Apr 89	99.86	---	2.12	96.74	---
MW-5*	13 Apr 89	98.53	---	2.79	95.74	---
MW-6*	13 Apr 89	99.03	---	1.90	97.13	---
MW-7	13 Apr 89	98.40	10.47	1.90	96.50	8.57
MW-7	31 Jul 89	98.40	10.47	4.24	94.16	6.23
MW-7	8 Dec 89	98.40	10.47	2.65	95.75	7.82
MW-7	21 Mar 90	---	10.47	2.76	---	7.71
MW-7	19 Jun 90	---	10.47	3.24	---	7.23
MW-8	13 Apr 89	98.31	10.46	2.80	95.51	7.66
MW-8	31 Jul 89	98.31	10.46	5.70	92.61	4.76
MW-8	8 Dec 89	98.31	10.46	4.13	94.18	6.33
MW-8	21 Mar 90	---	10.46	4.07	---	6.39
MW-8	19 Jun 90	---	10.46	4.25	---	6.21
MW-10	21 Mar 90	---	10.82	4.60	---	6.22
MW-10	19 Jun 90	---	10.82	4.89	---	5.93
MW-11	21 Mar 90	---	11.38	4.82	---	6.56
MW-11	19 Jun 90	---	11.38	5.14	---	6.24

1-045.44/G1MY0.WK1

TABLE 1. Groundwater Elevation Data (continued)
Abandoned Chevron Asphalt Pland and Terminal
Emeryville, California

Well ID #	Date	Rel.-TOC	TOC	DTW	Rel.-Elev.-W	Elev.-W
		<----------ft---------->				
MW-12	21 Mar 90	---	13.03	6.76	---	6.27
MW-12	19 Jun 90	---	13.03	6.62	---	6.41
MW-13	21 Mar 90	---	11.15	4.08	---	7.07
MW-13	19 Jun 90	---	11.15	4.34	---	6.81
MW-14	21 Mar 90	---	9.78	0.91	---	8.87
MW-14	19 Jun 90	---	9.78	1.03	---	8.75
MW-15	21 Mar 90	---	11.01	4.72	---	6.29
MW-15	19 Jun 90	---	11.01	4.78	---	6.23
MW-16	26 Mar 90	---	11.11	5.84	---	5.27
MW-16	19 Jun 90	---	11.11	5.90	---	5.21
MW-17	26 Mar 90	---	10.41	5.61	---	4.80
MW-17	19 Jun 90	---	10.41	---	---	---
MW-18	26 Mar 90	---	9.80	5.15	---	4.65
MW-18	19 Jun 90	---	9.80	5.19	---	4.61
MW-19	26 Mar 90	---	8.45	5.00	---	3.45
MW-19	19 Jun 90	---	8.45	5.06	---	3.39

NOTES:

Rel.-TOC = Relative Top-of-Casing elevation surveyed to temporary benchmark established at southwest corner of former totalizer, arbitrarily set at 100.00 ft above mean sea level. This TOC was used for reports prior to 21 March 1990

TOC = Top-of-Casing elevation as surveyed in April 1990, in feet above mean sea level. Back-calculated using TOC - DTW = Elev.-W to figure previous TOC's

DTW = Depth-to-Water

Rel.-Elev.-W = Relative Elevation of groundwater calculated by formula:
Rel. Elev-W = (Rel. - TOC) - DTW

Elev.-W = Elevation of groundwater

ft = feet

* = Monitor wells destroyed during soil excavation

--- = Not analyzed

Datum = Feet above mean sea level

1-045.44/G1MYO.WK1

TABLE 2. Analytic Results: Groundwater Samples
Former Chevron Asphalt Plant
Emeryville, California

Well ID #	Date	FC	O&G <-ppm->	TPH/TPPH	B	T	E	X	1,1-DCE	1,2-DCE	1,1-DCA	TCA	TCE	PCE	CF	VC	Other
				<-ppm->	<-ppb->												
MW-1	14 Apr 89	---	---	<5,000	34.0	<5.0	<5.0	<10.0	<5.0	739.0	<5.0	<5.0	11.0	---	---	340.0	I
MW-1	31 Jul 89	Gas	---	7,000	57.0	1.2	<0.2	1.6	6.8	2,654.0	2.7	7.2	57.0	---	---	760.0	II
MW-1	8 Dec 89	---	---	---	26.0	0.4	0.9	2.0	4.3	2,700.0	1.7	1.4	59.0	---	<0.5	520.0	---
MW-1	21 Mar 90	Gas	---	3,500	120.0	9.0	3.0	3.0	7.1	7,000.0	2.1	1.1	130.0	<0.5	<0.5	1100.0	---
MW-1	19 Jun 90	Gas	---	2,700	100.0	<0.3	<0.3	7.0	12.0	6,100.0	3.1	<0.5	81.0	<0.5	<0.5	1200.0	---
MW-2	14 Apr 89	---	<3.0	<100	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	---	---	<0.2	---
MW-2	31 Jul 89	---	---	<100	<0.2	<1.0	<0.2	<0.4	<0.2	<0.2	<0.4	0.5	<0.2	---	---	<0.2	---
MW-2	8 Dec 89	---	---	---	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	---	<0.5	<1.0	---
MW-2	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
MW-2	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
MW-3	14 Apr 89	---	<3.0	<100	<0.2	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2	<0.2	<0.2	---	---	<0.2	---
MW-3	31 Jul 89	---	---	<100	<0.2	<1.0	<0.2	<0.4	<0.2	<0.2	<0.4	0.5	<0.2	---	---	<0.2	---
MW-3	8 Dec 89	---	---	---	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	---	<0.5	<1.0	---
MW-3	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
MW-3	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
MW-4*	14 Apr 89	DSL 2	<3.0	380	<0.5	<1.0	<1.0	<1.0	<1.0	2.0	<1.0	<1.0	<1.0	---	---	<1.0	---
MW-4*	8 Dec 89	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-5*	14 Apr 89	DSL 2	<3.0	4,300	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	---
MW-5*	8 Dec 89	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-6*	14 Apr 89	DSL 2	<3.0	3,300	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	---
MW-6*	8 Dec 89	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
MW-7	14 Apr 89	---	<3.0	<50	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	---	---	<1.0	---
MW-7	31 Jul 89	DSL 2	---	160.0	<0.1	<0.5	<0.1	<0.2	<0.1	0.3	<0.1	4.5	<0.1	---	---	<0.1	III
MW-7D	31 Jul 89	DSL 2	---	100.0	<0.1	<0.5	<0.1	<0.1	<0.1	0.4	0.2	2.6	<0.1	---	---	<0.1	III
MW-7	8 Dec 89	---	---	---	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	0.67	<0.5	---	<0.5	<1.0	---
MW-7	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	0.6	<0.2	<0.5	<0.5	1.4	<0.5	<0.5	<0.5	<1.0	---
MW-7	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	0.67	<0.5	<0.5	<0.5	<1.0	---

TABLE 2. Analytic Results: Groundwater Samples (continued)
Former Chevron Asphalt Plant
Emeryville, California

Well ID #	Date	FC	O&G	TPH/TPPH	B	T	E	X	1,1-DCE	1,2-DCE	1,1-DCA	TCA	TCE	PCE	CF	VC	Other
			<-ppm->	<--------						ppb						------->	
MW-8	14 Apr 89	---	<3.0	<50	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	---	---	<1.0	---
MW-8	31 Jul 89	---	---	<50	<0.1	<0.5	<0.1	<0.2	<0.1	2.5	1.7	1.7	0.4	---	---	1.2	---
MW-8	8 Dec 89	---	---	---	<0.3	<0.3	<0.3	<0.6	<0.02	0.53	<0.5	0.89	<0.5	---	<0.5	<1.0	---
MW-8	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	0.96	<0.5	0.72	<0.5	<0.5	<0.5	<1.0	---
MW-8	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	0.59	<0.5	0.67	<0.5	<0.5	<0.5	<1.0	---
MW-10	14 Apr 89	---	<3.0	<50	<0.5	<1.0	<1.0	<1.0	<1.0	15.0	2.0	<1.0	5.0	---	---	<1.0	---
MW-10	31 Jul 89	---	---	<50	<0.1	<0.5	<0.1	<0.2	0.7	33.3	2.9	<0.1	5.3	---	---	<0.1	---
MW-10	8 Dec 89	---	---	---	<0.3	<0.3	<0.3	<0.6	<0.2	24.0	3.1	<0.5	4.9	---	0.6	<1.0	---
MW-10	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	0.7	30.0	2.5	<0.5	3.5	<0.5	<0.5	<1.0	---
MW-10	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	0.3	33.0	2.6	<0.5	6.3	<0.5	<0.5	<1.0	---
MW-11	14 Apr 89	---	<3.0	<50	<0.5	<1.0	<1.0	<1.0	1.0	120.0	<1.0	<1.0	4.0	---	---	10.0	---
MW-11	31 Jul 89	---	---	<100	<0.2	<0.2	<0.2	<0.2	0.9	150.0	2.2	1.4	2.9	---	---	<0.2	---
MW-11	8 Dec 89	---	---	---	<0.3	<0.3	<0.3	<0.6	0.5	120.0	2.1	1.2	4.1	---	<0.5	2.4	---
MW-11	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	1.3	150.0	1.2	1.7	3.5	<0.5	<0.5	4.3	IV
MW-11	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	0.68	140.0	1.3	<0.5	5.0	<0.5	<0.5	1.0	---
MW-12	14 Apr 89	---	<3.0	<50	<0.5	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	---	---	<1.0	---
MW-12	31 Jul 89	---	---	<100	<0.1	<0.5	<0.1	<0.2	<0.1	1.7	<0.1	<0.1	0.8	---	---	<0.1	---
MW-12	8 Dec 89	---	---	---	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	---	<0.5	<1.0	---
MW-12	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
MW-12	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
MW-13	21 Mar 90	---	---	480	<0.3	<0.3	1.0	5.0	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
MW-13	19 Jun 90	Gas	---	180	<0.3	<0.3	0.8	3.0	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
MW-14	21 Mar 90	---	---	170	<0.3	<0.3	0.4	2.0	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
MW-14	19 Jun 90	Gas	---	77	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
MW-15	21 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
MW-15	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---

TABLE 2. Analytic Results: Groundwater Samples (continued)
Former Chevron Asphalt Plant
Emeryville, California

Well ID #	Date	FC	O&G <-ppm->	TPH/TPPH	B	T	E	X	1,1-DCE	1,2-DCE	1,1-DCA	TCA	TCE	PCE	CF	VC	Other
				<-------						ppb						------>	
MW-16	26 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	0.8	<0.5	<0.5	27.0	8.0	2.0	<1.0	---
MW-16	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	35.0	7.7	2.0	<1.0	---
MW-17	26 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	5.2	0.7	1.3	32.0	11.0	1.1	<1.0	---
MW-17	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	3.1	<0.5	1.0	38.0	13.0	1.2	<1.0	---
MW-18	26 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	1.7	<0.5	2.4	33.0	20.0	0.9	<1.0	---
MW-18	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	2.7	<0.5	0.9	63.0	20.0	0.73	<1.0	---
MW-19	26 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	10.0	<0.5	2.5	41.0	53.0	3.2	<1.0	---
MW-19	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	13.0	<0.5	1.5	46.0	47.0	2.8	<1.0	---
TB	14 Apr 89	---	---	<50	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	---	---	<0.1	---
TB	31 Jul 89	---	---	<50	<0.1	<0.5	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	---	---	<0.1	---
TB	8 Dec 89	---	---	---	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	---	<0.5	<1.0	---
TB	21 Mar 90	---		<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
TB	26 Mar 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<1.0	---
TB	19 Jun 90	---	---	<50	<0.3	<0.3	<0.3	<0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---

NOTES:

FC = Fuel Characterization
O&G = Oil and Grease
TPH/TPPH = Total Petroleum Hydrocarbons/Total Purgeable Petroleum Hydrocarbons
B = Benzene
T = Toluene
E = Ethylbenzene
X = Total Xylenes
1,1-DCE = 1,1-Dichloroethene

1,2-DCE = cis- and trans-1,2-dichloroethene
1,1-DCA = 1,1-Dichloroethane
TCA = 1,1,1-Trichloroethane
TCE = Trichloroethene
PCE = Tetrachloroethene
CF = Chloroform
VC = Vinyl Chloride
ppm = parts-per-million
ppb = parts-per-billion

* = Destroyed monitor wells - 1989
TB = Travel Blank
--- = Not analyzed/not detected
< = Less than
I = 6 ppb 1,2-dichloropropane
II = 0.6 ppb 1,2-dichloroethane
III = 0.1 ppb 1,2-dichlorobenzene
IV = 1.8 ppb 1,2-dichloroethane
Gas = Gasoline
DSL 2 = Diesel #2

TABLE 3. Analytic Results: Groundwater Samples - Metals
Former Chevron Asphalt Plant
Emeryville, California

Well ID #	Date	Total Cadmium	Total Chromium	Total Lead	Total Zinc	Organic Lead
		<----------ppb---------->				
MW-13	21 Mar 90	<50	<100	<5.0	<100	---
MW-14	22 Mar 90	<50	<100	<5.0	<100	---
MW-14	19 Jun 90	---	---	---	---	<50
MW-15	21 Mar 90	<50	<100	<5.0	<100	---
MW-16	26 Mar 90	<50	6,600	45	540	---
MW-16	19 Jun 90	---	---	---	---	<50
MW-17	26 Mar 90	56	7,900	150	1,020	---
MW-17	19 Jun 90	---	---	---	---	<50
MW-18	26 Mar 90	340	20,000	140	5,900	---
MW-18	19 Jun 90	---	---	---	---	<50
MW-19	26 Mar 90	<50	1,600	30	420	---
MW-19	19 Jun 90	---	---	---	---	<50
TB	21 Mar 90	<50	<100	<5.0	<100	---
TB	26 Mar 90	<50	<100	<5.0	<100	---

NOTES:

ppb = parts-per-billion
TB = Travel Blank
--- = Not analyzed/not detected

ATTACHMENT A

SOP-4: GROUNDWATER PURGING AND SAMPLING

STANDARD OPERATING PROCEDURES
RE: GROUNDWATER PURGING AND SAMPLING
SOP-4

Prior to water sampling, each well is purged by evacuating a minimum of three well-casing volumes of groundwater or until the discharge water temperature, conductivity, and pH stabilize. The groundwater sample should be taken when the water level in the well recovers to 80% of its static level.

The sampling equipment used consists of either a teflon bailer or a stainless steel bladder pump with a teflon bladder. If the sampling system is dedicated to the well, then the bailer is made of teflon, but the bladder pump is PVC with a polypropylene bladder. Forty milliliter (ml) glass volatile-organic-analysis (VOA) vials, with teflon septa, are used as sample containers.

The groundwater sample is decanted into each VOA vial in such a manner that there is a meniscus at the top of the vial. The cap is quickly placed over the top of the vial and securely tightened. The VOA vial is then inverted and tapped to see if air bubbles are present. If none are present, the sample is labeled and refrigerated for delivery under chain-of-custody to the laboratory. Label information should include a sample identification number, job identification number, date, time, type of analysis requested, and the sampler's name.

For quality control purposes, a duplicate water sample is collected from each well. This sample is put on hold at the laboratory. A trip blank is prepared at the laboratory and placed in the transport cooler. It remains with the cooler and is analyzed by the laboratory along with the groundwater samples. A field blank is prepared in the field when sampling equipment is not dedicated. The field blank is prepared after a pump or bailer has been steam-cleaned, prior to use in a second well, and is analyzed along with the other samples. The field blank demonstrates the quality of in-field cleaning procedures to prevent cross-contamination.

To minimize the potential for cross-contamination between wells, all the well-development and water-sampling equipment that is not dedicated to a well is steam-cleaned between each well. As a second precautionary measure, wells will be sampled in order of least to highest concentrations as established by previous analyses.

ATTACHMENT B

FIELD SAMPLING AND MONITORING FORMS

LIQUID-LEVEL DATA SHEET

Project No.	Project Name	Date	Initials
1-045.44	Emeryville Asphalt	6/19/90	JK / DB

Well No.	HISTORIC DATA/DATE: DTLH	DTW	LHT	CURRENT DATA: in feet DTLH	DTW	LTH	METHOD WLP, PB, IP*	TIME	COMMENTS
MW-1					4.75		WLP	924	
MW-2					5.95			931	no notch, only black mark
3					2.76			934	
7					3.24			940	
8					4.25			946	
10					4.89			952	
11					5.14			949	
12					6.52			928	
13					4.34			943	
14					1.03			938	
15					4.78			1004	needs thermo well
16					5.90			1001	
17									unable to access well - covered by car
18					5.19			957	
19					5.06			955	
MW6									looks like a container
MW*									1 gal of used oil below
									MW 10 & MW11

* WLP = Water-Level Probe
PB = Product Bailer
IP = Interface Probe

WGR

WATER SAMPLING DATA Well Name MW-1 Date 6-19-90 Time 1105
Job Name EMERYVILLE Job Number 1-045.44 Initials MPE
WELL DATA: Well type M (M=monitoring well; Describe _____)
Depth to Water 4.75 ft.
Well Depth 11.33 ft. (spec.) Sounded Depth 11.37 ft.
Well Diameter 3 in. Date 6-19-90 Time 1110

EVACUATION: Sampling Equipment:
PVC Bailer: _____ in. Dedicated: Bladder Pump ✓ ;Bailer _____
Sampling Port:Number — Rate — gpm. Volume — gal.
Other _____
Initial Height of Water in Casing 6.62 ft; Volume 2.9 gal.
Volume To Be Evacuated = 7.3 gal. (initial volume x3 ✓, x4 _____)

	Evacuated	Evacuated	Evacuated
Time: Stop	1110	1125	
Start	1106	1121	
Total minutes	4	4	
Amount Evacuated	5.0	1.5	
Total Evacuated		gal.	
Evacuation Rate	1.25	gpm.	

formulas / conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
2" casing = 0.163 gal/ft
3" casing = 0.367 gal/ft
4" casing = 0.653 gal/ft
5" casing = 0.826 gal/ft
6" casing = 1.47 gal/ft
8" casing = 2.61 gal/ft

Depth to water during pumping — ft. — time
Pumped dry? YES After 5.0 gal. Recovery rate .07
Depth to water for 80% recovery 6.07 ft.

CHEMICAL DATA: Temp. Probe # ____ Ph Probe # ____ Cond. Probe # ____

SAMPLING: Point of collection: PE Hose ✓; End of bailer ___; Other _____
Samples taken 1605 time Depth to water 6.39 ft. Refrigerated: ✓
Sample description: Water color CLEAR Odor —
Sediment/Foreign matter —

Sample ID no.	Container VOA / other	Preservative HCl/NaHSO4/Azide/other	Analysis	Lab
061990-01A 40 ml		HCl	EPA 6.1 8015	G-TEL
13 ml		↓	↓	↓
4 ml		NONE	EPA 6.1	
D ml		↓	↓	
ml				
ml				
ml				
ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: DTW AFTER PUMPING DRY 10.50' @ 11:16:90
9.48' @ 11:16:90
47# @ 16.52 = 99% RECOVERY

96.37%

WGR

WATER SAMPLING DATA Well Name MW-2 Date 6-19-90 Time 0955
Job Name EMERYVILLE Job Number 1-045.64 Initials MPE
WELL DATA: Well type M (M=monitoring well; Describe _____)
Depth to Water 5.79 ft.
Well Depth 12.14 ft. (spec.) Sounded Depth 14.07 ft
Well Diameter 3 in. Date 6 19 90 Time 1011

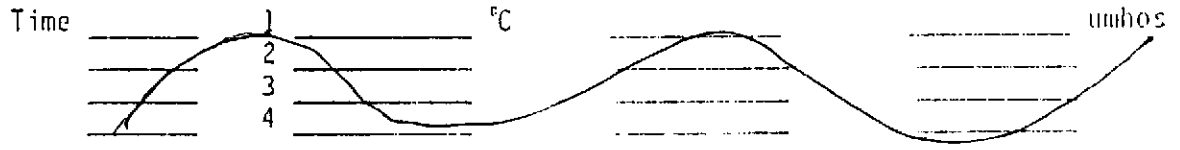
EVACUATION: Sampling Equipment:
PVC Bailer: _____ in. Dedicated: Bladder Pump ✓ ;Bailer _____
Sampling Port:Number _____ Rate _____ gpm. Volume _____ gal.
Other _____
Initial Height of Water in Casing ~~6.36~~ 8.29 ft; Volume ~~3~~ 5.0 gal.
Volume To Be Evacuated = ~~7.0~~ 9.1 gal. (initial volume x3 ✓, x4 _____)

	Evacuated	Evacuated	Evacuated
Time: Stop	1010	1024	
Start	1005	1023	
Total minutes			
Amount Evacuated	5.5	.5	
Total Evacuated	6 gal.		
Evacuation Rate	.85 gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
V_1" casing = 0.163 gal/ft
V_2" casing = 0.367 gal/ft
V_3" casing = 0.653 gal/ft
V_4" casing = 0.826 gal/ft
V_5" casing = 1.47 gal/ft
V_6" casing = 2.61 gal/ft

Depth to water during pumping — ft. — time
Pumped dry? YES After 5.5 gal. Recovery rate .03
Depth to water for 80% recovery 7.43 ft.

CHEMICAL DATA: Temp. Probe # ____ Ph Probe # ____ Cond. Probe # ____



SAMPLING: Point of collection: PE Hose ✓; End of bailer ___; Other _____
Samples taken 1546 time Depth to water 8.95 ft. Refrigerated: ✓
Sample description: Water color CLEAR Odor NONE
Sediment/Foreign matter PLANT FIBER

Sample ID no.		Container VOA / other	Preservative HCl/H2SO4/Azide/other	Analysis	Lab
061990-MW2A	40 ml		HCl	EPA 602/8015	G-TEL
B	40 ml		NONE	EPA 601	
C	40 ml				
D	40 ml				
	ml				
	ml				
	ml				
	ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: DTW AFTER PURGING DAY = 13.55 @ 10:11
12.93' @ 10:16
1.96' @ 15:42 = 73% RECOVERY

WGR

WATER SAMPLING DATA Well Name MW3 Date 6/19/90 Time 10:34
Job Name EMERYVILLE Job Number 1-045.44 Initials FRF
WELL DATA: Well type M (M=monitoring well; Describe)
Depth to Water 2.76 ft.
Well Depth 12.0 ft. (spec.)
Well Diameter 3 in.

Sounded Depth 11.95 ft.
Date 6/19/90 Time 10:38

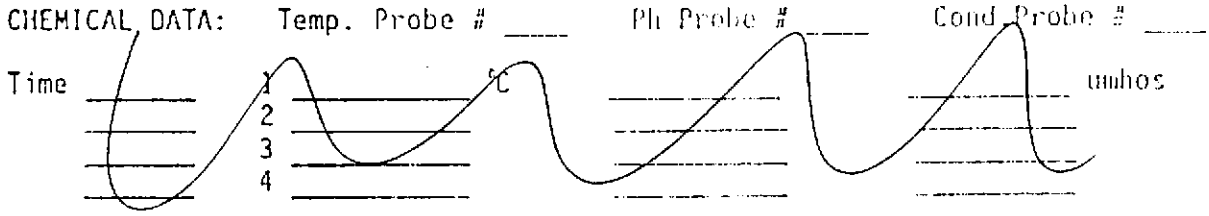
EVACUATION: Sampling Equipment:
PVC Bailer: in. Dedicated: Bladder Pump ✓ ;Bailer
Sampling Port:Number Rate gpm. Volume gal.
Other
Initial Height of Water in Casing 9.19 ft; Volume 3.4 gal.
Volume To Be Evacuated = 10.1 gal. (initial volume x3 ✓, x4)

	Evacuated	Evacuated	Evacuated
Time: Stop	10:45	10:58	
Start	10.39	10.56	
Total minutes	6 min	1	
Amount Evacuated	7.0 GAL	1 GAL	
Total Evacuated	gal.		
Evacuation Rate	1.17 gpm.		

formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
V_1" casing = 0.163 gal/ft
V_2" casing = 0.367 gal/ft
V_3" casing = 0.653 gal/ft
V_4" casing = 0.826 gal/ft
V_5" casing = 1.47 gal/ft
V_6" casing = 2.61 gal/ft

Depth to water during pumping - ft. - time .05
Pumped dry? YES After 7.0 gal. Recovery rate ~~1~~ GPM
Depth to water for 80% recovery 4.60 ft.

CHEMICAL DATA: Temp. Probe # Ph Probe # Cond. Probe #



SAMPLING: Point of collection: PF Hose ✓ ; End of bailer ; Other
Samples taken 1555 time Depth to water 5.11 ft. Refrigerated: ✓
Sample description: Water color CLEAR Odor —
Sediment/Foreign matter —

Sample ID no.			Container VOA / other	Preservative HCl/NaHSO₄/Azide/other	Analysis	Lab
061900	A	40 ml	✓	HCl	EPA 602/8015	GTEL
	B	ml				
	C	ml		NONE	EPA 601	
	D	ml				
		ml				
		ml				
		ml				
		ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: 10:45 PUMP DRY DTW @ 10:46 = 11.10
DTW @ 10:51 = 10:38

BLUE
DTW @ 15:52 = 5.10' = 1.640 gallons

963

WGR

WATER SAMPLING DATA Well Name MW-7 Date 6 19 90 Time 1205
Job Name EMERYVILLE Job Number 1-645.44 Initials MPF
WELL DATA: Well type M (M=monitoring well; Describe _____)
Depth to Water 3.24 ft.
Well Depth 13.59 ft. (spec.) Sounded Depth 13.57 ft.
Well Diameter 3 in. Date _____ Time _____

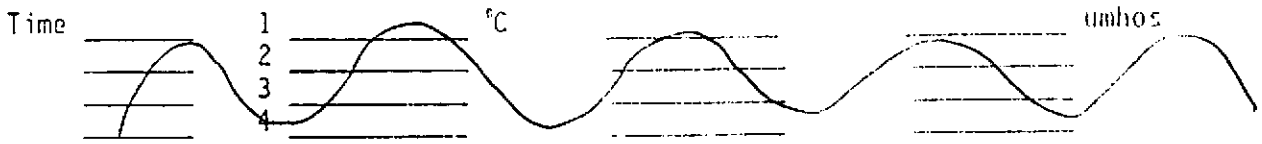
EVACUATION: Sampling Equipment:
PVC Bailer: _____ in. Dedicated: Bladder Pump ✓ ;Bailer _____
Sampling Port:Number _____ Rate _____ gpm. Volume _____ gal.
Other _____
Initial Height of Water in Casing 10.35 ft; Volume 3.4 gal.
Volume To Be Evacuated = 11.4 gal. (initial volume x3 ✓, x4 _____)

	Evacuated	Evacuated	Evacuated
Time: Stop	1200	1235	
Start	1211	1234	
Total minutes	9		
Amount Evacuated	11	.5	
Total Evacuated	11.5 gal.		
Evacuation Rate	1.2 gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V_8" casing = 2.61 gal/ft

Depth to water during pumping — ft. — time
Pumped dry? YES After 11.0 gal. Recovery rate .13
Depth to water for 80% recovery 5.31 ft.

CHEMICAL DATA: Temp. Probe # ____ Ph Probe # ____ Cond. Probe # ____



SAMPLING: Point of collection: PT Hose ✓; End of bailer ___; Other _____
Samples taken 1235 time Depth to water 10.20 ft. Refrigerated: ✓
Sample description: Water color BROWN Cloudy Odor —
Sediment/foreign matter VERY FINE SILTS

Sample ID no.	Container VOA / other	Preservative HgCl/HNO₃/Azide/other	Analysis	Lab
06196 01A 40 ml		HCl	EPA 8015 / 8.2	C-TEL
B 40 ml		↓	↓	
C 40 ml		HNO₃	EPA 6.1	
D 40 ml		↓	↓	
____ ____ ml				
____ ____ ml				
____ ____ ml				
____ ____ ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: DTW AFTER PUMPING OCT = 12.33' @ 12:21 PM
10.46' 12:26 PM

WGR

WATER SAMPLING DATA Well Name MW-8 Date 6-19-90 Time 1400
Job Name EMERYVILLE Job Number 1-045.44 Initials JDF
WELL DATA: Well type M (M=monitoring well; Describe _____)
Depth to Water 4.25 ft.
Well Depth 15.19 ft. (spec.) Sounded Depth _____ ft.
Well Diameter 3 in. Date _____ Time _____

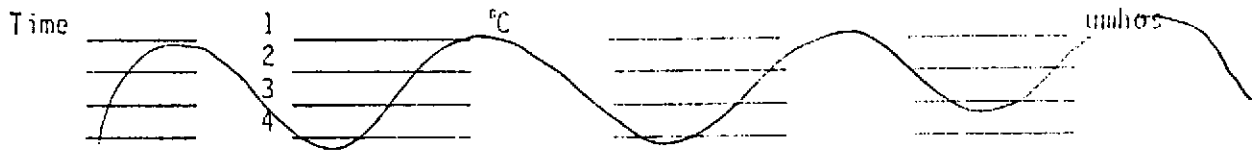
EVACUATION: Sampling Equipment:
PVC Bailer: _____ in. Dedicated: Bladder Pump ✓ ;Bailer _____
Sampling Port:Number _____ Rate _____ gpm. Volume _____ gal.
Other _____
Initial Height of Water in Casing 10.94 ft; Volume 4.0 gal.
Volume To Be Evacuated = 12.0 gal. (initial volume x3 ✓, x4 _____)

	Evacuated	Evacuated	Evacuated
Time: Stop	1410	1423	
Start	1401	1420	
Total minutes	9	3	
Amount Evacuated	9	3	
Total Evacuated	12 gal.		
Evacuation Rate	1 gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
¾" casing = 0.163 gal/ft
2" casing = 0.367 gal/ft
3" casing = 0.653 gal/ft
4" casing = 0.826 gal/ft
6" casing = 1.47 gal/ft
8" casing = 2.61 gal/ft

Depth to water during pumping — ft. — time
Pumped dry? YES After 9 gal. Recovery rate .2
Depth to water for 80% recovery 6.43 ft.

CHEMICAL DATA: Temp. Probe # ____ Ph Probe # ____ Cond.Probe # ____



SAMPLING: Point of collection: PE Hose ✓; End of bailer ___; Other _____
Samples taken 1435 time Depth to water 10.85 ft. Refrigerated: ✓
Sample description: Water color CLEAR Odor —
Sediment/Foreign matter —

Sample ID no.			Container (VOA) / other	Preservative HCl/H_2SO_4/Azide/other	Analysis	Lab
DCMC-DEA	40	ml		HCl	EPA 601/602	STL
	15	ml		↓	↓	
	6	ml		NONE	EPA 601	
	2	ml		↓	↓	
		ml				
		ml				
		ml				
		ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: PTW AFTER PUMPING DRY = 14.09' @ 14:10:45
11.33' @ 14:15:45

WGR

WATER SAMPLING DATA Well Name MW-10 Date 6-19-90 Time 14:45
Job Name EMERYVILLE Job Number 1-045.44 Initials DB
WELL DATA: Well type M (M=monitoring well; Describe _____)
Depth to Water 4.89 ft.
Well Depth 20.36 ft. (spec.) Sounded Depth — ft.
Well Diameter 4 in. Date — Time —

EVACUATION: Sampling Equipment:
PVC Bailer: _____ in. Dedicated: Bladder Pump ✓ ;Bailer _____
Sampling Port:Number _____ Rate _____ gpm. Volume _____ gal.
Other _____
Initial Height of Water in Casing 15.47 ft; Volume 10.10 gal.
Volume To Be Evacuated = 30.30 gal. (initial volume x3 ✓, x4 _____)

	Evacuated	Evacuated	Evacuated
Time: Stop	1632		
Start	~~1545~~ 1545		
Total minutes	47		
Amount Evacuated	31		
Total Evacuated	31 gal.		
Evacuation Rate	.659 gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
2" casing = 0.163 gal/ft
3" casing = 0.367 gal/ft
4" casing = 0.653 gal/ft
5" casing = 0.826 gal/ft
6" casing = 1.47 gal/ft
8" casing = 2.61 gal/ft

Depth to water during pumping — ft. — Time
Pumped dry? NO After — gal. Recovery rate _____
Depth to water for 80% recovery _____ ft.

CHEMICAL DATA: Temp. Probe # _____ Ph Probe # _____ Cond. Probe # _____

SAMPLING: Point of collection: PF Hose ✓; End of bailer ___; Other _____
Samples taken 16:32 time Depth to water 8.81 ft. Refrigerated: YES
Sample description: Water color Clear Odor NONE
Sediment/foreign matter NONE

Sample ID no.		Container VOA / other	Preservative HCl/H2SO4/Azide/other	Analysis	Lab
06190-10A	40 ml	VOA	HCl	EPA 602/8015	GTEL
B	40 ml	↓	↓	EPA 602/8015	↓
C	40 ml	↓	NONE	EPA 601	
D	40 ml	↓	↓	↓	
	ml				
	ml				
	ml				
	ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: (a) 1633 8.81 DTW

WGR

WATER SAMPLING DATA Well Name MW-11 Date 6/14/10 Time 1450
Job Name EMERYVILLE Job Number 1-645.44 Initials DB
WELL DATA: Well type M (M=monitoring well; Describe _____)
Depth to Water 5.14 ft.
Well Depth 19.43 ft. (spec.) Sounded Depth _____ ft.
Well Diameter 4 in. Date _____ Time _____

EVACUATION: Sampling Equipment:
PVC Bailer: _____ in. Dedicated: Bladder Pump ✓ ; Bailer _____
Sampling Port: Number _____ Rate _____ gpm. Volume _____ gal.
Other _____
Initial Height of Water in Casing 14.29 ft; Volume 9.33 gal.
Volume To Be Evacuated = 27.99 gal. (initial volume x3 ✓, x4 _____)

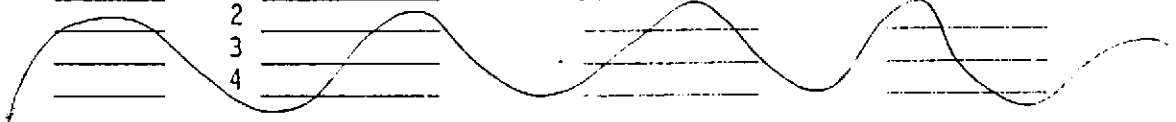
	Evacuated	Evacuated	Evacuated
Time: Stop	1523		
Start	1450		
Total minutes	33		
Amount Evacuated			
Total Evacuated	29 gal.		
Evacuation Rate	.87 gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
V_4" casing = 0.163 gal/ft
V_2" casing = 0.367 gal/ft
(3)" casing = 0.653 gal/ft
V_4" casing = 0.826 gal/ft
V_1" casing = 1.47 gal/ft
V_2" casing = 2.61 gal/ft

Depth to water during pumping _____ ft. _____ time
Pumped dry? NO After _____ gal. Recovery rate _____
Depth to water for 80% recovery _____ ft.

CHEMICAL DATA: Temp. Probe # ____ Ph Probe # ____ Cond. Probe # ____

Time _____ 1 _____ °C _____ umhos
2
3
4



SAMPLING: Point of collection: PT Hose ✓; End of bailer ___; Other _____
Samples taken 1523 time Depth to water 13.91 ft. Refrigerated: ✓
Sample description: Water color CLEAR Odor NONE
Sediment/Foreign matter NONE

Sample ID no.		Container VOA / other	Preservative HCl/H2SO4/Azide/other	Analysis	Lab
06190-11A	40 ml	VOA	HCl	EPA 602/8015	GTEL
B	40 ml	↓	↓	↓	↓
C	40 ml	↓	None	EPA 601	↓
D	40 ml	↓	↓	↓	↓
	ml				
	ml				
	ml				
	ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: DTW after Sample 13.91 @ 1523

WGR

WATER SAMPLING DATA Well Name MW12 Date 6/19/90 Time 11:35
Job Name EMERYVILLE Job Number 1-045.44 Initials EPE
WELL DATA: Well type M (M=monitoring well; Describe _____)
Depth to Water 6.62 ft.
Well Depth 19.21 ft. (spec.)
Well Diameter 4 in.

Sounded Depth 19.25 ft.
Date 6/19/90 Time 11:37

EVACUATION: Sampling Equipment:
PVC Bailer: _____ in. Dedicated: Bladder Pump ✓ ;Bailer _____
Sampling Port:Number _____ Rate _____ gpm. Volume _____ gal.
Other _____
Initial Height of Water in Casing 12.63 ft; Volume 8.25 gal.
Volume To Be Evacuated = 24.7 gal. (initial volume x3 ✓, x4 _____)

	Evacuated	Evacuated	Evacuated
Time: Stop	1145	1157	
Start	1135	1155	
Total minutes	10 MIN	2 MIN	
Amount Evacuated	11 GAL	2 GAL	
Total Evacuated		gal.	
Evacuation Rate	1.08	gpm.	

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
V_1" casing = 0.163 gal/ft
V_2" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V_8" casing = 2.61 gal/ft

Depth to water during pumping _____ ft. _____ time .3
Pumped dry? YES After 11 gal. Recovery rate [illegible]
Depth to water for 80% recovery 10.10 ft.

CHEMICAL DATA: Temp. Probe # _____ Ph Probe # _____ Cond Probe # _____

Time		°C		umhos
	1			
	2			
	3			
	4			

SAMPLING: Point of collection: PT Hose ✓; End of bailer _____; Other _____
Samples taken 1613 time Depth to water ~~6.64~~ 9.85 ft. Refrigerated: ✓
Sample description: Water color CLEAR Odor —
Sediment/Foreign matter _____

Sample ID no.			Container (VOA) / other	Preservative HCl/H2SO4/Azide/other	Analysis	Lab
0619	12A40	40 ml	40	HCL	EPA602/8015	GTEL
	B	ml				
D	C	ml		NONE	EPA 601	
	D	ml				
		ml				
		ml				
		ml				
		ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: PUMPED DRY DTW 18.11 @ 11:45:45
15.89 @ 11:50:45
6.69 @ 16 CM = 99% RECOVERY

WGR

WATER SAMPLING DATA Well Name MW-13 Date 6/19/90 Time 11:28
Job Name Emeryville Job Number 1-045.44 Initials JC
WELL DATA: Well type ___ (M=monitoring well; Describe —)
Depth to Water 4.34 ft.
Well Depth 12.5 ft. (spec.) Sounded Depth — ft.
Well Diameter 4 in. Date — Time —

EVACUATION: Sampling Equipment:
PVC Bailer: 3, 1.5 in. Dedicated: Bladder Pump — ;Bailer —
Sampling Port:Number — Rate — gpm. Volume — gal.
Other —
Initial Height of Water in Casing 8.16 ft; Volume 5.3 gal.
Volume To Be Evacuated = 16 gal. (initial volume x3 ✓, x4 ___)

	Evacuated	Evacuated	Evacuated
Time: Stop	1139		
Start	1129		
Total minutes	10		
Amount Evacuated	11		
Total Evacuated	11 gal.		
Evacuation Rate	1.1 gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
V₁" casing = 0.163 gal/ft
V₂" casing = 0.367 gal/ft
V₄" casing = 0.653 gal/ft
V₅" casing = 0.826 gal/ft
V₆" casing = 1.47 gal/ft
V₈" casing = 2.61 gal/ft

Depth to water during pumping — ft. — time
Pumped dry? yes After 11 gal. Recovery rate .06
Depth to water for 80% recovery 5.67 ft.

CHEMICAL DATA: Temp. Probe # ___ Ph Probe # ___ Cond. Probe # ___

Time		Temp °C	Ph	Cond. umhos
	1			
	2			
	3			
	4			

SAMPLING: Point of collection: PE Hose ___; End of bailer ✓; Other ___
Samples taken 1553 time Depth to water 4.92 ft. Refrigerated: yes
Sample description: Water color clear Odor —
Sediment/Foreign matter —

Sample ID no.			Container VOA / other	Preservative NaHSO₄/Azide/other	Analysis	Lab
061990 13 A		40 ml		HCl	EPA 601/8015	Gtel
	B	ml		↓	↓	
	C	ml		None	602	
	D	ml		↓	↓	
		ml				
		ml				
		ml				
		ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: DTW = 14.47 at 1139
13.97 at 1144
4.71 at 1540 - 95% Recovered for Sampling

WGR

WATER SAMPLING DATA Well Name MW-14 Date 6/19/90 Time 11:00
Job Name EMERYVILLE Job Number 1-045.44 Initials SD/TR/KF
WELL DATA: Well type ____ (M=monitoring well; Describe ____)
Depth to Water 1.03 ft.
Well Depth 10.0 ft. (spec.) Sounded Depth — ft.
Well Diameter 4 in. Date — Time —

EVACUATION: Sampling Equipment:
PVC Bailer: 3, 1.5 in. Dedicated: Bladder Pump ____ ;Bailer ____
Sampling Port: Number — Rate — gpm. Volume — gal.
Other
Initial Height of Water in Casing 8.97 ft; Volume 5.85 gal.
Volume To Be Evacuated = 17.6 gal. (initial volume x3 ___, x4 ___)

	Evacuated	Evacuated	Evacuated
Time: Stop	11:11		
Start	11:02		
Total minutes	9		
Amount Evacuated	8		
Total Evacuated		gal.	
Evacuation Rate	.88	gpm.	

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
V_1" casing = 0.163 gal/ft
V_2" casing = 0.367 gal/ft
V_3" casing = 0.653 gal/ft
V_4" casing = 0.826 gal/ft
V_5" casing = 1.47 gal/ft
V_6" casing = 2.61 gal/ft

Depth to water during pumping — ft. — time
Pumped dry? YES After 8 gal. Recovery rate .018
Depth to water for 80% recovery 2.82 ft.

CHEMICAL DATA: Temp. Probe # ___ Ph Probe # ___ Cond. Probe # ___

Time		°C		umhos
	1			
	2			
	3			
	4			

SAMPLING: Point of collection: PE Hose ___; End of bailer ✓; Other ____
Samples taken 1011 time Depth to water 6.65 ft. Refrigerated: YES
Sample description: Water color Clear Odor —
Sediment/Foreign matter —

Sample ID no.			Container VOA / other	Preservative NaHSO₄/Azide/other	Analysis	Lab
06190-14A	40	ml	VOA	HCL	EPA 601/8010	GETEL
B		ml		HCL	↓	
C		ml		NONE	602	
D		ml	↓	↓	↓	
E	1000	ml	BOTTLE		ORGANIC LEAD	
		ml				
		ml				
		ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: DTW - 9.49 @ 11:12
9.35 @ 11:17
6.36 at 16:04 = 40 % Recovered for Sampling

WGR

WATER SAMPLING DATA Well Name MW -15 Date 6/19/90 Time 11:03
Job Name EMERYVILLE Job Number 1-045.44 Initials DB, SK
WELL DATA: Well type M (M=monitoring well; Describe)
Depth to Water 4.78 ft.
Well Depth 10.5 ft. (spec.) Sounded Depth — ft.
Well Diameter 4 in. Date — Time —

EVACUATION: Sampling Equipment:
PVC Bailer: 3 1.5 in. Dedicated: Bladder Pump ;Bailer
Sampling Port:Number — Rate — gpm. Volume — gal.
Other
Initial Height of Water in Casing 5.72 ft; Volume 3.73 gal.
Volume To Be Evacuated = 11.2 gal. (initial volume x3 ✓, x4)

	Evacuated	Evacuated	Evacuated
Time: Stop	12:12		
Start	11:05		
Total minutes	17		
Amount Evacuated	5.5		
Total Evacuated	gal.		
Evacuation Rate	.32 gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V_8" casing = 2.61 gal/ft

Depth to water during pumping — ft. — time
Pumped dry? yes After 5.5 gal. Recovery rate 0.056 GPM
Depth to water for 80% recovery 5.92 ft.

CHEMICAL DATA: Temp. Probe # ___ Ph Probe # ___ Cond. Probe # ___

Time		Temp. °C	Ph	Cond. umhos
	1			
	2			
	3			
	4			

SAMPLING: Point of collection: PE Hose ___; End of bailer ✓; Other
Samples taken 1444 time Depth to water 5.62 ft. Refrigerated: yes
Sample description: Water color clear Odor —
Sediment/Foreign matter —

Sample ID no.		Container VOA / other	Preservative NaHSO$_4$/Azide/other	Analysis	Lab
06190-15A	40 ml	↓	HCl	EPA 602/8015	G-tel
B	ml		↓	↓	↓
C	ml		None	601	
D	ml		↓	↓	
[illegible]	[illegible] ml	[illegible]	↓	~~[illegible]~~	↓
	ml				
	ml				
	ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: DW = 9.72 at 12:13 .43
DTW 9.29 @ 12:18
5.45 @ 14:33 = 88% RECOVERED FOR SAMPLED

WGR

WATER SAMPLING DATA Well Name MW 16 Date 6/19/90 Time 1510
Job Name EMERYVILLE Job Number 1-045.49 Initials JK/KF
WELL DATA: Well type M (M=monitoring well; Describe _____)
Depth to Water 5.90 ft.
Well Depth 13.34 ft. (spec.) Sounded Depth — ft.
Well Diameter 2 in. Date — Time —

EVACUATION: Sampling Equipment:
PVC Bailer: 1.5 in. Dedicated: Bladder Pump — ; Bailer —
Sampling Port: Number — Rate — gpm. Volume — gal.
Other —
Initial Height of Water in Casing 7.44 ft; Volume 1.21 gal.
Volume To Be Evacuated = 3.63 gal. (initial volume x3 /, x4)

	Evacuated	Evacuated	Evacuated
Time: Stop	1520		
Start	1512		
Total minutes	8		
Amount Evacuated	3.75		

Total Evacuated 3.75 gal.
Evacuation Rate .46 gpm.

Formula: / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
2" casing = 0.163 gal/ft
3" casing = 0.367 gal/ft
4" casing = 0.653 gal/ft
4.5" casing = 0.826 gal/ft
6" casing = 1.47 gal/ft
8" casing = 2.61 gal/ft

Depth to water during pumping — ft. — time
Pumped dry? No After — gal. Recovery rate —
Depth to water for 80% recovery — ft.

CHEMICAL DATA: Temp. Probe # — pH Probe # — Cond. Probe #

Time		Temp. °C	pH	Cond. umhos
	1			
	2			
	3			
	4			

SAMPLING: Point of collection: PE Hose ; End of bailer ; Other
Samples taken 1527 time Depth to water — ft. Refrigerated:
Sample description: Water color — Odor —
Sediment/Foreign matter —

Sample ID no.		Container VOA / other	Preservative HCl/HNO₃/Azide/other	Analysis	Lab
CG190-16A	40 ml	VOA	HCl	EPA 602/8015	GTEL
CG190-16B	ml				
C	ml		NONE	601	
D	ml				
E	ml	BOTTLE		ORGANIC LEAD	
	ml				
	ml				
	ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: —

WGR

WATER SAMPLING DATA Well Name MW-17 Date 6-19-90 Time 1440
Job Name EMERYVILLE Job Number 1-045.44 Initials KF
WELL DATA: Well type M (M=monitoring well; Describe _____)
Depth to Water 5.67 ft.
Well Depth 12 ft. (spec.) ~~Sounded Depth~~ DTW 5.67 ft.
Well Diameter 2 in. Date 6/19/90 Time 1408

EVACUATION: Sampling Equipment:
PVC Bailer: 1.5" in. Dedicated: Bladder Pump — ;Bailer —
Sampling Port: Number — Rate — gpm. Volume — gal.
Other —
Initial Height of Water in Casing 6.33 ft; Volume 1.03 gal.
Volume To Be Evacuated = 3.09 gal. (initial volume x3 ✓, x4 ____)

	Evacuated	Evacuated	Evacuated
Time: Stop	1445		
Start	1438		
Total minutes	7		
Amount Evacuated	3 GAL		
Total Evacuated	3 GAL gal.		
Evacuation Rate	.43 gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
V_{2}" casing = 0.163 gal/ft
V_{3}" casing = 0.367 gal/ft
V_{4}" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_{6}" casing = 1.47 gal/ft
V_{8}" casing = 2.61 gal/ft

Depth to water during pumping ____ ft. ____ time
Pumped dry? No After ____ gal. Recovery rate ____
Depth to water for 80% recovery ____ ft.

CHEMICAL DATA: Temp. Probe # ___ Ph Probe # ___ Cond. Probe # ___

Time		°C	umhos
	1		
	2		
	3		
	4		

SAMPLING: Point of collection: PE Hose ___; End of bailer ✓; Other ____
Samples taken 1450 time Depth to water 5.66 ft. Refrigerated: yes
Sample description: Water color LT. BROWN Odor —
Sediment/Foreign matter FINE SILT

Sample ID no.			Container VOA / other	Preservative $NaHSO_4$/Azide/other	Analysis	Lab
061990-17A	40	ml		HCl	EPA 602/8015	G Tech
B	1	ml		↓	↓	
C	↓	ml		N_2	601	
D	↓	ml		↓	↓	
E	1000	ml	Bottle	↓	Organic Lead	↓
		ml				
		ml				
		ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: _____

WGR

WATER SAMPLING DATA Well Name MW-18 Date 6/19/90 Time 1405
Job Name Emeryville Job Number 1-045.4 Initials KF
WELL DATA: Well type M (M=monitoring well; Describe -)
Depth to Water 5.19 ft.
Well Depth 11 ft. (spec.) Sounded Depth - ft.
Well Diameter 2 in. Date - Time -

EVACUATION: Sampling Equipment:
PVC Bailer: 1.5 in. Dedicated: Bladder Pump - ;Bailer -
Sampling Port:Number - Rate - gpm. Volume - gal.
Other -
Initial Height of Water in Casing 5.81 ft; Volume .94 gal.
Volume To Be Evacuated = 2.84 gal. (initial volume x3 ✓, x4 ___)

	Evacuated	Evacuated	Evacuated
Time: Stop	1415		
Start	1410		
Total minutes	5		
Amount Evacuated	3		
Total Evacuated	3 gal.		
Evacuation Rate	.6 gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V_8" casing = 2.61 gal/ft

Depth to water during pumping ___ ft. ___ time
Pumped dry? no After ___ gal. Recovery rate ___
Depth to water for 80% recovery ___ ft.

CHEMICAL DATA: Temp. Probe # ___ Ph Probe # ___ Cond.Probe # ___

Time		°C		umhos
	1			
	2			
	3			
	4			

SAMPLING: Point of collection: PE Hose ___; End of bailer ✓; Other ___
Samples taken 1420 time Depth to water 5.21 ft. Refrigerated: yes
Sample description: Water color BROWN Odor —
Sediment/Foreign matter FINE SILT

Sample ID no.		Container VOA / other	Preservative NaHSO₄/Azide/other	Analysis	Lab
0690-18 A	40 ml	VOA	HCl	EPA 602/8015	G-tel
B	ml	↓	↓	↓	↓
C	ml	↓	Azide	601	↓
D	ml	↓	↓	↓	↓
E	1000 ml	B, H₂ E	↓	Organic Lead	↓
	ml				
	ml				
	ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS:

WGR

WATER SAMPLING DATA Well Name MW-19 Date 6/19/90 Time 1225
Job Name Emeryville Job Number 1-045.14 Initials JK
WELL DATA: Well type M (M=monitoring well; Describe —)
Depth to Water 5.06 ft.
Well Depth 9 ft. (spec.) Sounded Depth — ft.
Well Diameter 2 in. Date — Time —

12:49

EVACUATION: Sampling Equipment:
PVC Bailer: 1.5 in. Dedicated: Bladder Pump — ;Bailer —
Sampling Port:Number — Rate — gpm. Volume — gal.
Other —
Initial Height of Water in Casing 3.94 ft; Volume .72 gal.
Volume To Be Evacuated = 2.16 gal. (initial volume x3 ___, x4 ___)

	Evacuated	Evacuated	Evacuated
Time: Stop	1237		
Start	1231		
Total minutes	6		
Amount Evacuated	2.2		
Total Evacuated	gal.		
Evacuation Rate	1.36 gpm.		

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
V_2" casing = 0.163 gal/ft
V_3" casing = 0.367 gal/ft
V_4" casing = 0.653 gal/ft
$V_{4.5}$" casing = 0.826 gal/ft
V_6" casing = 1.47 gal/ft
V_8" casing = 2.61 gal/ft

Depth to water during pumping ___ ft. ___ time
Pumped dry? No After ___ gal. Recovery rate ___
Depth to water for 80% recovery ___ ft.

CHEMICAL DATA: Temp. Probe # ___ Ph Probe # ___ Cond. Probe # ___

Time		°C		umhos
	1			
	2			
	3			
	4			

SAMPLING: Point of collection: PE Hose ___; End of bailer ✓; Other ___
Samples taken 12:49 time Depth to water 5.21 ft. Refrigerated: y/n
Sample description: Water color Brown Odor —
Sediment/Foreign matter Sediment

Sample ID no.		Container VOA / other	Preservative $NaHSO_4$/Azide/other	Analysis	Lab
061990-19 A	40 ml	VOA	HCl	EPA 601/8015	G tel
B	ml		None	HOI	
C	ml				
D	ml	Bottle		Organic lead	
E	1000 ml				
	ml				
	ml				
	ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

COMMENTS: ___

WGR

WATER SAMPLING DATA Well Name Travel blanks Date 6/17/10 Time 1200
Job Name Pinnacle Job Number 1-045.44 Initials JK
WELL DATA: Well type ____ (M=monitoring well; Describe ____)
Depth to Water ____ ft.
Well Depth ____ ft. (spec.) Sounded Depth ____ ft.
Well Diameter ___ in. Date ____ Time ____

EVACUATION: Sampling Equipment:
PVC Bailer: ____ in. Dedicated: Bladder Pump ____ ;Bailer ____
Sampling Port Number ____ Rate ____ gpm. Volume ____ gal.
Other ____
Initial Height of Water in Casing ____ ft; Volume ____ gal.
Volume To Be Evacuated = ____ gal. (initial volume x3 ___, x4 ____)

	Evacuated	Evacuated	Evacuated
Time: Stop			
Start			
Total minutes			
Amount Evacuated			

Total Evacuated ____ gal.
Evacuation Rate ____ gpm.

Formulas / Conversions
r = well radius in ft
h = ht of water col in ft
vol. of col. = $\pi r^2 h$
7.48 gal/ft³
¾" casing = 0.163 gal/ft
1" casing = 0.367 gal/ft
1¼" casing = 0.653 gal/ft
1½" casing = 0.826 gal/ft
2" casing = 1.47 gal/ft
3" casing = 2.61 gal/ft

Depth to water during pumping ____ ft. ____ time
Pumped dry? ____ After ____ gal. Recovery rate ____
Depth to water for 80% recovery ____ ft.

CHEMICAL DATA: Temp. Probe # ___ Ph Probe # ___ Cond.Probe # ___

Time		°C		umhos
____	1 ____	____	____	____
____	2 ____	____	____	____
____	3 ____	____	____	____
____	4 ____	____	____	____

SAMPLING: Point of collection: PE Hose ___; End of bailer ___; Other ____
Samples taken 1200 time Depth to water ____ ft. Refrigerated: yes
Sample description: Water color ____ Odor ____
Sediment/Foreign matter ____

Sample ID no.			Container VOA / other	Preservative $NaHSO_4$/Azide/other	Analysis	Lab
061910-20	40	ml	↓	—	EPA 602/8015 GRO	CTEL
↓	↓	ml	↓	—		
		ml				
		ml				
		ml				
		ml				
		ml				
		ml				

Container codes: P = plastic bottle; C or B = clear/brown glass; Describe

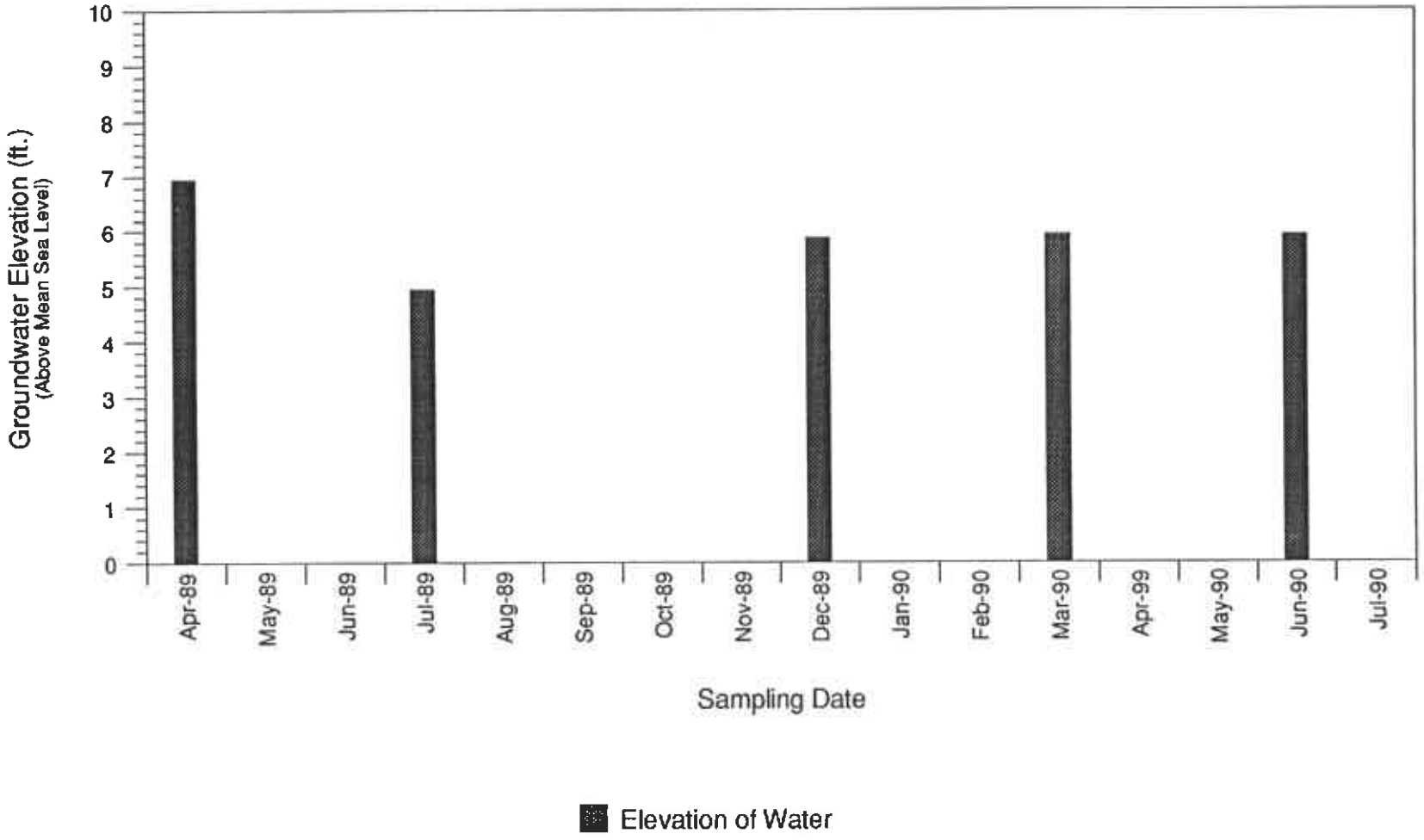
COMMENTS: ____

ATTACHMENT C

HYDROGRAPHS

GROUNDWATER MONITOR WELL MW-1

Abandoned Chevron Asphalt Plant and Terminal Emeryville, California

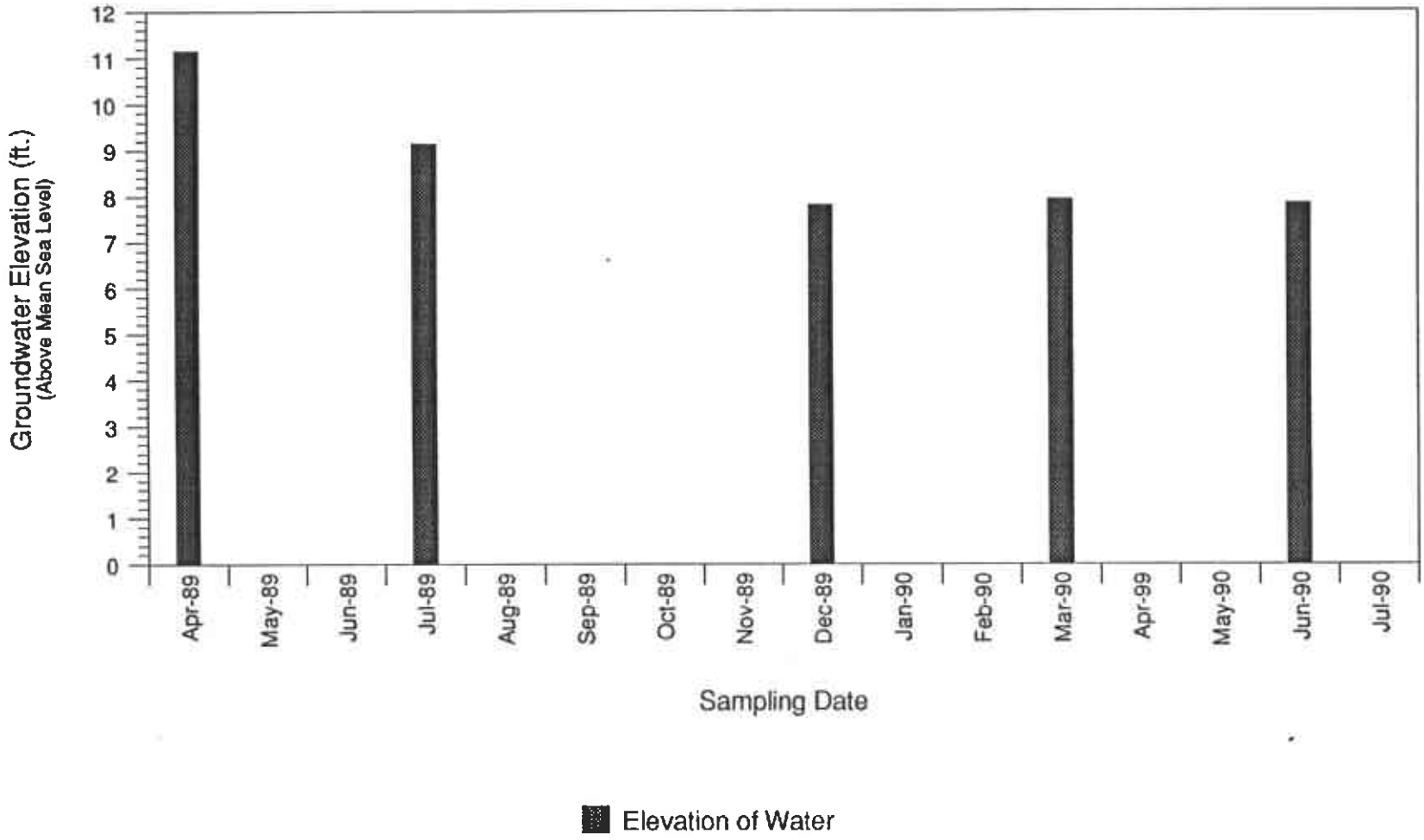


WGR #1-045.44

WESTERN GEOLOGIC RESOURCES, INC.

GROUNDWATER MONITOR WELL MW-2

Abandoned Chevron Asphalt Plant and Terminal Emeryville, California

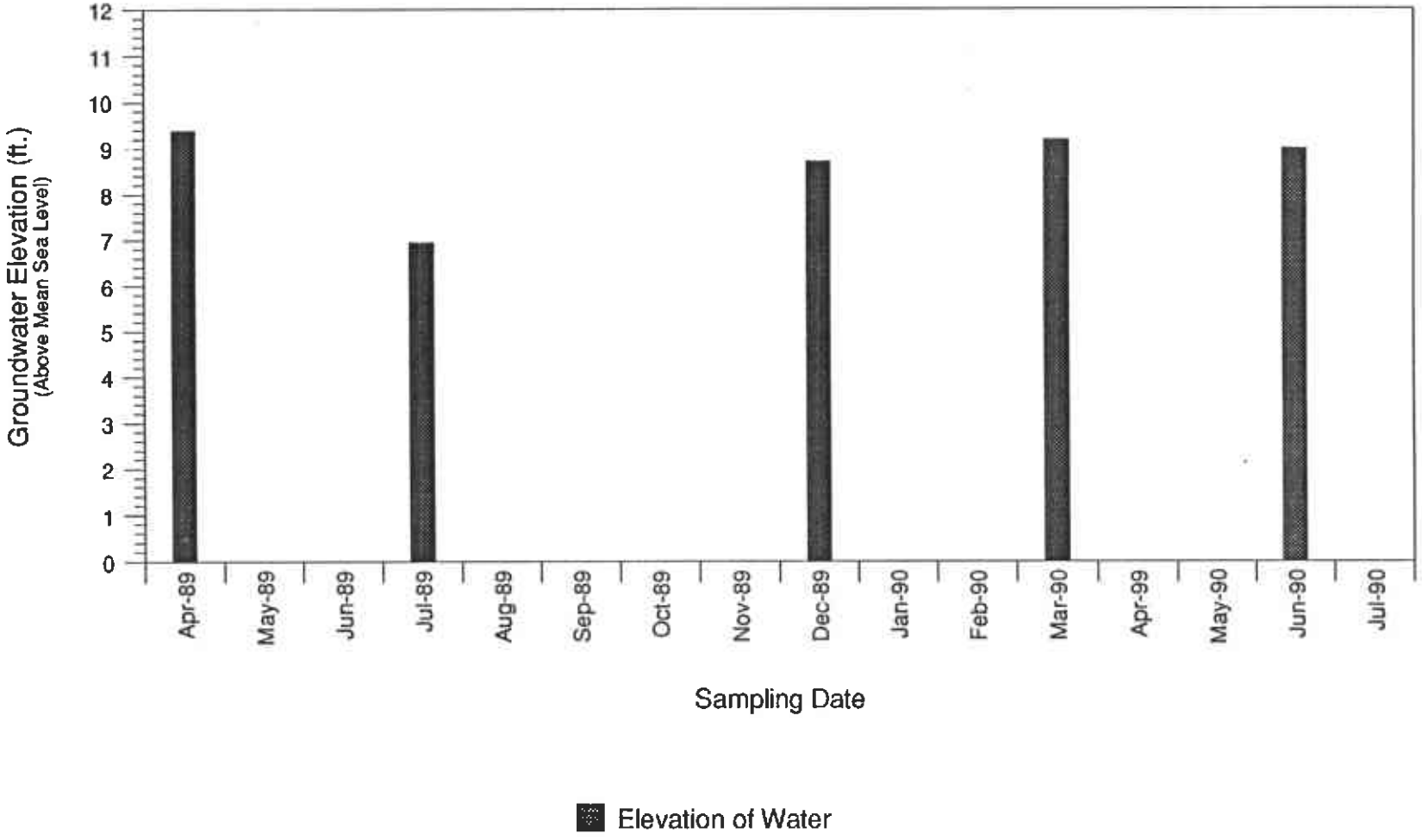


WGR #1-045.44

WESTERN GEOLOGIC RESOURCES, INC.

GROUNDWATER MONITOR WELL MW-3

Abandoned Chevron Asphalt Plant and Terminal Emeryville, California

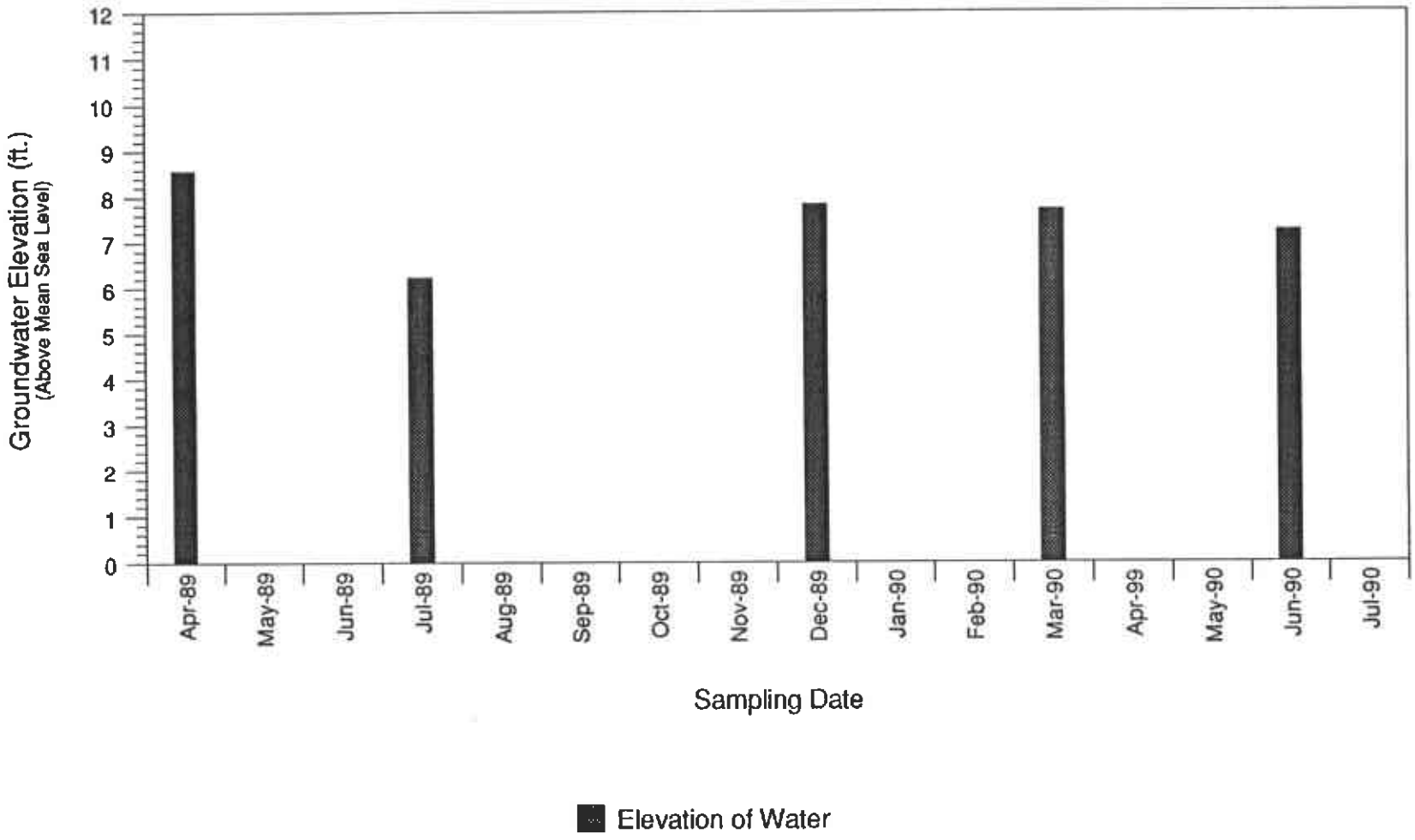


WGR #1-045.44

WESTERN GEOLOGIC RESOURCES, INC.

GROUNDWATER MONITOR WELL MW-7

Abandoned Chevron Asphalt Plant and Terminal Emeryville, California

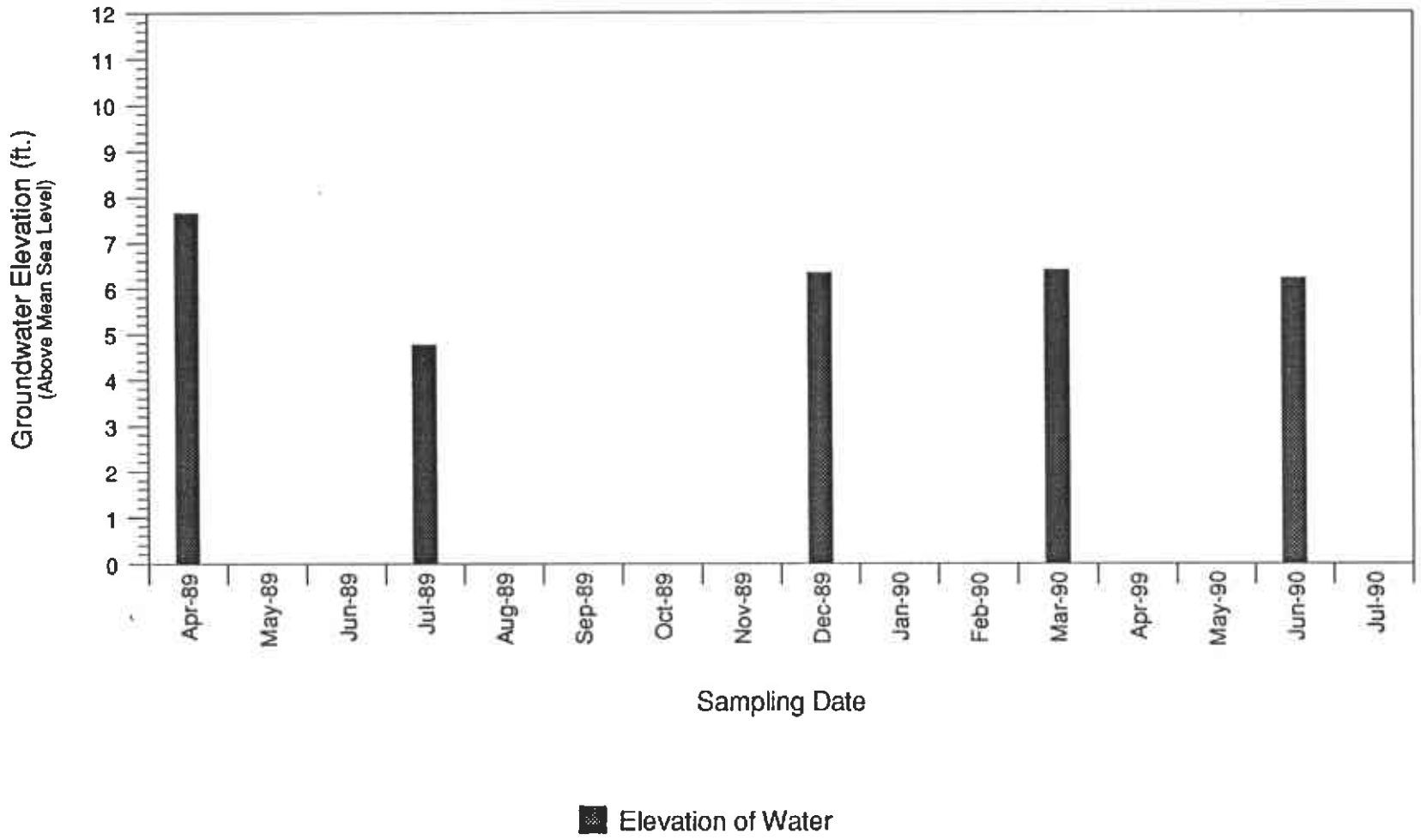


WGR #1-045.44

WESTERN GEOLOGIC RESOURCES, INC.

GROUNDWATER MONITOR WELL MW-8

Abandoned Chevron Asphalt Plant and Terminal Emeryville, California



ATTACHMENT D

CHAIN-OF-CUSTODY FORMS

SHEET 1 of 2

Chain-of-Custody Record

Chevron U.S.A. Inc.
P.O. Box 5004
San Ramon, CA 94583
FAX (415) 842-9591

Chevron Facility Number: EMERYVILLE ASPHALT PLANT
Consultant Release Number:
Consultant Project Number: 1-045.44
Consultant Name: WGR INC.
Address: SAN RAFAEL
Fax Number:
Project Contact (Name): CHRIS ALGERS
(Phone): 415 457 7595

Chevron Contact (Name): LISA MARINARO
(Phone): 415 842 9527
Laboratory Name: G-TEL
Contract Number: 27B0700
Samples Collected by (Name): M. FAYE, J. KREBS, K. FENGEL, D. BRADY
Collection Date: 6.19.90
Signature: Mark Faye

Sample Number	Lab Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite	Time	Sample Preservation	Iced	Analyses To Be Performed: Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline + Diesel	503 Oil and Grease	Arom. Volatiles - BTXE Soil: 8020/Wtr.: 602	Arom. Volatiles - BTXE Soil: 8240/Wtr.: 624	Total Lead DHS-Luft	EDB DHS-AB 1803	EPA 601	ORGANIC LEAD		Remarks
ABCD 06190-01		4	W		1605	SEE REMARKS	X	X			X				X			A,B SAMPLES NOT VOA'S W/ HCl
ABCD 06190-02					1546													
ABCD 06190-C3					1555													C,D SAMPLES NOT VOA'S W/ NO PRES.
ABCD 06190-C7					1235													
ABCD 06190-D8					1435													
ABCD 06190-10					1632													E SAMPLES NOT 1 LITER BROWN GLASS W/ NO PRES.
ABCD 06190-11					1523													
ABCD 06190-12					1613													
ABCD 06190-13			↓		1553											X		
ABCDE 06190-14		5			1611													
ABCDE 06190-15		4			1444											X		
ABCDE 06190-16		5			1527													
ABCDE 06190-17		↓	↓		1450	↓	↓	↓			↓				↓	X		

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Mark Faye	WGR	6.19.90 18:00			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time

Turn Around Time (Circle Choice)
24 Hrs
48 Hrs
5 Days
(10 Days)

White / Project File Canary / Sampler Pink / Lab

SHEET 2 of 2

Chain-of-Custody Record

Chevron U.S.A. Inc.
P.O. Box 5004
San Ramon, CA 94583
FAX (415) 842-9591

Chevron Facility Number: EMERYVILLE ASPHALT PLANT
Consultant Release Number:
Consultant Project Number: 1-045.44
Consultant Name: WGR INC.
Address: SAN RAFAEL
Fax Number:
Project Contact (Name): CHRIS HEDRICKS
(Phone): 415 457 7595

Chevron Contact (Name): LISA MARINARO
(Phone): 415 842 9527
Laboratory Name: S-TEL
Contract Number: 2780700
Samples Collected by (Name): M. FAYE, J. KREBS, K. PENGEL, D. BRADY
Collection Date: 6.19.90
Signature:

Sample Number	Lab Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite	Time	Sample Preservation	Iced	Analyses To Be Performed: Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline + Diesel	503 Oil and Grease	Arom. Volatiles - BTXE Soil: 8020/Wtr.: 602	Arom. Volatiles - BTXE Soil: 8240/Wtr.: 624	Total Lead DHS-Luft	EDB DHS-AB 1803	EPA 601	ORGANIC LEAD		Remarks
ABLDE 06190-18		5	W		1420	SEE REMARKS	X	X			X					X		H,R SAMPLES ARE VOA's w/ HCl
ABLDE 06190-19		↓	↓		1249		↓	↓			↓					X		
AC 06190-20		2	↓		—		↓	↓			↓				↓			C, D SAMPLES ARE VOA w/ NO PRES.
																		E SAMPLES ARE 1 LITER AMBER GLASS w/ NO PRES.

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
	WGR	6-19-90 18:00			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time

Turn Around Time (Circle Choice)
24 Hrs
48 Hrs
5 Days
(10 Days)

Printed in U.S.A.

White / Project File Canary / Sampler Pink / Lab

ATTACHMENT E

LABORATORY REPORTS WITH QUALITY ASSURANCE/
QUALITY CONTROL DOCUMENTS

GTEL
ENVIRONMENTAL
LABORATORIES, INC.

Northwest Region
4080 Pike Lane
Concord, CA 94520
(415) 685-7852
(800) 544-3422 from inside California
(800) 423-7143 from outside California

Project Number: SFB-175-0204.72
Consultant Project Number: 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: Emeryville Asphalt Plant
Work Order Number: D006477, D006478, D006479
Report Issue Date: July 5, 1990

Chris Algers
Western Geologic Resources
2169 E. Francisco Blvd.
San Rafael, CA 94901

Dear Mr. Algers:

Enclosed please find the analytical results for samples received by GTEL Environmental Laboratories on 06/20/90.

A formal quality control/quality assurance program is maintained by GTEL, which is designed to meet or exceed the EPA requirements. Analytical work for this project met QA/QC criteria unless otherwise stated in the footnotes.

GTEL is certified by the California State Department of Health Services to perform analyses for drinking water, wastewater, and hazardous waste materials according to approved protocols.

If you have any questions concerning this analysis, or if we can be of further assistance, please call our Customer Service Representative.

Sincerely,

GTEL Environmental Laboratories, Inc.

Emma P. Popek

Emma P. Popek
Laboratory Director

Project Number: SFB-175-0204.72
Consultant Project Number: 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: EmeryvilleAsphalt Plant
Work Order Number: D006477
Report Issue Date: June 29, 1990

Table 1

ANALYTICAL RESULTS

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015[1]

GTEL Sample Number		01	02	03	04
Client Identification		ABCD 06190-01	ABCD 06190-02	ABCD 06190-03	ABCD 06190-07
Date Sampled		06/19/90	06/19/90	06/19/90	06/19/90
Date Analyzed		06/23/90	06/23/90	06/23/90	06/23/90
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.3	100	<0.3	<0.3	<0.3
Toluene	0.3	<0.3	<0.3	<0.3	<0.3
Ethylbenzene	0.3	<0.3	<0.3	<0.3	<0.3
Xylene (total)	0.6	7	<0.6	<0.6	<0.6
TPH as Gasoline	50	2700	<50	<50	<50

GTEL Sample Number		05	06	07	08
Client Identification		ABCD 06190-08	ABCD 06190-10	ABCD 06190-11	ABCD 06190-12
Date Sampled		06/19/90	06/19/90	06/19/90	06/19/90
Date Analyzed		06/23/90	06/23/90	06/23/90	06/23/90
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.3	<0.3	<0.3	<0.3	<0.3
Toluene	0.3	<0.3	<0.3	<0.3	<0.3
Ethylbenzene	0.3	<0.3	<0.3	<0.3	<0.3
Xylene (total)	0.6	<0.6	<0.6	<0.6	<0.6
TPH as Gasoline	50	<50	<50	<50	<50

1 = Extraction by EPA Method 5030

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: SFB-175-0204.72
Consultant Project Number: 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: EmeryvilleAsphalt Plant
Work Order Number: D006477
Report Issue Date: June 29, 1990

Table 1 (continued)

ANALYTICAL RESULTS

Purgeable Aromatics and Total Petroleum Hydrocarbons as Gasoline in Water
EPA Method 8020/8015[1]

GTEL Sample Number		09	10	11	12
Client Identification		ABCD 06190-13	ABCD 06190-14	ABCD 06190-15	ABCDE 06190-16
Date Sampled		06/19/90	06/19/90	06/19/90	06/19/90
Date Analyzed		06/23/90	06/23/90	06/23/90	06/25/90
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.3	<0.3	<0.3	<0.3	<0.3
Toluene	0.3	<0.3	<0.3	<0.3	<0.3
Ethylbenzene	0.3	0.8	<0.3	<0.3	<0.3
Xylene (total)	0.6	3	<0.6	<0.6	<0.6
TPH as Gasoline	50	180	77	<50	<50

GTEL Sample Number		13	14	15	16
Client Identification		ABCDE 06190-17	ABCDE 06190-18	ABCDE 06190-19	AC 06190-20
Date Sampled		06/19/90	06/19/90	06/19/90	06/19/90
Date Analyzed		06/23/90	06/23/90	06/23/90	06/23/90
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Benzene	0.3	<0.3	<0.3	<0.3	<0.3
Toluene	0.3	<0.3	<0.3	<0.3	<0.3
Ethylbenzene	0.3	<0.3	<0.3	<0.3	<0.3
Xylene (total)	0.6	<0.6	<0.6	<0.6	<0.6
TPH as Gasoline	50	<50	<50	<50	<50

1 = Extraction by EPA Method 5030

GTEL ENVIRONMENTAL LABORATORIES, INC.

QA Conformance Summary

Purgeable Aromatics and Total Petroleum Hydrocarbons as Gasoline in Water EPA Method 8020/8015

1.0 Blanks

Five of 5 target compounds were below detection limits in the reagent blank as shown in Table 2.

2.0 Independent QC Check Sample

The control limits were met for 4 out of 4 QC check compounds as shown in Table 3.

3.0 Surrogate Compound Recoveries

Percent recovery limits were met for the surrogate compound (naphthalene) for all samples as shown in Table 4.

4.0 Matrix Spike (MS) Accuracy

Percent recovery limits were met for 4 of 4 compounds in the MS as shown in Table 5.

5.0 Reagent Water Spike (WS) and Reagent Water Spike (WSD) Duplicate Precision

Relative percent difference (RPD) criteria was met for 4 of 4 analytes in the WS and WSD as shown in Table 6.

6.0 Sample Handling

6.1 Sample handling and holding time criteria were met for all samples.

6.2 There were no exceptional conditions requiring dilution of samples.

Table 2

REAGENT BLANK DATA

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015

Date of Analysis: 06/25/90

Analyte	Concentration, ug/L
Benzene	<0.3
Toluene	<0.3
Ethylbenzene	<0.3
Xylene (total)	<0.6
Gasoline	<50

< # = Not detected at the indicated detection limit.

Project Number: SFB-175-0204.72
Consultant Project Number: 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: EmeryvilleAsphalt Plant
Work Order Number: D006477
Report Issue Date: June 29, 1990

Table 3

INDEPENDENT QC CHECK SAMPLE RESULTS

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015

Date of Analysis: 06/25/90

Analyte	Expected Result, ug/L	Observed Result, ug/L	Recovery, %	Acceptability Limits, %
Benzene	50	57	114	85 - 115
Toluene	50	49.5	99	85 - 115
Ethylbenzene	50	55	110	85 - 115
Xylene (total)	150	166	111	85 - 115

Table 3a

INDEPENDENT QC CHECK SAMPLE SOURCE

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015

Analyte	Lot Number	Source
Benzene	LA18042	Supelco
Toluene	LA18042	Supelco
Ethylbenzene	LA18042	Supelco
Xylene (total)	LA18042	Supelco

Table 4

SURROGATE COMPOUND RECOVERY

Naphthalene

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015

Acceptability Limits[1]: 70 - 130 %

GTEL No.	Expected Result, ug/L	Surrogate Result, ug/L	Surrogate Recovery, %
Blank	200	184	92
01	200	208	104
02	200	167	84
03	200	172	86
04	200	174	87
05	200	183	92
06	200	159	80
07	200	167	84
08	200	176	88
09	200	223	112
10	200	243	122
11	200	170	85
12	200	142	71
13	200	140	70
14	200	151	76
MS	200	198	99
WS	200	182	91
WSD	200	176	88

MS = Matrix Spike
WS = Reagent Water Spike
WSD = Reagent Water Spike Duplicate
1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

Table 4(continued)

SURROGATE COMPOUND RECOVERY

Naphthalene

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015

Acceptability Limits[1]: 70 - 130 %

GTEL No.	Expected Result, ug/L	Surrogate Result, ug/L	Surrogate Recovery, %
15	200	166	83
16	200	155	78

MS = Matrix Spike
WS = Reagent Water Spike
WSD = Reagent Water Spike Duplicate
1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

Project Number: SFB-175-0204.72
Consultant Project Number: 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: EmeryvilleAsphalt Plant
Work Order Number: D006477
Report Issue Date: June 29, 1990

Table 5

MATRIX SPIKE (MS) RECOVERY REPORT

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015

Date of Analysis: 06/25/90
Sample Spiked: D006477-03
Client ID: 06190-03 ABCD
Units: ug/L

Analyte	Sample Result	Concentration Added	Concentration Recovered	MS Result	MS, % Recovery	Acceptability Limits[1], %
Benzene	<0.3	25	25	25	100	71 - 123
Toluene	<0.3	25	24.2	24.2	97	69 - 120
Ethylbenzene	<0.3	25	25.1	25.1	100	72 - 121
Xylene (total)	<0.6	75	78.2	78.2	104	75 - 123

<# = Not detected at the indicated detection limit.
1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: SFB-175-0204.72
Consultant Project Number: 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: EmeryvilleAsphalt Plant
Work Order Number: D006477
Report Issue Date: June 29, 1990

Table 6

REAGENT WATER SPIKE (WS) AND REAGENT WATER SPIKE DUPLICATE (WSD)
RECOVERY AND RELATIVE PERCENT DIFFERENCE (RPD) REPORT

Purgeable Aromatics and Total Petroleum Hydrocarbons
as Gasoline in Water
EPA Method 8020/8015

Date of Analysis: 06/25/90 Units: ug/L

Analyte	Concentration Added	WS Result	WS, % Recovery	WSD Result	WSD, % Recovery
Benzene	25	23.9	96	24.6	98
Toluene	25	23.1	92	23.8	95
Ethylbenzene	25	23.8	95	24.6	98
Xylene (total)	75	74.7	100	76.1	101

Analyte	RPD, %	Maximum RPD, %	Acceptability Limits[1] % Recovery
Benzene	2	30	76 - 120
Toluene	3	30	72 - 117
Ethylbenzene	3	30	73 - 123
Xylene (total)	1	30	81 - 125

1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: SFB-175-0204.72
Consultant Project Number 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: Emeryville Asphalt Plant
Work Order Number: D006478
Report Issue Date: July 3, 1990

Table 1

ANALYTICAL RESULTS

Purgeable Halocarbons in Water
EPA Method 601

Date Sampled		06/19/90	06/19/90	06/19/90	06/19/90
Date Analyzed		06/21/90	06/21/90	06/21/90	06/21/90
Client Identification		06190-01 ABCD	06190-02 ABCD	06190-03 ABCD	06190-07 ABCD
GTEL Sample Number		01	02	03	04
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Chloromethane	0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	1	**1200**	<1	<1	<1
Chloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	0.2	**12**	<0.2	<0.2	<0.2
1,1-Dichloroethane	0.5	**3.1**	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	0.5	**6100**	<0.5	<0.5	<0.5
Chloroform	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5	<0.5	<0.5	<0.5	**0.67**
Carbon tetrachloride	0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	0.5	**81**	<0.5	<0.5	<0.5
Dibromochloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
2-Chloroethylvinyl ether	1	<1	<1	<1	<1
Bromoform	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5

1 = Extraction by EPA Method 5030

Project Number: SFB-175-0204.72
Consultant Project Number 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: Emeryville Asphalt Plant
Work Order Number: D006478
Report Issue Date: July 3, 1990

Table 1(continued)

ANALYTICAL RESULTS

Purgeable Halocarbons in Water
EPA Method 601

Date Sampled		06/19/90	06/19/90	06/19/90	06/19/90
Date Analyzed		06/21/90	06/21/90	06/21/90	06/21/90
Client Identification		06190-08 ABCD	06190-10 ABCD	06190-11 ABCD	06190-12 ABCD
GTEL Sample Number		05	06	07	08
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Chloromethane	0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	1	<1	<1	1	<1
Chloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	0.2	<0.2	0.3	0.68	<0.2
1,1-Dichloroethane	0.5	<0.5	2.6	1.3	<0.5
trans-1,2-Dichloroethene	0.5	0.59	33	140	<0.5
Chloroform	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	0.5	<0.5	6.3	5.0	<0.5
Dibromochloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
2-Chloroethylvinyl ether	1	<1	<1	<1	<1
Bromoform	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5

1 = Extraction by EPA Method 5030

Project Number: SFB-175-0204.72
Consultant Project Number 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: Emeryville Asphalt Plant
Work Order Number: D006478
Report Issue Date: July 3, 1990

Table 1(continued)

ANALYTICAL RESULTS

Purgeable Halocarbons in Water
EPA Method 601

Date Sampled		06/19/90	06/19/90	06/19/90	06/19/90
Date Analyzed		06/21/90	06/21/90	06/21/90	06/21/90
Client Identification		06190-13 ABCD	06190-14 ABCDE	06190-15 ABCD	06190-16 ABCDE
GTEL Sample Number		09	10	11	12
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Chloromethane	0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	1	<1	<1	<1	<1
Chloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	0.5	<0.5	<0.5	<0.5	**2.0**
1,2-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	0.5	<0.5	<0.5	<0.5	**35**
Dibromochloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
2-Chloroethylvinyl ether	1	<1	<1	<1	<1
Bromoform	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	0.5	<0.5	<0.5	<0.5	**7.7**
Chlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5

1 = Extraction by EPA Method 5030

Project Number: SFB-175-0204.72
Consultant Project Number 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: Emeryville Asphalt Plant
Work Order Number: D006478
Report Issue Date: July 3, 1990

Table 1(continued)

ANALYTICAL RESULTS

Purgeable Halocarbons in Water
EPA Method 601

	Date Sampled	06/19/90	06/19/90	06/19/90	06/19/90
	Date Analyzed	06/23/90	06/23/90	06/23/90	06/23/90
	Client Identification	06190-17 ABCDE	06190-18 ABCDE	06190-19 ABCDE	06190-20 AC
	GTEL Sample Number	13	14	15	16
Analyte	Detection Limit, ug/L	Concentration, ug/L			
Chloromethane	0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	1	<1	<1	<1	<1
Chloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride	0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethene	0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethene	0.5	3.1	**2.7**	**13**	<0.5
Chloroform	0.5	**1.2**	**0.73**	**2.8**	<0.5
1,2-Dichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5	**1.0**	**0.90**	**1.5**	<0.5
Carbon tetrachloride	0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	0.5	**38**	**63**	**46**	<0.5
Dibromochloromethane	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	0.5	<0.5	<0.5	<0.5	<0.5
2-Chloroethylvinyl ether	1	<1	<1	<1	<1
Bromoform	0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	0.5	**13**	**20**	**47**	<0.5
Chlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,3-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5	<0.5	<0.5	<0.5	<0.5

1 = Extraction by EPA Method 5030

QA Conformance Summary

Purgeable Halocarbons in Water
EPA Method 601

1.0 Blanks

Zero of 29 target compounds found in Reagent blank as shown in Table 2.

2.0 Independent QC Check Sample

The control limits were met for 8 out of 8 QC check compounds as shown in Table 3.

3.0 Surrogate Compound Recoveries

Percent recovery limits were met for the surrogate compound (Bromofluorobenzene) for all samples as shown in Table 4.

4.0 Matrix Spike (MS) Accuracy

Percent recovery limits were met for 3 of 3 compounds in the MS as shown in Table 5.

5.0 Reagent Water Spike (WS) and Reagent Water Spike Duplicate (WSD) Precision

Relative percent difference (RPD) criteria was met for 3 of 3 compounds in the WS and WSD as shown in Table 6.

6.0 Sample Handling

6.1 Sample handling and holding time criteria were met for all samples.

6.2 There were no exceptional conditions requiring dilution of samples.

Project Number: SFB-175-0204.72
Consultant Project Number 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: Emeryville Asphalt Plant
Work Order Number: D006478
Report Issue Date: July 3, 1990

Table 2

REAGENT BLANK DATA

Purgeable Halocarbons in Water
EPA Method 601

Date of Analysis: 06/21/90

Analyte	Observed Result, ug/L
Chloromethane	<0.5
Bromomethane	<0.5
Dichlorodifluoromethane	<0.5
Vinyl chloride	<1
Chloroethane	<0.5
Methylene chloride	<0.5
Trichlorofluoromethane	<0.5
1,1-Dichloroethene	<0.2
1,1-Dichloroethane	<0.5
trans-1,2-Dichloroethene	<0.5
Chloroform	<0.5
1,2-Dichloroethane	<0.5
1,1,1-Trichloroethane	<0.5
Carbon tetrachloride	<0.5
Bromodichloromethane	<0.5
1,2-Dichloropropane	<0.5
trans-1,3-Dichloropropene	<0.5
Trichloroethene	<0.5
Dibromochloromethane	<0.5
1,1,2-Trichloroethane	<0.5
cis-1,3-Dichloropropene	<0.5
2-Chloroethylvinyl ether	<1
Bromoform	<0.5
1,1,2,2-Tetrachloroethane	<0.5
Tetrachloroethene	<0.5
Chlorobenzene	<0.5
1,3-Dichlorobenzene	<0.5
1,2-Dichlorobenzene	<0.5
1,4-Dichlorobenzene	<0.5

<# = Not Detected at the indicated detection limit.

Project Number: SFB-175-0204.72
Consultant Project Number 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: Emeryville Asphalt Plant
Work Order Number: D006478
Report Issue Date: July 3, 1990

Table 3

INDEPENDENT QC CHECK SAMPLE RESULTS

Purgeable Halocarbons in Water
EPA Method 601

Date of Analysis: 06/21/90

Analyte	Expected Result, ug/L	Observed Result, ug/L	Recovery, %	Acceptability Limits, %
Vinyl Chloride	50	49.7	100	85 - 115
Chloroform	50	54.5	109	85 - 115
1,2-Dichloroethane	50	55.4	111	85 - 115
cis-1,3-Dichloropropene	50	44.2	88	85 - 115
1,1,2-Trichloroethane	50	53.3	107	85 - 115
Tetrachloroethene	50	56.5	113	85 - 115
Chlorobenzene	50	54.8	110	85 - 115
Tetrachloroethane	50	56.1	112	85 - 115

Table 3a

INDEPENDENT QC CHECK SAMPLE SOURCE

Purgeable Halocarbons in Water
EPA Method 601

Analyte	Lot Number	Source
Vinlyl Chloride	LA21062	Purgeable C Supelco
Chloroform	LA21173	Purgeable A Supelco
1,2-Dichloroethane	LA20674	Purgeable B Supelco
cis-1,3-Dichloropropene	LA20674	Purgeable B Supelco
1,1,2-Trichloroethane	LA21173	Purgeable A Supelco
Tetrachloroethene	LA21173	Purgeable A Supelco
Chlorobenzene	LA21173	Purgeable A Supelco
Tetrachloroethane	LA20674	Purgeable B Supelco

Project Number: SFB-175-0204.72
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Table 4

SURROGATE COMPOUND RECOVERY

Bromofluorobenzene

Purgeable Halocarbons in Water
EPA Method 601

Acceptability Limits[1]: 63 - 131 %

GTEL No.	Expected Result, ug/L	Surrogate Result, ug/L	Surrogate Recovery, %
Blank	50	49	98
01	50	49	98
02	50	45	90
03	50	44	88
04	50	45	90
05	50	44	88
06	50	45	90
07	50	45	90
08	50	46	92
09	50	45	90
10	50	52	90
11	50	45	90
12	50	52	104
13	50	54	108
14	50	52	104
15	50	50	100
16	50	39	78
MS	50	41	82
WS	50	46	92
WSD	50	46	92

MS = Matrix Spike
WS = Reagent Water Spike
WSD = Reagent Water Spike Duplicate
1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

Project Number: SFB-175-0204.72
Consultant Project Number 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: Emeryville Asphalt Plant
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Table 5

MATRIX SPIKE (MS) RECOVERY REPORT

Purgeable Halocarbons in Water
EPA Method 601

Date of Analysis: 06/21/90
Sample Spiked: D006540-02

Units: ug/L

Analyte	Sample Result	MS Result	Concentration Added	MS, % Recovery	Acceptability Limits, %[1]
1,1-Dichloroethene	<0.5	4.74	5	95	64 - 114
Chlorobenzene	<0.5	4.70	5	94	58 - 123
Trichloroethene	<0.5	5.63	5	112	66 - 120

< # = Not detected at the indicated detection limit.
1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

Project Number: SFB-175-0204.72
Consultant Project Number 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: Emeryville Asphalt Plant
Work Order Number: D006478
Report Issue Date: July 3, 1990

Table 6

REAGENT WATER SPIKE (WS) AND REAGENT WATER SPIKE DUPLICATE (WSD) RESULTS
AND RELATIVE PERCENT DIFFERENCE (RPD) REPORT

Purgeable Halocarbons in Water
EPA Method 601

Date of Analysis: 06/21/90 Units: ug/L

Analyte	Concentration Added	WS Result	WSD Result	WS, % Recovery	WSD, % Recovery
1,1 Dichloroethene	5	43.5	4.37	87	87
Chlorobenzene	5	4.41	4.18	88	84
Trichloroethene	5	4.47	5.49	109	110

Analyte	RPD, %	Maximum RPD, %	Acceptability Limits % Recovery[1]
1,1 Dichloroethene	0	30	72-116
Chlorobenzene	5	30	58-126
Trichloroethene	1	30	79-119

1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

Project Number: SFB-175-0204.72
Consultant Project Number: 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: Emeryville Asphalt Plant
Work Order Number: D006479
Report Issue Date: July 3, 1990

Table 1

ANALYTICAL RESULTS

Organic Lead in Water by Flame AA
EPA Method 7420[1]

Sample Identification		Date Sampled	Date Extracted	Date Analyzed	Concentration ug/L (2)
GTEL No.	Client ID				
01	ABCDE 06190-14	06/19/90	06/28/90	06/28/90	<50
02	ABCDE 06190-16	06/19/90	06/28/90	06/28/90	<50
03	ABCDE 06190-17	06/19/90	06/28/90	06/28/90	<50
04	ABCDE 06190-18	06/19/90	06/28/90	06/28/90	<50
05	ABCDE 06190-19	06/19/90	06/28/90	06/28/90	<50

1 = Extraction by DHS method; LUFT Manual, 12/87 rev.: 250 mL sample extracted with 50 mL Xylene/MIBK mixture, Aliquat 336.
2 = Method detection limit = 50 ug/L; analyte below this level would not be detected.

GTEL ENVIRONMENTAL LABORATORIES, INC.

Project Number: SFB-175-0204.72
Consultant Project Number: 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: Emeryville Asphalt Plant
Work Order Number: D006479
Report Issue Date: July 3, 1990

QA Conformance Summary

Organic Lead in Water by Flame AA
EPA Method 7420

1.0 Blanks

The method blank was below the detection limit as shown in Table 2.

2.0 Initial Instrument Calibration

The range of concentrations of the initial instrument calibration are shown in Table 3.

3.0 Calibration Verification Standards

3.1 The control limits were met for the initial calibration verification standard (ICVS) as shown in Table 4.

3.2 The control limits were met for the continuing calibration verification standard (CCVS) as shown in Table 4.

4.0 Sample Duplicate Precision

Relative percent difference criterion was met for the sample duplicate as shown in Table 5.

5.0 Sample Handling

5.1 Sample handling and holding time criteria were met for all samples.

5.2 There were no exceptional conditions requiring dilution of samples.

Project Number: SFB-175-0204.72
Consultant Project Number: 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: Emeryville Asphalt Plant
Work Order Number: D006479
Report Issue Date: July 3, 1990

Table 2

METHOD BLANK DATA

Organic Lead in Water by Flame AA
EPA Method 7420

Date of Analysis: 06/28/90

Analyte	Concentration, ug/L
Organic Lead	<50

<# = Not detected at the indicated detection limit.

Table 3

INITIAL CALIBRATION STANDARDS DATA

Organic Lead in Water by Flame AA
EPA Method 7420

Date of Analysis: 06/28/90

Standard Number	Concentration, ug/L
1	0
2	400
3	800
5	2000

Project Number: SFB-175-0204.72
Consultant Project Number: 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: Emeryville Asphalt Plant
Work Order Number: D006479
Report Issue Date: July 3, 1990

Table 4

INITIAL AND CONTINUING CALIBRATION
VERIFICATION STANDARDS RESULTS

Organic Lead in Water by Flame AA
EPA Method 7420

Date of Analysis: 06/28/90

Initial Calibration Verification Standard				
Analyte	Expected Result, ug/L	Observed Result, ug/L	Recovery, %	Acceptability Limits, %[1]
Organic Lead	800	795	99	80 - 120
Continuing Calibration Verification Standard				
Analyte	Expected Result, ug/L	Observed Result, ug/L	Recovery, %	Acceptability Limits, %[1]
Organic Lead	800	871	109	80 - 120

1 = Acceptability limits are derived from the 99% confidence interval of all samples during the previous quarter.

Table 4a

INITIAL AND CONTINUING CALIBRATION
VERIFICATION STANDARDS SOURCE

Organic Lead in Water by Flame AA
EPA Method 7420

Initial Calibration Verification Standard		
Analyte	Lot Number	Source
Organic Lead	AK215	Spectrum
Continuing Calibration Verification Standard		
Analyte	Lot Number	Source
Organic Lead	AK215	Spectrum

Project Number: SFB-175-0204.72
Consultant Project Number: 1-045.44
Contract Number: N46CWC0244-9-X
Facility Number: Emeryville Asphalt Plant
Work Order Number: D006479
Report Issue Date: July 3, 1990

Table 5

LABORATORY DUPLICATE SAMPLE RESULTS
AND RELATIVE PERCENT DIFFERENCE (RPD) REPORT

Organic Lead in Water by Flame AA
EPA Method 7420

Date of Analysis: 06/28/90
Sample Used: D006479-05
Client ID: 06190-19 ABCDE
Units: ug/L

Analyte	Sample Result	Duplicate Result	RPD, %	Maximum RPD, %
Organic Lead	<50	<50	NA	20

NA = Not Applicable

GTEL ENVIRONMENTAL LABORATORIES, INC.