

NOV 29 1991



December 19, 1991

Lucia Chou
Chevron USA
P.O. Box 5004
San Ramon, CA 94583

Re: Former Chevron Asphalt Plant and
Terminal #1001067
1520 Powell Street
Emeryville, California
SES Project #1-191-04

Dear Ms. Chou:

This report presents the results of the quarterly water sampling at former Chevron Asphalt Plant and Terminal #1001067, located at 1520 Powell Street in Emeryville, California (Figure 1, Appendix A). Ground water samples from 15 wells, MW-1, MW-2, MW-3, MW-7, MW-8, and MW-10 through MW-19, were collected (Figure 2, Appendix A).

On November 27, 1991, SES personnel visited the site. Water level measurements were collected in all site wells and all wells were checked for the presence of free-phase hydrocarbons. Free-phase hydrocarbons were not present in any of the site wells. Water level data is shown in Table 1 (Appendix B) and a ground water elevation contour map is included as Figure 2 (Appendix A).

The water samples were collected on November 27, 1991 in accordance with SES Standard Operating Procedure - Ground Water Sampling (Appendix C). All analyses were performed by Superior Precision Analytical, Inc. of Martinez, California. Analytic results for ground water are presented in Tables 2 and 3 (Appendix B). Chain of custody documents and laboratory analytic reports are included in Appendix D. SES is not responsible for laboratory omissions or errors.

Thank you for allowing us to provide services to Chevron. Please call if you have any questions.

Sincerely,
Sierra Environmental Services

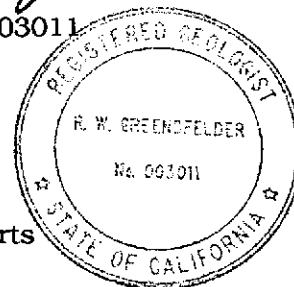
Chris J. Bramer
Senior Project Engineer

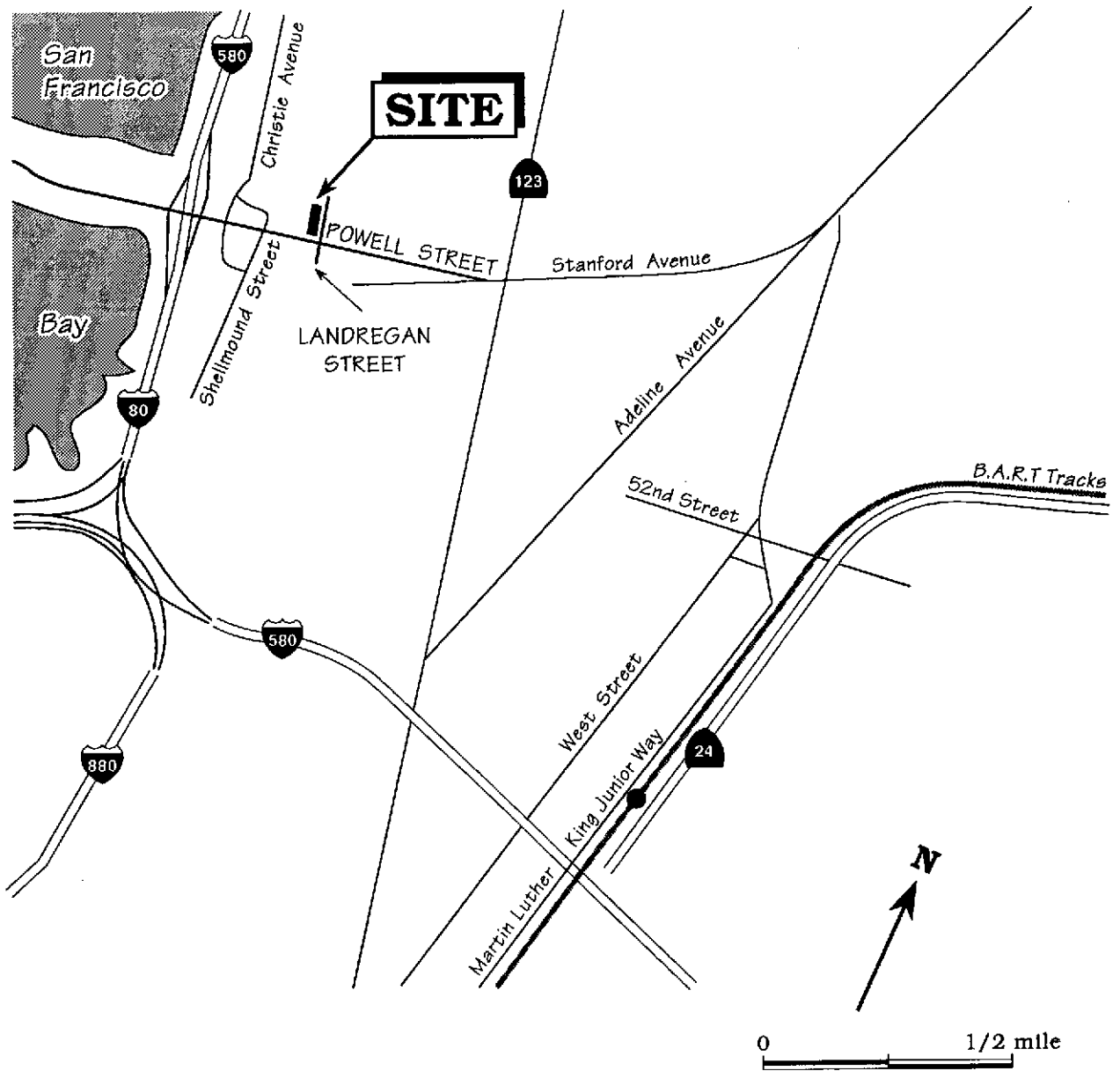
Dr. Roger Greensfelder
Registered Geologist #003011

CJB/RG/ly
19104QM.DE1

Appendices

- A - Figures
- B - Tables
- C - SES Standard Operating Procedure
- D - Chain of Custody Documents and Laboratory Analytic Reports




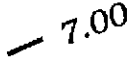


Base map ref: California State Automobile Association (AAA)

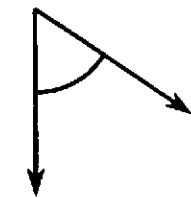
Figure 1. Site Location Map - Former Chevron Asphalt Plant and Terminal #1001067 - Emeryville, California



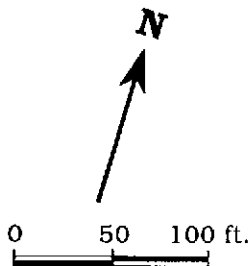
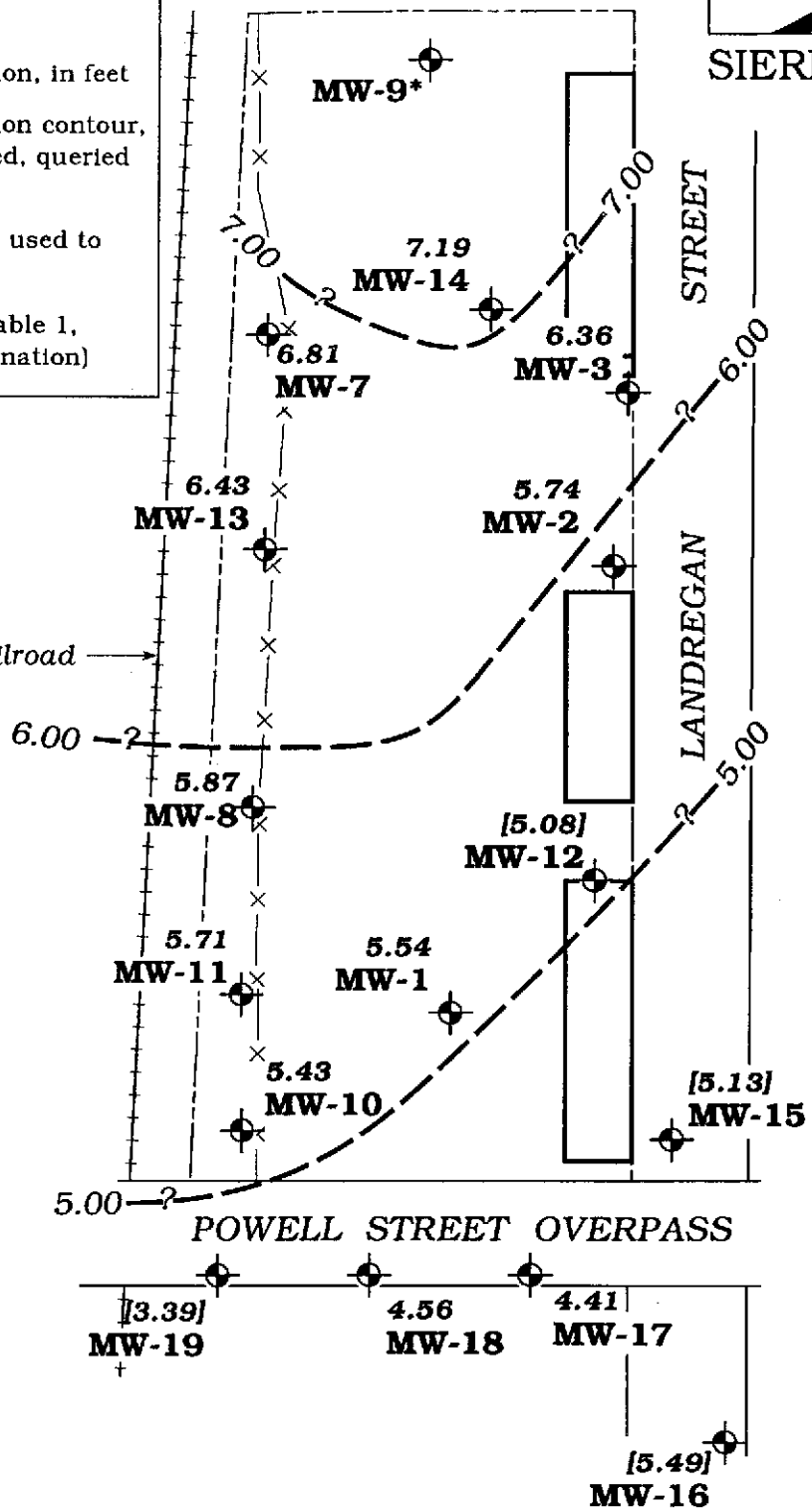
EXPLANATION

-  **MW-19** Monitoring well
- 6.81** Ground water elevation, in feet
-  **7.00** Ground water elevation contour, dashed where inferred, queried where uncertain
- [5.08]** Anomalous data, not used to determine gradient
- MW-9*** Not measured (see Table 1, Appendix B for explanation)

Approximate ground water flow direction

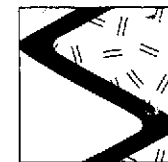


Southern Pacific Railroad



Base map after Western Geologic Resources, Inc.

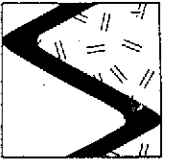
Figure 2. Monitoring Well Locations and Ground Water Elevation Contours - November 27, 191 - Former Chevron Asphalt Plant and Terminal #1001067, Emeryville, California



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Table 1. Water Level Data and Well Construction Details - Former Chevron Asphalt Plant and Terminal #1001067, Emeryville, California

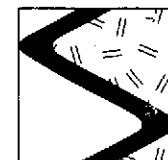
Well ID	Date Measured	DTW (ft)	TOC ¹ (ft)	GWE (msl)	Product Thickness ² (ft)	Screen Interval ³	Sand Pack Interval ³	Bentonite/Grout Interval ³
						-----feet below grade----->		
MW-1	4/13/89	3.72	10.67	6.95	---	1.5 - 11.5	1 - 12	0 - 1
	7/31/89	5.72		4.95	---			
	12/8/89	4.80		5.87	---			
	3/21/90	4.74		5.93	---			
	6/19/90	4.75		5.92	---			
	9/20/90	5.07		5.60	---			
	12/28/90	4.91		5.76	---			
	5/10/91	5.30		5.37	0			
	8/8/91	5.85		4.82	0			
11/27/91	5.13	5.54	0					
MW-2	4/13/89	2.62	13.78	11.16	---	2 - 12	1 - 12	0 - 1
	7/31/89	4.63		9.15	---			
	12/8/89	5.98		7.80	---			
	3/21/90	5.85		7.93	---			
	6/19/90	5.95		7.83	---			
	9/20/90	6.86		6.92	---			
	12/28/90	6.34		7.44	---			
	5/10/91	5.96		7.82	0			
	8/8/91	7.66		6.12	0			
11/27/91	8.04	5.74	0					
MW-3	4/13/89	2.34	11.73	9.39	---	2 - 12	1 - 12	0 - 1
	7/31/89	4.79	99.50 ¹	---	---			
	12/8/89	3.03	---	---				
	3/21/90	2.55	11.73	9.18	---			
	6/19/90	2.76	8.97	---				
	9/20/90	4.43	7.30	---				
	12/28/90	3.67	8.06	---				
	5/10/91	2.83	8.90	0				
	8/8/91	5.09	6.64	0				
11/27/91	5.37	6.36	0					



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Table 1. Water Level Data and Well Construction Details - Former Chevron Asphalt Plant and Terminal #1001067, Emeryville, California (continued)

Well ID	Date Measured	DTW (ft)	TOC (ft)	GWE (msl)	Product Thickness ² (ft)	Screen Interval ³	Sand Pack Interval ³	Bentonite/Grout Interval ³
						<-----feet below grade----->		
MW-4 ⁴	4/13/89	2.12	99.86	---	---	2 - 12	1 - 12	0 - 1
MW-5 ⁴	4/13/89	2.79	98.53	---	---	2 - 12	1 - 12	0 - 1
MW-6 ⁴	4/13/89	1.90	99.03	---	---	2 - 12	1 - 12	0 - 1
MW-7	4/13/89	1.90	10.47	8.57	---	2 - 12	1 - 12	0 - 1
	7/31/89	4.24		6.23	---			
	12/8/89	2.65		7.82	---			
	3/21/90	2.76		7.71	---			
	6/19/90	3.24		7.23	---			
	9/20/90	4.57		5.90	---			
	12/28/90	3.12		7.35	---			
	5/10/91	3.53		6.94	0			
	8/8/91	4.64		5.83	0			
	11/27/91	3.66		6.81	0			
MW-8	4/13/89	2.80	10.46	7.66	---	2 - 12	1 - 12	0 - 1
	7/31/89	5.70		4.76	---			
	12/8/89	4.13		6.33	---			
	3/21/90	4.07		6.39	---			
	6/19/90	4.25		6.21	---			
	9/20/90	4.99		5.47	---			
	12/28/90	4.39		6.07	---			
	5/10/91	4.13		6.33	0			
	8/8/91	5.53		4.93	0			
	11/27/91	4.59		5.87	0			
MW-9 ⁵	5/10/91	---	---	---	---	2 - 12	1 - 12	0 - 1



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Table 1. Water Level Data and Well Construction Details - Former Chevron Asphalt Plant and Terminal #1001067, Emeryville, California (continued)

Well ID	Date Measured	DTW (ft)	TOC (ft)	GWE (msl)	Product Thickness ² (ft)	Screen Interval ³	Sand Pack Interval ³	Bentonite/Grout Interval ³
						-----feet below grade----->		
MW-10	3/21/90	4.60	10.82	6.22	---	---	---	---
	6/19/90	4.89		5.93	---	---	---	
	9/20/90	5.77		5.05	---	---	---	
	12/28/90	4.99		5.83	---	---	---	
	5/10/91	5.80		5.02	0	---	---	
	8/8/91	5.86		4.96	0	---	---	
	11/27/91	5.39		5.43	0	---	---	
MW-11	3/21/90	4.82	11.38	6.56	---	---	---	---
	6/19/90	5.14		6.24	---	---	---	
	9/20/90	6.11		5.27	---	---	---	
	12/28/90	5.16		6.22	---	---	---	
	5/10/91	7.83		3.55	0	---	---	
	8/8/91	6.32		5.06	0	---	---	
	11/27/91	5.67		5.71	0	---	---	
MW-12	3/21/90	6.76	13.03	6.27	---	---	---	---
	6/19/90	6.62		6.41	---	---	---	
	9/20/90	5.00		8.03	---	---	---	
	12/28/90	6.62		6.41	---	---	---	
	5/10/91	6.48		6.55	0	---	---	
	8/8/91	8.01		5.02	0	---	---	
	11/27/91	7.95		5.08	0	---	---	
MW-13	3/21/90	4.08	11.15	7.07	---	7.5 - 12	7 - 12	0 - 7
	6/19/90	4.34		6.81	---	---	---	
	9/20/90	5.31		5.84	---	---	---	
	12/28/90	4.79		6.36	---	---	---	
	5/10/91	4.20		6.95	0	---	---	
	8/8/91	5.13		6.02	0	---	---	
	11/27/91	4.72		6.43	0	---	---	



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Table 1. Water Level Data and Well Construction Details - Former Chevron Asphalt Plant and Terminal #1001067, Emeryville, California (continued)

Well ID	Date Measured	DTW (ft)	TOC (ft)	GWE (msl)	Product Thickness ² (ft)	Screen Interval ³	Sand Pack Interval ³	Bentonite/Grout Interval ³
						<-----feet below grade----->		
MW-14	3/21/90	0.91	9.78	8.87	---	5 - 10	6.5 - 10	0 - 6.5
	6/19/90	1.03		8.75	---			
	9/20/90	2.53		7.25	---			
	12/28/90	1.61		8.17	---			
	5/10/91	1.22		8.56	0			
	8/8/91	2.45		7.33	0			
	11/27/91	2.59		7.19	0			
MW-15	3/21/90	4.72	11.01	6.29	---	5.5 - 10.5	5 - 10.5	0 - 5
	6/19/90	4.78		6.23	---			
	9/20/90	4.98		6.03	---			
	12/28/90	4.84		6.17	---			
	5/10/91	4.58		6.43	0			
	8/8/91	5.03		5.98	0			
	11/27/91	5.88		5.13	0			
MW-16	3/21/90	5.84	11.11	5.27	---	7 - 13.5	7 - 13.5	0 - 7
	6/19/90	5.90		5.21	---			
	9/20/90	6.36		4.75	---			
	12/28/90	5.98		5.13	---			
	5/10/91	5.89		5.22	0			
	8/8/91	6.28		4.83	0			
	11/27/91	5.62		5.49	0			
MW-17	3/21/90	5.61	10.41	4.80	---	4 - 12	3.5 - 12	0 - 3.5
	6/19/90	---		---	---			
	9/20/90	6.02		4.39	---			
	12/28/90	5.73		4.68	---			
	5/10/91	5.65		4.76	0			
	8/8/91	5.94		4.47	0			
	11/27/91	6.00		4.41	0			



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Table 1. Water Level Data and Well Construction Details - Former Chevron Asphalt Plant and Terminal #1001067, Emeryville, California (continued)

Well ID	Date Measured	DTW (ft)	TOC (ft)	GWE (msl)	Product Thickness ² (ft)	Screen Interval ³ Sand Pack Interval ³ Bentonite/Grout Interval ³			
						-----feet below grade----->			
MW-18	3/21/90	5.15	9.80	4.65	---	4 - 11	3.5 - 11	0 - 3.5	
	6/19/90	5.19		4.61					
	9/20/90	5.54		4.26					
	12/28/90	5.26		4.54					
	5/10/91	5.18		4.62					0
	8/8/91	5.45		4.35					0
	11/27/91	5.24		4.56					0
MW-19	3/21/90	5.00	8.45	3.45	---	5 - 9	4.5 - 9	0 - 4.5	
	6/19/90	5.06		3.39					
	9/20/90	5.25		3.20					
	12/28/90	5.07		3.38					
	5/10/91	5.02		3.43					0
	8/8/91	5.17		3.28					0
	11/27/91	5.06		3.39					0

EXPLANATION:

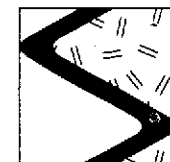
- DTW = Depth to water
- TOC = Top of casing elevation
- GWE = Ground water elevation
- msl = Measurements referenced relative to mean sea level
- = Not measured

NOTES:

¹ Top of casing elevations shown prior to 3/21/90 were surveyed to an arbitrary datum point set at 100 ft. The TOCs shown for dates prior to 3/21/90 were corrected using new TOC elevations which were surveyed to a USGS benchmark (relative to mean sea level) in April 1990.

NOTES: (continued)

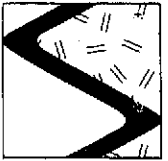
- ² Product thickness measurements were made using an MMC flex-dip interface probe. Product thickness information prior to May 10, 1991 was not available for inclusion in this report.
- ³ MW-1 through MW-9 well construction details are from March 12 and 13, 1985 boring logs by Gettler-Ryan Inc. of Hayward, California. Construction information for MW-10, MW-11 and MW-12 were not available for inclusion in this report. MW-13 through MW-19 well construction details are from the February 1 and 2, 1990 and March 21-23, 1990 boring logs by Western Geologic Resources, Inc., San Rafael, California.
- ⁴ Monitoring wells destroyed during soil excavation.
- ⁵ MW-9 was not measured because it could not be located. Previous water level data were not available for this well.



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Table 2. Analytic Results for Ground Water - Petroleum Hydrocarbons - Former Chevron Asphalt Plant and Terminal #1001067, Emeryville, California

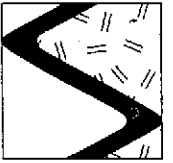
Well ID	Date Sampled	Analytic Lab	Analytic Method	TPPH(G)	B	T	E	X	O&G
				-----ppb-----					
MW-1	4/14/89	CCAS	8260	<5,000	34	<5	<5	<10	---
	7/31/89	CCAS	8260	7,000	57	1.2	<0.2	1.6	---
	12/8/89	GTEL	8015/8020	---	26	0.4	0.9	2	---
	3/21/90	GTEL	8015/8020	3,500	120	9	3	3	---
	6/19/90	GTEL	8015/8020	2,700	100	<0.3	<0.3	7	---
	9/21/90	GTEL	8015/8020	2,200	120	2	2	0.79	---
	12/28/90	SAL	8015/8020	720	44	2	<0.5	9	---
	5/10/91	SAL	8015/8020	530	47	2	0.5	8	---
	8/8/91	SAL	8015/8020	1,400	37	8.3	3.7	12	---
	11/27/91	SAL	8015/8020	840	16	7.1	4.5	11	---
MW-2	4/14/89	CCAS	8260	<100	<0.2	<0.2	<0.2	<0.4	<3,000
	7/31/89	CCAS	8260	<100	<0.2	<1.0	<0.2	<0.4	---
	12/8/89	GTEL	8015/8020	---	<0.3	<0.3	<0.3	<0.6	---
	3/21/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	6/19/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	9/21/90	GTEL	8015/8020	<50	<1.5	<1.5	<1.5	4.5	---
	12/28/90	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	5/10/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	8/8/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	11/27/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
MW-3	4/14/89	CCAS	8260	<100	<0.2	<0.2	<0.2	<0.4	<3,000
	7/31/89	CCAS	8260	<100	<0.2	<1.0	<0.2	<0.4	---
	12/8/89	GTEL	8015/8020	---	<0.3	<0.3	<0.3	<0.6	---
	3/21/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	6/19/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	9/21/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	12/28/90	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	5/10/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	8/8/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	11/27/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---



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Table 2. Analytic Results for Ground Water - Petroleum Hydrocarbons - Former Chevron Asphalt Plant and Terminal #1001067, Emeryville, California (continued)

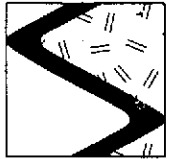
Well ID	Date Sampled	Analytic Lab	Analytic Method	TPPH(G)	B	T	E	X	O&G
				-----ppb-----					
MW-10	4/14/89	CCAS	8260	<50	<0.5	<1	<1	<1	<3,000
	7/31/89	CCAS	8260	<50	<0.1	<0.5	<0.1	<0.2	---
	12/8/89	GTEL	8015/8020	---	<0.3	<0.3	<0.3	<0.6	---
	3/21/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	6/19/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	9/21/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	12/28/90	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	5/10/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	8/8/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	11/27/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
MW-11	4/14/89	CCAS	8260	<50	<0.5	<1	<1	<1	<3,000
	7/31/89	CCAS	8260	<100	<0.2	<0.2	<0.2	<0.2	---
	12/8/89	GTEL	8015/8020	---	<0.3	<0.3	<0.3	<0.6	---
	3/21/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	6/19/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	9/21/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	12/28/90	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	5/10/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	8/8/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	11/27/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
MW-12	4/14/89	CCAS	8260	<50	<0.5	<1	<1	<1	<3,000
	7/31/89	CCAS	8260	<100	<0.1	<0.5	<0.1	<0.2	---
	12/8/89	GTEL	8015/8020	---	<0.3	<0.3	<0.3	<0.6	---
	3/21/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.3	---
	6/19/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.3	---
	9/21/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.3	---
	12/28/90	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	5/10/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	8/8/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	11/27/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---



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Table 2. Analytic Results for Ground Water - Petroleum Hydrocarbons - Former Chevron Asphalt Plant and Terminal #1001067, Emeryville, California (continued)

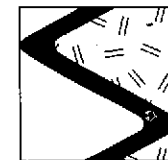
Well ID	Date Sampled	Analytic Lab	Analytic Method	TPPH(G)	B	T	E	X	O&G
				-----ppb-----					
MW-13	3/21/90	GTEL	8015/8020	480	<0.3	<0.3	1.0	5.0	---
	6/19/90	GTEL	8015/8020	180	<0.3	<0.3	0.8	3.0	---
	9/20/90	GTEL	8015/8020	150	<0.3	<0.3	<0.3	0.54	---
	12/28/90	SAL	8015/8020	160	<0.5	<0.5	<0.5	1	---
	5/10/91	SAL	8015/8020	110	<0.5	<0.5	<0.5	2	---
	8/8/91	SAL	8015/8020	220 ⁴	<0.5	<0.5	<0.5	1.8	---
	11/27/91	SAL	8015/8020	70	<0.5	<0.5	<0.5	1.2	---
MW-14	3/21/90	GTEL	8015/8020	170	<0.3	<0.3	<0.4	2.0	---
	6/19/90	GTEL	8015/8020	77	<0.3	<0.3	<0.3	<0.6	---
	9/20/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	12/28/90	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	5/10/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	8/8/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	11/27/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
MW-15	3/21/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	6/19/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	9/20/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	12/28/90	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	5/10/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	8/8/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	11/27/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
MW-16	3/21/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	6/19/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	9/20/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	12/28/90	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	5/10/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	8/8/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	11/27/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---



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Table 2. Analytic Results for Ground Water - Petroleum Hydrocarbons - Former Chevron Asphalt Plant and Terminal #1001067, Emeryville, California (continued)

Well ID	Date Sampled	Analytic Lab	Analytic Method	TPPH(G)	B	T	E	X	O&G
				-----ppb-----					
MW-17	3/21/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	6/19/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	9/20/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	12/28/90	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	5/10/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	0.8	---
	8/8/91	SAL	8015/8020	82	1.9	2.5	0.9	5.4	---
	11/27/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
MW-18	3/21/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	6/19/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	9/20/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	12/28/90	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	5/10/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	8/8/91	SAL	8015/8020	52	<0.5	<0.5	<0.5	<0.5	---
	11/27/91	SAL	8015/8020	<50	0.6	1.5	0.6	2.1	---
MW-19	3/21/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	6/19/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	9/20/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	12/28/90	SAL	8015/8020	66	<0.5	<0.5	<0.5	<0.5	---
	5/10/91	SAL	8015/8020	60 ¹	<0.5	<0.5	<0.5	<0.5	---
	8/8/91	SAL	8015/8020	58	<0.5	<0.5	<0.5	<0.5	---
	11/27/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
AA	4/14/89	CCAS	8260	<50	<0.5	<1	<1	<1	---
	7/31/89	CCAS	8260	<50	<0.1	<0.5	<0.5	<0.2	---
	12/8/89	GTEL	8015/8020	---	<0.3	<0.3	<0.3	<0.6	---
	3/21/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	3/26/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	6/19/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	9/21/90	GTEL	8015/8020	<50	<0.3	<0.3	<0.3	<0.6	---
	12/28/90	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.6	---



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Table 2. Analytic Results for Ground Water - Petroleum Hydrocarbons - Former Chevron Asphalt Plant and Terminal #1001067, Emeryville, California (continued)

Well ID	Date Sampled	Analytic Lab	Analytic Method	TPPH(G)	B	T	E	X	O&G
				-----ppb-----					
AA (cont)	5/10/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	8/8/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	11/27/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
BB	5/10/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	8/8/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---
	11/27/91	SAL	8015/8020	<50	<0.5	<0.5	<0.5	<0.5	---

EXPLANATION:

TPPH(G) = Total Purgeable Petroleum Hydrocarbons as Gasoline

B = Benzene

T = Toluene

E = Ethylbenzene

X = Xylenes

O&G = Oil and Grease

ppb = Parts per billion

--- = Not analyzed/Not applicable

AA = Travel Blank

BB = Bailor Blank

D = Duplicate Analysis

ANALYTIC METHODS:

8260 = Approved Variance for Method EPA 8240 using capillary column and GC/MS for TPHH and BTEX

8015 = EPA Method 8015 for TPHH (G)

8020 = EPA Method 8020 for BTEX

ANALYTIC LABORATORIES:

CCAS = Coast to Coast Analytical Services of San Luis Obispo, California

GTEL = Groundwater Technology Environmental Laboratory of Concord, California

SAL = Superior Analytical Laboratory of Martinez and San Francisco, California

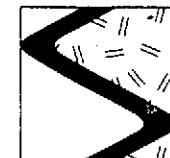
NOTES:

¹ TPHH as Diesel #2.

² Monitoring wells destroyed in 1989.

³ MW-9 was not sampled because it could not be located. Previous analytical data were not available for inclusion in this report.

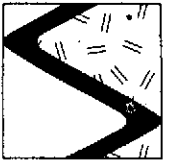
⁴ Does not match a typical gasoline pattern.



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Table 3. Analytic Results for Ground Water - Halogenated Volatile Organic Compounds - Former Chevron Asphalt Plant and Terminal #1001067, Emeryville, California

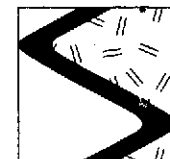
Well ID	Date Sampled	Analytic Lab	Analytic Method	1,1-	1,2-	t-1,2-	c-1,2-	1,1-	TCA	TCE	PCE	CF	VC	Other HVOCs
				DCE	DCE	DCE	DCE	DCA						
-----ppb-----														
MW-1	4/14/89	CCAS	8010	<5	19	---	720	<5	<5	11	<5	<20	340	ND ¹
	7/31/89	CCAS	8010	6.8	54	---	2,600	2.7	7.2	57	<0.2	<1	760	ND ²
	12/8/89	GTEL	8010	4.3	2,700	---	---	1.7	1.4	59	<0.5	<0.5	520	---
	3/21/90	GTEL	8010	7.1	7,000	---	---	2.1	1.1	130	<0.5	<0.5	1,100	---
	6/19/90	GTEL	8010	12	6,100	---	---	3.1	<0.5	81	<0.5	<0.5	1,200	---
	9/21/90	GTEL	8010	1.8	2,400	---	---	2.2	1.7	60	<0.5	<0.5	1,100	ND ³
	12/28/90	SAL	8010	2	---	28	1,500	1	0.6	15	<0.5	<0.5	510	ND ⁴
	5/10/91	SAL	8010	10	---	69	5,500	2	<0.5	280	<0.5	<0.5	1,800	ND ⁵
	8/8/91	SAL	8010	2.9	---	45	2,300	1.5	<0.5	110	<0.5	<0.5	<1	ND ⁶
	11/27/91	SAL	8010	<25	---	<25	5,900	<25	<25	<25	<25	<25	540	ND
MW-2	4/14/89	CCAS	8010	<0.2	<0.2	---	---	<0.2	<0.2	<0.2	<0.2	<1	<0.2	---
	7/31/89	CCAS	8010	<0.2	<0.2	---	---	<0.4	0.5	<0.2	<0.2	<1	<0.2	---
	12/8/89	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
	3/21/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	6/19/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	9/21/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	12/28/90	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	5/10/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND
	8/8/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND
	11/27/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND
MW-3	4/14/89	CCAS	8010	<0.2	<0.2	---	---	<0.2	<0.2	<0.2	<0.2	<1	<0.2	---
	7/31/89	CCAS	8010	<0.2	<0.2	---	---	<0.4	0.5	<0.2	<0.2	<1	<0.2	---
	12/8/89	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	3/21/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	6/19/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	9/21/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	12/28/90	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	5/10/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND
	8/8/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND
	11/27/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND
MW-4 ⁷	4/14/89	CCAS	8010	<1	<1	---	---	2	<1	<1	<1	<2	<1	---



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Table 3. Analytic Results for Ground Water - Halogenated Volatile Organic Compounds - Former Chevron Asphalt Plant and Terminal #1001067, Emeryville, California (continued)

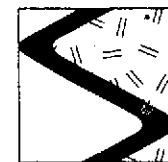
Well ID	Date Sampled	Analytic Lab	Analytic Method	1,1-	1,2-	t-1,2-	c-1,2-	1,1-	TCA	TCE	PCE	CF	VC	Other	
				DCE	DCE	DCE	DCE	DCA	ppb						
MW-5 ⁷	4/14/89	CCAS	8010	<1	<1	---	---	2	<1	<1	<1	<2	<1	---	
MW-6 ⁷	4/14/89	CCAS	8010	<1	<1	---	---	2	<1	<1	<1	<2	<1	---	
MW-7	4/14/89	CCAS	8010	<1	<1	---	---	1	1	<1	<1	<2	<1	---	
MW-7	7/31/89	CCAS	8010	<0.1	0.3	---	---	0.3	4.5	<0.1	<0.1	<0.5	<0.1	ND ⁸	
MW-7D	7/31/89	GTEL	8010	<0.1	0.4	---	---	0.2	2.6	<0.1	<0.1	<0.5	<0.1	ND ⁸	
MW-7	12/8/89	GTEL	8010	<0.2	<0.5	---	---	<0.5	0.67	<0.5	<0.5	<0.5	<1.0	---	
	3/21/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	1.4	<0.5	<0.5	<0.5	<1	---	
	6/19/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	0.67	<0.5	<0.5	<0.5	<1	---	
	9/21/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---	
	12/28/90	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	0.9	<0.5	<0.5	<0.5	<1	---	
	5/10/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND	
	8/8/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND	
	11/27/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND	
MW-8	4/14/89	CCAS	8010	<1	<1	---	---	<1	<1	<1	<1	<2	<1	---	
	7/31/89	CCAS	8010	<0.1	0.6	---	1.9	1.7	1.7	0.4	<0.1	<0.5	1.2	ND	
	12/8/89	GTEL	8010	<0.2	0.53	---	---	<0.5	0.84	<0.5	<0.5	<0.5	<1.0	---	
	3/21/90	GTEL	8010	<0.2	0.96	---	---	<0.5	0.72	<0.5	<0.5	<0.5	<1	---	
	6/19/90	GTEL	8010	<0.2	0.59	---	---	<0.5	0.67	<0.5	<0.5	<0.5	<1	---	
	9/21/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---	
	12/28/90	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	2	<0.5	<0.5	<0.5	<1	---	
	5/10/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND	
	8/8/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND	
	11/27/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND	
MW-9 ⁹	5/10/91	---	---	---	---	---	---	---	---	---	---	---	---	---	
	8/8/91	---	---	---	---	---	---	---	---	---	---	---	---	---	
	11/27/91	---	---	---	---	---	---	---	---	---	---	---	---	---	
MW-10	4/14/89	CCAS	8010	<1	15	---	---	2	<1	5	<1	<2	<1	---	
	7/31/89	CCAS	8010	0.7	6.3	---	27	2.9	<0.1	5.3	<0.1	<0.5	<0.1	ND	
	12/8/89	GTEL	8010	<0.2	24	---	---	3.1	<0.5	4.9	<0.5	0.6	<1.0	---	
	3/21/90	GTEL	8010	0.7	30	---	---	2.5	<0.5	3.5	<0.5	<0.5	<1	---	
	6/19/90	GTEL	8010	0.3	33	---	---	2.6	<0.5	6.3	<0.5	<0.5	<1	---	
	9/21/90	GTEL	8010	<0.2	32	---	---	5.0	<0.5	5.9	<0.5	<0.5	<1	---	



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Table 3. Analytic Results for Ground Water - Halogenated Volatile Organic Compounds - Former Chevron Asphalt Plant and Terminal #1001067, Emeryville, California (continued)

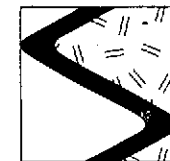
Well ID	Date Sampled	Analytic Lab	Analytic Method	1,1-	1,2-	t-1,2-	c-1,2-	1,1-	TCA	TCE	PCE	CF	VC	Other HVOCs
				DCE	DCE	DCE	DCE	DCA						
←-----ppb-----→														
MW-14	3/21/90	GTEL	8010	<2.0	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	6/19/90	GTEL	8010	<2.0	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	9/20/90	GTEL	8010	<2.0	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	12/28/90	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	5/10/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND
	8/8/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND
	11/27/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND
MW-15	3/21/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	6/19/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	9/20/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	12/28/90	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	5/10/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND ¹²
	8/8/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND
	11/27/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND
MW-16	3/21/90	GTEL	8010	<0.2	0.8	---	---	<0.5	<0.5	27	8	2	<1	---
	6/19/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	35	7	2	<1	---
	9/20/90	GTEL	8010	<0.2	0.9	---	---	<0.5	<0.5	49	15	4.1	<1	---
	12/28/90	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	29	18	4	<1	ND ¹³
	5/10/91	SAL	8010	<0.5	---	<0.5	0.5	<0.5	<0.5	32	10	4	<1	ND
	8/8/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	35	13	1.9	<1	ND
	11/27/91	SAL	8010	<0.5	---	<0.5	1.3	<0.5	<0.5	47	12	1.8	<1	ND ¹⁴
MW-17	3/21/90	GTEL	8010	<0.2	5.2	---	---	0.7	1.3	32	11	1.1	<1	---
	6/19/90	GTEL	8010	<0.2	3.1	---	---	<0.5	1.0	38	13	1.2	<1	---
	9/20/90	GTEL	8010	<0.2	2.4	---	---	<0.5	1.4	44	16	2.8	<1	---
	12/28/90	SAL	8010	<0.5	---	<0.5	2	<0.5	0.6	34	15	2	<1	---
	5/10/91	SAL	8010	<0.5	---	<0.5	3	<0.5	0.6	37	14	1	<1	ND
	8/8/91	SAL	8010	<0.5	---	<0.5	2.5	<0.5	<0.5	69	15	0.9	<1	ND
	11/27/91	SAL	8010	<0.5	---	<0.5	13	<0.5	<0.5	59	14	2.4	<1	ND



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Table 3. Analytic Results for Ground Water - Halogenated Volatile Organic Compounds - Former Chevron Asphalt Plant and Terminal #1001067, Emeryville, California (continued)

Well ID	Date Sampled	Analytic Lab	Analytic Method	1,1-	1,2-	t-1,2-	c-1,2-	1,1-	TCA	TCE	PCE	CF	VC	Other HVOCs
				DCE	DCE	DCE	DCE	DCA						
-----ppb-----														
MW-18	3/21/90	GTEL	8010	<0.2	1.7	---	---	<0.5	2.4	33	20	0.9	<1	---
	6/19/90	GTEL	8010	<0.2	2.7	---	---	<0.5	0.9	63	20	0.73	<1	---
	9/20/90	GTEL	8010	<0.2	3.3	---	---	<0.5	1.6	76	25	1.7	<1	---
	12/28/90	SAL	8010	<0.5	---	<0.5	2	<0.5	0.8	44	21	1	<1	---
	5/10/91	SAL	8010	<0.5	---	<0.5	2	<0.5	0.7	47	20	2	<1	ND
	8/8/91	SAL	8010	<0.5	---	<0.5	2	<0.5	0.7	32	25	1.0	<1	ND
	11/27/91	SAL	8010	<0.5	---	<0.5	3.6	<0.5	0.5	60	18	1.5	<1	ND
MW-19	3/21/90	GTEL	8010	<0.2	10	---	---	<0.5	2.5	41	53	3.2	<1	---
	6/19/90	GTEL	8010	<0.2	13	---	---	<0.5	1.5	46	47	2.8	<1	---
	9/20/90	GTEL	8010	<0.2	5.8	---	---	<0.5	2.5	39	32	3.1	<1	---
	12/28/90	SAL	8010	<0.5	---	0.8	22	<0.5	1	40	44	3	<1	---
	5/10/91	SAL	8010	<0.5	---	2	12	<0.5	1	47	47	3	<1	ND
	8/8/91	SAL	8010	<0.5	---	1.1	4.8	<0.5	1.1	41	35	2.8	<1	ND
	11/27/91	SAL	8010	<0.5	---	1.9	29	<0.5	0.9	59	31	2.7	<1	ND
AA	4/14/89	CCAS	8010	<1	<0.5	---	---	<1	<1	<1	<1	<2	<1	---
	7/31/89	CCAS	8010	<0.1	<0.5	---	---	<0.1	<0.1	<0.1	<0.1	<0.5	<0.1	---
	12/8/89	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	---
	3/21/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	3/26/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	6/19/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	9/21/90	GTEL	8010	<0.2	<0.5	---	---	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	12/28/90	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	---
	5/10/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND
	8/8/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND ¹⁴
	11/27/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND ¹⁶
BB	5/10/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND
	8/8/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND
	11/27/91	SAL	8010	<0.5	---	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	ND ¹⁶



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Table 3. Analytic Results for Ground Water - Halogenated Volatile Organic Compounds - Former Chevron Asphalt Plant and Terminal #1001067, Emeryville, California (continued)

EXPLANATION:

1,1-DCE = 1,1-Dichloroethene
1,2-DCE = 1,2-Dichloroethene
t-1,2-DCE = trans-1,2-Dichloroethene
c-1,2-DCE = cis-1,2-Dichloroethene
1,1-DCA = 1,1-Dichloroethane
TCA = 1,1,1-Trichloroethane
TCE = Trichloroethylene
PCE = Tetrachloroethene
CF = Chloroform
VC = Vinyl Chloride
Other HVOCs = Other Halogenated Volatile Organic Compounds
ppb = Parts per billion
--- = Not analyzed/not applicable
AA = Travel Blank
BB = Bailer Blank
ND = Not detected at detection limits of 0.5 to 1 ppb
D = Duplicate analysis

ANALYTIC METHOD:

8010 = EPA Method 8010 for Volatile Organic Compounds

ANALYTIC LABORATORIES:

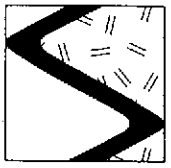
CCAS = Coast to Coast Analytical Services of San Luis Obispo, California
GTEL = Groundwater Technologies Environmental Laboratory of Concord, California
SAL = Superior Analytical Laboratory of Martinez and San Francisco, California

NOTES:

Historic analytic data was compiled from the Quarterly Groundwater Sampling report prepared for this service station by Western Geologic Resources, February 8, 1991.

Selected HVOCs were reported by WGR; it is unknown whether other HVOCs were detected in the samples.

- ¹ 6 ppb 1,2-dichloropropane detected; other HVOCs not detected.
- ² 0.6 ppb 1,2-dichloroethane detected; other HVOCs not detected.
- ³ 63 ppb chloromethane and 0.6 ppb methylene chloride detected; other HVOCs not detected; sample contained 1,250 ppb total dissolved solids.
- ⁴ 0.9 ppb trans-1,3-dichloropropane detected; other HVOCs not detected; sample contained 810 ppb total dissolved solids.
- ⁵ 0.9 ppb trichlorofluoromethane and 1 ppb trans-1,3-dichloropropane detected; other HVOCs not detected.
- ⁶ 11 ppb trans-1,3-dichloropropane detected; other HVOCs not detected.
- ⁷ Monitoring well destroyed during excavation.
- ⁸ 0.1 ppb 1,2-dichlorobenzene detected; other HVOCs not detected.
- ⁹ MW-9 was not sampled because it was buried. No previous analytic data was available for this well.
- ¹⁰ 1.8 ppb 1,2-dichloroethane detected; other HVOCs not detected
- ¹¹ 3 ppb 1,1,2,2-tetrachloroethane detected; other HVOCs not detected.
- ¹² 0.9 ppb 1,2-dichlorobenzene detected; other HVOCs not detected.
- ¹³ 0.5 ppb 1,2-dichloroethane detected; other HVOCs not detected.
- ¹⁴ 3.1 ppb 1,2-dichlorobenzene detected; other HVOCs not detected.
- ¹⁵ 0.9 ppb 1,2-dichloroethane detected; other HVOCs not detected.
- ¹⁶ Trace concentrations of trihalomethane compounds detected in blank water.



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APPENDIX C
SIERRA ENVIRONMENTAL SERVICES
STANDARD OPERATING PROCEDURES



SES STANDARD OPERATING PROCEDURE

GROUND WATER SAMPLING

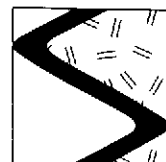
The following describes sampling procedures used by SES field personnel to collect and handle ground water samples. Before samples are collected, careful consideration is given to the type of analysis to be performed so that precautions are taken to prevent loss of volatile components or contamination of the sample, and to preserve the sample for subsequent analysis. Wells will be sampled no less than 24 hours after well development. Collection methods specific to ground water sampling are presented below.

Prior to sampling, each well is checked for the presence of free-phase hydrocarbons using an MMC flexi-dip interface probe. Product thickness (measured to the nearest 0.01 foot) is noted on the sampling form. Water level measurements are also made using either a water level meter or the interface probe. The water level measurements are also noted on the sampling form.

Prior to sampling, each well is purged of a minimum of four well casing volumes of water using a steam-cleaned PVC bailer, or a pre-cleaned pump. Temperature, pH and electrical conductivity are measured at least three times during purging. Purging is continued until these parameters have stabilized (i.e., changes in temperature, pH or conductivity do not exceed $\pm 0.5^{\circ}\text{F}$, 0.1 or 5%, respectively).

The purge water is stored temporarily on-site in 55-gallon Department of Transportation-approved drums pending analytic results. The drums are labeled with the date, contents, the SES field personnel initials and SES phone number.

Ground water samples are collected from the wells with steam-cleaned Teflon bailers. The water samples are decanted into the appropriate container for the analysis to be performed. Pre-preserved sample containers may be used or the analytic laboratory may add preservative to the sample upon arrival. Duplicate samples are collected from each well as a back-up sample and/or to provide quality control. The samples are labeled to include the project number, sample ID, date, preservative, and the field person's initials. The samples are placed in polyethylene bags and in an ice chest (maintained at 4°C with blue ice or ice) for transport under chain-of-custody to the laboratory.

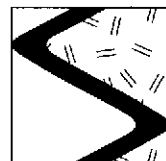


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The chain-of-custody form includes the project number, analysis requested, sample ID, date analysis and the SES field person's name. The form is signed and dated (with the transfer time) by each person who yields or receives the samples beginning with the field personnel and ending with the laboratory personnel.

A trip blank and bailer blank accompanies each sampling set, or 5% trip blanks and 5% bailer blanks are included for sets of greater than 20 samples. The bailer blank is prepared by pouring previously boiled water into a steam-cleaned Teflon bailer prior to sampling a well. The trip and bailer blanks are analyzed for some or all of the same compounds as the ground water samples.

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APPENDIX D
CHAIN OF CUSTODY DOCUMENT AND
LABORATORY ANALYTIC REPORTS



Superior Precision Analytical, Inc.

835 Arnold Drive, Suite 106 • Martinez, California 94553 • (510) 229-0166 / fax (510) 229-0916

Sierra Environmental
Attn: Sharon Halper

Project 1-191-04
Reported 05-December-1991

VOLATILE PETROLEUM HYDROCARBONS

Laboratory Number	Sample Identification	Matrix
20301- 1	MW-AA	Water
20301- 2	MW-BB	Water
20301- 3	MW-7	Water
20301- 4	MW-14	Water
20301- 5	MW-3	Water
20301- 6	MW-2	Water
20301- 7	MW-12	Water
20301- 8	MW-10	Water
20301- 9	MW-15	Water

RESULTS OF ANALYSIS

Laboratory Number:	20301- 1	20301- 2	20301- 3	20301- 4
--------------------	----------	----------	----------	----------

GASOLINE RANGE:	ND<50	ND<50	ND<50	ND<50
BENZENE:	ND<0.5	ND<0.5	ND<0.5	ND<0.5
TOLUENE:	ND<0.5	ND<0.5	ND<0.5	ND<0.5
ETHYL BENZENE:	ND<0.5	ND<0.5	ND<0.5	ND<0.5
TOTAL XYLENES:	ND<0.5	ND<0.5	ND<0.5	ND<0.5
Concentration:	ug/L	ug/L	ug/L	ug/L

Laboratory Number:	20301- 5	20301- 6	20301- 7	20301- 8	20301- 9
--------------------	----------	----------	----------	----------	----------

GASOLINE RANGE:	ND<50	ND<50	ND<50	ND<50	ND<50
BENZENE:	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5
TOLUENE:	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5
ETHYL BENZENE:	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5
TOTAL XYLENES:	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5
Concentration:	ug/L	ug/L	ug/L	ug/L	ug/L



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Sierra Environmental
Attn: Sharon Halper

Project 1-191-04
Reported 05-December-1991

VOLATILE PETROLEUM HYDROCARBONS

Laboratory Number	Sample Identification	Matrix
20301-10	MW-13	Water
20301-11	MW-8	Water
20301-12	MW-11	Water
20301-13	MW-17	Water
20301-14	MW-16	Water
20301-15	MW-19	Water
20301-16	MW-18	Water
20301-17	MW-1	Water

RESULTS OF ANALYSIS

Laboratory Number:	20301-10	20301-11	20301-12	20301-13	20301-14
--------------------	----------	----------	----------	----------	----------

GASOLINE RANGE:	70	ND<50	ND<50	ND<50	ND<50
BENZENE:	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5
TOLUENE:	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5
ETHYL BENZENE:	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5
TOTAL XYLENES:	1.2	ND<0.5	ND<0.5	ND<0.5	ND<0.5
Concentration:	ug/L	ug/L	ug/L	ug/L	ug/L

Laboratory Number:	20301-15	20301-16	20301-17
--------------------	----------	----------	----------

GASOLINE RANGE:	ND<50	ND<50	840
BENZENE:	ND<0.5	0.6	16
TOLUENE:	ND<0.5	1.5	7.1
ETHYL BENZENE:	ND<0.5	0.6	4.5
TOTAL XYLENES:	ND<0.5	2.1	11
Concentration:	ug/L	ug/L	ug/L



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VOLATILE PETROLEUM HYDROCARBONS Quality Assurance and Control Data Laboratory Number 20301

Documentation and original analytical data for analyses reported on this certificate are in a file at the laboratory. This information is most easily accessed by the laboratory number shown above.

Code	Sample	Results	Acceptable Limits
120491	Method Blank, VPH	ND	ND
120491	VPH CCS, 2 ppm	88%	85-115%
	Xck TPH 200ppm	NA	85-115%
120491	VPH Avg. Spike		
	Recovery, 40 ppb BTXE	105%	75-125%
	VPH Duplicate RPD	5%	<25%
120491	Method Blank, BTEX	ND	ND
120491	BTEX CCS, 20 ppb	100%	85-115%
	Xchk BTEX 0.020ppm	NA	85-115%
120491	BTEX Avg. Spike Recovery	94%	75-125%
	BTEX Duplicate RPD	5%	<25%

	Standards, 5 Point Calibration	Correlation Coefficient	Limit
050791	VPH	.998	>0.990
081391	Benzene	.999	>0.990
081391	Toluene	.998	>0.990
081391	Ethyl Benzene	.999	>0.990
081391	Xylenes	.999	>0.980

Definitions:

CCS = Continuing Calibration Standard
 Xck = External Check Standard
 ND = Not Detected
 PQL = Practical Quantitation Limit
 RPD = Relative Percent Difference

Practical Quantitation Limits:

	Soil (mg/kg)	Water (ug/L)
VPH	1	50
Benzene	0.005	0.5
Toluene	0.005	0.5
E. Benzene	0.005	0.5
Xylenes	0.005	0.5

QC File No. NA


 Senior Analyst



Superior Precision Analytical, Inc.

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CERTIFICATE OF ANALYSIS

LABORATORY NO: 20301
CLIENT: Sierra Environmental
PROJECT NO: 1-191-04

DATE SAMPLED : 11/27/91
DATE RECEIVED: 11/27/91
DATE REPORTED: 12/09/91

EPA SW-846 METHOD 8010 HALOGENATED VOLATILE ORGANICS

LAB#: 20301-1 (Analyzed: 12/04/91)
SAMPLE: MW-AA (Water)

ANALYTE	MDL (ug/L)	RESULT (ug/L)
Chloromethane/Vinyl Chloride	1.0	ND
Bromomethane/Chloroethane	1.0	ND
Trichlorofluoromethane	0.5	ND
1,1-Dichloroethene/Freon 113	0.5	ND
Dichloromethane	0.5	ND
trans-1,2-Dichloroethene	0.5	ND
1,1-Dichloroethane	0.5	ND
cis-1,2-Dichloroethene	0.5	ND
Chloroform	0.5	ND
1,1,1-Trichloroethane	0.5	ND
Carbon Tetrachloride	0.5	ND
1,2-Dichloroethane	0.5	ND
Trichloroethene (TCE)	0.5	ND
1,2-Dichloropropane	0.5	ND
Bromodichloromethane	0.5	ND
cis-1,3-Dichloropropene	0.5	ND
trans-1,3-Dichloropropene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Tetrachloroethene (PCE)	0.5	ND
Dibromochloromethane	0.5	0.67
Chlorobenzene	0.5	ND
Bromoform	0.5	3.9
1,1,2,2-Tetrachloroethane	0.5	ND
1,3-Dichlorobenzene	0.5	ND
1,4-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%

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Superior Precision Analytical, Inc.

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CERTIFICATE OF ANALYSIS

LABORATORY NO: 20301
CLIENT: Sierra Environmental
PROJECT NO: 1-191-04

DATE SAMPLED :11/27/91
DATE RECEIVED:11/27/91
DATE REPORTED:12/09/91

EPA SW-846 METHOD 8010 HALOGENATED VOLATILE ORGANICS

LAB#: 20301-2 (Analyzed:12/04/91)
SAMPLE: MW-BB (Water)

ANALYTE	MDL(ug/L)	RESULT(ug/L)
Chloromethane/Vinyl Chloride	1.0	ND
Bromomethane/Chloroethane	1.0	ND
Trichlorofluoromethane	0.5	ND
1,1-Dichloroethene/Freon 113	0.5	ND
Dichloromethane	0.5	ND
trans-1,2-Dichloroethene	0.5	ND
1,1-Dichloroethane	0.5	ND
cis-1,2-Dichloroethene	0.5	ND
Chloroform	0.5	0.6
1,1,1-Trichloroethane	0.5	ND
Carbon Tetrachloride	0.5	ND
1,2-Dichloroethane	0.5	ND
Trichloroethene (TCE)	0.5	ND
1,2-Dichloropropane	0.5	ND
Bromodichloromethane	0.5	0.7
cis-1,3-Dichloropropene	0.5	ND
trans-1,3-Dichloropropene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Tetrachloroethene (PCE)	0.5	ND
Dibromochloromethane	0.5	1.2
Chlorobenzene	0.5	ND
Bromoform	0.5	4.4
1,1,2,2-Tetrachloroethane	0.5	ND
1,3-Dichlorobenzene	0.5	ND
1,4-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%


Senior Analyst



Superior Precision Analytical, Inc.

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CERTIFICATE OF ANALYSIS

LABORATORY NO: 20301
CLIENT: Sierra Environmental
PROJECT NO: 1-191-04

DATE SAMPLED :11/27/91
DATE RECEIVED:11/27/91
DATE REPORTED:12/09/91


EPA SW-846 METHOD 8010 HALOGENATED VOLATILE ORGANICS

LAB#: 20301-17 (Analyzed:12/05/91)
SAMPLE: MW-1 (Water)

ANALYTE	MDL (ug/L)	RESULT (ug/L)
Chloromethane/Vinyl Chloride	50	540
Bromomethane/Chloroethane	50	ND
Trichlorofluoromethane	25	ND
1,1-Dichloroethene/Freon 113	25	ND
Dichloromethane	25	ND
trans-1,2-Dichloroethene	25	ND
1,1-Dichloroethane	25	ND
cis-1,2-Dichloroethene	25	5900
Chloroform	25	ND
1,1,1-Trichloroethane	25	ND
Carbon Tetrachloride	25	ND
1,2-Dichloroethane	25	ND
Trichloroethene (TCE)	25	ND
1,2-Dichloropropane	25	ND
Bromodichloromethane	25	ND
cis-1,3-Dichloropropene	25	ND
trans-1,3-Dichloropropene	25	ND
1,1,2-Trichloroethane	25	ND
Tetrachloroethene (PCE)	25	ND
Dibromochloromethane	25	ND
Chlorobenzene	25	ND
Bromoform	25	ND
1,1,2,2-Tetrachloroethane	25	ND
1,3-Dichlorobenzene	25	ND
1,4-Dichlorobenzene	25	ND
1,2-Dichlorobenzene	25	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%


Senior Analyst



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CERTIFICATE OF ANALYSIS

LABORATORY NO: 20301
CLIENT: Sierra Environmental
PROJECT NO: 1-191-04

DATE SAMPLED : 11/27/91
DATE RECEIVED: 11/27/91
DATE REPORTED: 12/09/91

EPA SW-846 METHOD 8010 HALOGENATED VOLATILE ORGANICS

LAB#: 20301-3 (Analyzed: 12/04/91)
SAMPLE: MW-7 (Water)

ANALYTE	MDL(ug/L)	RESULT(ug/L)
Chloromethane/Vinyl Chloride	1.0	ND
Bromomethane/Chloroethane	1.0	ND
Trichlorofluoromethane	0.5	ND
1,1-Dichloroethene/Freon 113	0.5	ND
Dichloromethane	0.5	ND
trans-1,2-Dichloroethene	0.5	ND
1,1-Dichloroethane	0.5	ND
cis-1,2-Dichloroethene	0.5	ND
Chloroform	0.5	ND
1,1,1-Trichloroethane	0.5	ND
Carbon Tetrachloride	0.5	ND
1,2-Dichloroethane	0.5	ND
Trichloroethene (TCE)	0.5	ND
1,2-Dichloropropane	0.5	ND
Bromodichloromethane	0.5	ND
cis-1,3-Dichloropropene	0.5	ND
trans-1,3-Dichloropropene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Tetrachloroethene (PCE)	0.5	ND
Dibromochloromethane	0.5	ND
Chlorobenzene	0.5	ND
Bromoform	0.5	ND
1,1,2,2-Tetrachloroethane	0.5	ND
1,3-Dichlorobenzene	0.5	ND
1,4-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%


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CLIENT: Sierra Environmental
PROJECT NO: 1-191-04

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EPA SW-846 METHOD 8010 HALOGENATED VOLATILE ORGANICS

LAB#: 20301-4 (Analyzed: 12/04/91)
SAMPLE: MW-14 (Water)

ANALYTE	MDL(ug/L)	RESULT(ug/L)
Chloromethane/Vinyl Chloride	1.0	ND
Bromomethane/Chloroethane	1.0	ND
Trichlorofluoromethane	0.5	ND
1,1-Dichloroethene/Freon 113	0.5	ND
Dichloromethane	0.5	ND
trans-1,2-Dichloroethene	0.5	ND
1,1-Dichloroethane	0.5	ND
cis-1,2-Dichloroethene	0.5	ND
Chloroform	0.5	ND
1,1,1-Trichloroethane	0.5	ND
Carbon Tetrachloride	0.5	ND
1,2-Dichloroethane	0.5	ND
Trichloroethene (TCE)	0.5	ND
1,2-Dichloropropane	0.5	ND
Bromodichloromethane	0.5	ND
cis-1,3-Dichloropropene	0.5	ND
trans-1,3-Dichloropropene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Tetrachloroethene (PCE)	0.5	ND
Dibromochloromethane	0.5	ND
Chlorobenzene	0.5	ND
Bromoform	0.5	ND
1,1,2,2-Tetrachloroethane	0.5	ND
1,3-Dichlorobenzene	0.5	ND
1,4-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%


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EPA SW-846 METHOD 8010 HALOGENATED VOLATILE ORGANICS

LAB#: 20301-5 (Analyzed: 12/04/91)
SAMPLE: MW-3 (Water)

ANALYTE	MDL (ug/L)	RESULT (ug/L)
Chloromethane/Vinyl Chloride	1.0	ND
Bromomethane/Chloroethane	1.0	ND
Trichlorofluoromethane	0.5	ND
1,1-Dichloroethene/Freon 113	0.5	ND
Dichloromethane	0.5	ND
trans-1,2-Dichloroethene	0.5	ND
1,1-Dichloroethane	0.5	ND
cis-1,2-Dichloroethene	0.5	ND
Chloroform	0.5	ND
1,1,1-Trichloroethane	0.5	ND
Carbon Tetrachloride	0.5	ND
1,2-Dichloroethane	0.5	ND
Trichloroethene (TCE)	0.5	ND
1,2-Dichloropropane	0.5	ND
Bromodichloromethane	0.5	ND
cis-1,3-Dichloropropene	0.5	ND
trans-1,3-Dichloropropene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Tetrachloroethene (PCE)	0.5	ND
Dibromochloromethane	0.5	ND
Chlorobenzene	0.5	ND
Bromoform	0.5	ND
1,1,2,2-Tetrachloroethane	0.5	ND
1,3-Dichlorobenzene	0.5	ND
1,4-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%


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EPA SW-846 METHOD 8010 HALOGENATED VOLATILE ORGANICS

LAB#: 20301-6 (Analyzed: 12/04/91)
SAMPLE: MW-2 (Water)

ANALYTE	MDL (ug/L)	RESULT (ug/L)
Chloromethane/Vinyl Chloride	1.0	ND
Bromomethane/Chloroethane	1.0	ND
Trichlorofluoromethane	0.5	ND
1,1-Dichloroethene/Freon 113	0.5	ND
Dichloromethane	0.5	ND
trans-1,2-Dichloroethene	0.5	ND
1,1-Dichloroethane	0.5	ND
cis-1,2-Dichloroethene	0.5	ND
Chloroform	0.5	ND
1,1,1-Trichloroethane	0.5	ND
Carbon Tetrachloride	0.5	ND
1,2-Dichloroethane	0.5	ND
Trichloroethene (TCE)	0.5	ND
1,2-Dichloropropane	0.5	ND
Bromodichloromethane	0.5	ND
cis-1,3-Dichloropropene	0.5	ND
trans-1,3-Dichloropropene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Tetrachloroethene (PCE)	0.5	ND
Dibromochloromethane	0.5	ND
Chlorobenzene	0.5	ND
Bromoform	0.5	ND
1,1,2,2-Tetrachloroethane	0.5	ND
1,3-Dichlorobenzene	0.5	ND
1,4-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%


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EPA SW-846 METHOD 8010 HALOGENATED VOLATILE ORGANICS

LAB#: 20301-7 (Analyzed:12/04/91)
SAMPLE: MW-12(Water)

ANALYTE	MDL(ug/L)	RESULT(ug/L)
Chloromethane/Vinyl Chloride	1.0	ND
Bromomethane/Chloroethane	1.0	ND
Trichlorofluoromethane	0.5	ND
1,1-Dichloroethene/Freon 113	0.5	ND
Dichloromethane	0.5	ND
trans-1,2-Dichloroethene	0.5	ND
1,1-Dichloroethane	0.5	ND
cis-1,2-Dichloroethene	0.5	ND
Chloroform	0.5	ND
1,1,1-Trichloroethane	0.5	ND
Carbon Tetrachloride	0.5	ND
1,2-Dichloroethane	0.5	ND
Trichloroethene (TCE)	0.5	ND
1,2-Dichloropropane	0.5	ND
Bromodichloromethane	0.5	ND
cis-1,3-Dichloropropene	0.5	ND
trans-1,3-Dichloropropene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Tetrachloroethene (PCE)	0.5	ND
Dibromochloromethane	0.5	ND
Chlorobenzene	0.5	ND
Bromoform	0.5	ND
1,1,2,2-Tetrachloroethane	0.5	ND
1,3-Dichlorobenzene	0.5	ND
1,4-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%


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EPA SW-846 METHOD 8010
HALOGENATED VOLATILE ORGANICS

LAB#: 20301-8 (Analyzed:12/05/91)
SAMPLE: MW-10(Water)

ANALYTE	MDL(ug/L)	RESULT(ug/L)
Chloromethane/Vinyl Chloride	5.0	ND
Bromomethane/Chloroethane	5.0	ND
Trichlorofluoromethane	2.5	ND
1,1-Dichloroethene/Freon 113	2.5	ND
Dichloromethane	2.5	ND
trans-1,2-Dichloroethene	2.5	6.8
1,1-Dichloroethane	2.5	ND
cis-1,2-Dichloroethene	2.5	100
Chloroform	2.5	ND
1,1,1-Trichloroethane	2.5	ND
Carbon Tetrachloride	2.5	ND
1,2-Dichloroethane	2.5	ND
Trichloroethene (TCE)	2.5	8.5
1,2-Dichloropropane	2.5	ND
Bromodichloromethane	2.5	ND
cis-1,3-Dichloropropene	2.5	ND
trans-1,3-Dichloropropene	2.5	ND
1,1,2-Trichloroethane	2.5	ND
Tetrachloroethene (PCE)	2.5	ND
Dibromochloromethane	2.5	ND
Chlorobenzene	2.5	ND
Bromoform	2.5	ND
1,1,2,2-Tetrachloroethane	2.5	ND
1,3-Dichlorobenzene	2.5	ND
1,4-Dichlorobenzene	2.5	ND
1,2-Dichlorobenzene	2.5	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%


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EPA SW-846 METHOD 8010
HALOGENATED VOLATILE ORGANICS

LAB#: 20301-9 (Analyzed: 12/05/91)
SAMPLE: MW-15 (Water)

ANALYTE	MDL (ug/L)	RESULT (ug/L)
Chloromethane/Vinyl Chloride	1.0	ND
Bromomethane/Chloroethane	1.0	ND
Trichlorofluoromethane	0.5	ND
1,1-Dichloroethene/Freon 113	0.5	ND
Dichloromethane	0.5	ND
trans-1,2-Dichloroethene	0.5	ND
1,1-Dichloroethane	0.5	ND
cis-1,2-Dichloroethene	0.5	ND
Chloroform	0.5	ND
1,1,1-Trichloroethane	0.5	ND
Carbon Tetrachloride	0.5	ND
1,2-Dichloroethane	0.5	ND
Trichloroethene (TCE)	0.5	ND
1,2-Dichloropropane	0.5	ND
Bromodichloromethane	0.5	ND
cis-1,3-Dichloropropene	0.5	ND
trans-1,3-Dichloropropene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Tetrachloroethene (PCE)	0.5	ND
Dibromochloromethane	0.5	ND
Chlorobenzene	0.5	ND
Bromoform	0.5	ND
1,1,2,2-Tetrachloroethane	0.5	ND
1,3-Dichlorobenzene	0.5	ND
1,4-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%

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EPA SW-846 METHOD 8010
HALOGENATED VOLATILE ORGANICS

LAB#: 20301-10 (Analyzed: 12/05/91)
SAMPLE: MW-13 (Water)

ANALYTE	MDL (ug/L)	RESULT (ug/L)
Chloromethane/Vinyl Chloride	1.0	ND
Bromomethane/Chloroethane	1.0	ND
Trichlorofluoromethane	0.5	ND
1,1-Dichloroethene/Freon 113	0.5	ND
Dichloromethane	0.5	ND
trans-1,2-Dichloroethene	0.5	ND
1,1-Dichloroethane	0.5	ND
cis-1,2-Dichloroethene	0.5	ND
Chloroform	0.5	ND
1,1,1-Trichloroethane	0.5	ND
Carbon Tetrachloride	0.5	ND
1,2-Dichloroethane	0.5	ND
Trichloroethene (TCE)	0.5	ND
1,2-Dichloropropane	0.5	ND
Bromodichloromethane	0.5	ND
cis-1,3-Dichloropropene	0.5	ND
trans-1,3-Dichloropropene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Tetrachloroethene (PCE)	0.5	ND
Dibromochloromethane	0.5	ND
Chlorobenzene	0.5	ND
Bromoform	0.5	ND
1,1,2,2-Tetrachloroethane	0.5	ND
1,3-Dichlorobenzene	0.5	ND
1,4-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%


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EPA SW-846 METHOD 8010
HALOGENATED VOLATILE ORGANICS

LAB#: 20301-11 (Analyzed: 12/05/91)
SAMPLE: MW-8 (Water)

ANALYTE	MDL (ug/L)	RESULT (ug/L)
Chloromethane/Vinyl Chloride	1.0	ND
Bromomethane/Chloroethane	1.0	ND
Trichlorofluoromethane	0.5	ND
1,1-Dichloroethene/Freon 113	0.5	ND
Dichloromethane	0.5	ND
trans-1,2-Dichloroethene	0.5	ND
1,1-Dichloroethane	0.5	ND
cis-1,2-Dichloroethene	0.5	ND
Chloroform	0.5	ND
1,1,1-Trichloroethane	0.5	ND
Carbon Tetrachloride	0.5	ND
1,2-Dichloroethane	0.5	ND
Trichloroethene (TCE)	0.5	ND
1,2-Dichloropropane	0.5	ND
Bromodichloromethane	0.5	ND
cis-1,3-Dichloropropene	0.5	ND
trans-1,3-Dichloropropene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Tetrachloroethene (PCE)	0.5	ND
Dibromochloromethane	0.5	ND
Chlorobenzene	0.5	ND
Bromoform	0.5	ND
1,1,2,2-Tetrachloroethane	0.5	ND
1,3-Dichlorobenzene	0.5	ND
1,4-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%



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EPA SW-846 METHOD 8010 HALOGENATED VOLATILE ORGANICS

LAB#: 20301-12 (Analyzed:12/05/91)
SAMPLE: MW-11 (Water)

ANALYTE	MDL(ug/L)	RESULT(ug/L)
Chloromethane/Vinyl Chloride	20	ND
Bromomethane/Chloroethane	20	ND
Trichlorofluoromethane	10	ND
1,1-Dichloroethene/Freon 113	10	ND
Dichloromethane	10	ND
trans-1,2-Dichloroethene	10	34
1,1-Dichloroethane	10	ND
cis-1,2-Dichloroethene	10	240
Chloroform	10	ND
1,1,1-Trichloroethane	10	ND
Carbon Tetrachloride	10	ND
1,2-Dichloroethane	10	ND
Trichloroethene (TCE)	10	ND
1,2-Dichloropropane	10	ND
Bromodichloromethane	10	ND
cis-1,3-Dichloropropene	10	ND
trans-1,3-Dichloropropene	10	ND
1,1,2-Trichloroethane	10	ND
Tetrachloroethene (PCE)	10	ND
Dibromochloromethane	10	ND
Chlorobenzene	10	ND
Bromoform	10	ND
1,1,2,2-Tetrachloroethane	10	ND
1,3-Dichlorobenzene	10	ND
1,4-Dichlorobenzene	10	ND
1,2-Dichlorobenzene	10	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%


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EPA SW-846 METHOD 8010
HALOGENATED VOLATILE ORGANICS

LAB#: 20301-13 (Analyzed: 12/05/91)
SAMPLE: MW-17 (Water)

ANALYTE	MDL (ug/L)	RESULT (ug/L)
Chloromethane/Vinyl Chloride	5.0	ND
Bromomethane/Chloroethane	5.0	ND
Trichlorofluoromethane	2.5	ND
1,1-Dichloroethene/Freon 113	2.5	ND
Dichloromethane	2.5	ND
trans-1,2-Dichloroethene	2.5	ND
1,1-Dichloroethane	2.5	ND
cis-1,2-Dichloroethene	2.5	13
Chloroform	2.5	2.4
1,1,1-Trichloroethane	2.5	ND
Carbon Tetrachloride	2.5	ND
1,2-Dichloroethane	2.5	ND
Trichloroethene (TCE)	2.5	59
1,2-Dichloropropane	2.5	ND
Bromodichloromethane	2.5	ND
cis-1,3-Dichloropropene	2.5	ND
trans-1,3-Dichloropropene	2.5	ND
1,1,2-Trichloroethane	2.5	ND
Tetrachloroethene (PCE)	2.5	14
Dibromochloromethane	2.5	ND
Chlorobenzene	2.5	ND
Bromoform	2.5	ND
1,1,2,2-Tetrachloroethane	2.5	ND
1,3-Dichlorobenzene	2.5	ND
1,4-Dichlorobenzene	2.5	ND
1,2-Dichlorobenzene	2.5	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%


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EPA SW-846 METHOD 8010 HALOGENATED VOLATILE ORGANICS

LAB#: 20301-14 (Analyzed:12/05/91)
SAMPLE: MW-16 (Water)

ANALYTE	MDL (ug/L)	RESULT (ug/L)
Chloromethane/Vinyl Chloride	1.0	ND
Bromomethane/Chloroethane	1.0	ND
Trichlorofluoromethane	0.5	ND
1,1-Dichloroethene/Freon 113	0.5	ND
Dichloromethane	0.5	ND
trans-1,2-Dichloroethene	0.5	ND
1,1-Dichloroethane	0.5	ND
cis-1,2-Dichloroethene	0.5	1.3
Chloroform	0.5	1.8
1,1,1-Trichloroethane	0.5	ND
Carbon Tetrachloride	0.5	ND
1,2-Dichloroethane	0.5	0.9
Trichloroethene (TCE)	0.5	47
1,2-Dichloropropane	0.5	ND
Bromodichloromethane	0.5	ND
cis-1,3-Dichloropropene	0.5	ND
trans-1,3-Dichloropropene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Tetrachloroethene (PCE)	0.5	12
Dibromochloromethane	0.5	ND
Chlorobenzene	0.5	ND
Bromoform	0.5	ND
1,1,2,2-Tetrachloroethane	0.5	ND
1,3-Dichlorobenzene	0.5	ND
1,4-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%


Senior Analyst



Superior Precision Analytical, Inc.

835 Arnold Drive, Suite 106 • Martinez, California 94553 • (510) 229-0166 / fax (510) 229-0916

CERTIFICATE OF ANALYSIS

LABORATORY NO: 20301
CLIENT: Sierra Environmental
PROJECT NO: 1-191-04

DATE SAMPLED : 11/27/91
DATE RECEIVED: 11/27/91
DATE REPORTED: 12/09/91

EPA SW-846 METHOD 8010
HALOGENATED VOLATILE ORGANICS

LAB#: 20301-15 (Analyzed: 12/05/91)
SAMPLE: MW-19 (Water)

ANALYTE	MDL (ug/L)	RESULT (ug/L)
Chloromethane/Vinyl Chloride	1.0	ND
Bromomethane/Chloroethane	1.0	ND
Trichlorofluoromethane	0.5	ND
1,1-Dichloroethene/Freon 113	0.5	ND
Dichloromethane	0.5	ND
trans-1,2-Dichloroethene	0.5	1.9
1,1-Dichloroethane	0.5	ND
cis-1,2-Dichloroethene	0.5	29
Chloroform	0.5	2.7
1,1,1-Trichloroethane	0.5	0.9
Carbon Tetrachloride	0.5	ND
1,2-Dichloroethane	0.5	ND
Trichloroethene (TCE)	0.5	59
1,2-Dichloropropane	0.5	ND
Bromodichloromethane	0.5	ND
cis-1,3-Dichloropropene	0.5	ND
trans-1,3-Dichloropropene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Tetrachloroethene (PCE)	0.5	31
Dibromochloromethane	0.5	ND
Chlorobenzene	0.5	ND
Bromoform	0.5	ND
1,1,2,2-Tetrachloroethane	0.5	ND
1,3-Dichlorobenzene	0.5	ND
1,4-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%


Senior Analyst



Superior Precision Analytical, Inc.

835 Arnold Drive, Suite 106 • Martinez, California 94553 • (510) 229-0166 / fax (510) 229-0916

CERTIFICATE OF ANALYSIS

LABORATORY NO: 20301
CLIENT: Sierra Environmental
PROJECT NO: 1-191-04

DATE SAMPLED : 11/27/91
DATE RECEIVED: 11/27/91
DATE REPORTED: 12/09/91

EPA SW-846 METHOD 8010
HALOGENATED VOLATILE ORGANICS

LAB#: 20301-16 (Analyzed: 12/05/91)
SAMPLE: MW-18 (Water)

ANALYTE	MDL (ug/L)	RESULT (ug/L)
Chloromethane/Vinyl Chloride	1.0	ND
Bromomethane/Chloroethane	1.0	ND
Trichlorofluoromethane	0.5	ND
1,1-Dichloroethene/Freon 113	0.5	ND
Dichloromethane	0.5	ND
trans-1,2-Dichloroethene	0.5	ND
1,1-Dichloroethane	0.5	ND
cis-1,2-Dichloroethene	0.5	3.6
Chloroform	0.5	1.5
1,1,1-Trichloroethane	0.5	0.5
Carbon Tetrachloride	0.5	ND
1,2-Dichloroethane	0.5	ND
Trichloroethene (TCE)	0.5	60
1,2-Dichloropropane	0.5	ND
Bromodichloromethane	0.5	ND
cis-1,3-Dichloropropene	0.5	ND
trans-1,3-Dichloropropene	0.5	ND
1,1,2-Trichloroethane	0.5	ND
Tetrachloroethene (PCE)	0.5	18
Dibromochloromethane	0.5	ND
Chlorobenzene	0.5	ND
Bromoform	0.5	ND
1,1,2,2-Tetrachloroethane	0.5	ND
1,3-Dichlorobenzene	0.5	ND
1,4-Dichlorobenzene	0.5	ND
1,2-Dichlorobenzene	0.5	ND

MDL: Method Detection Limit
* Confirmed on second column.

QA/QC Summary: For Water Matrix (12/05/91)
MS/MSD Average Recovery: 84%
MS/MSD %RPD: 1%

Robin Paulson
Senior Analyst

✓ copy of Lab Report and COC to Chevron Contact: Yes No

Chain-of-Custody-Record

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

Chevron Facility Number # 1001067
Facility Address 1520 POWELL ST, EMERYVILLE
Consultant Project Number 1-191-04
Consultant Name SIERRA ENVIRONMENTAL SERVICES
Address P.O. BOX 2546, MARTINEZ
Project Contact (Name) SHARON HALPER
(Phone) (510) 370-1289 (Fax Number) (510) 370-7959

Chevron Contact (Name) LUCIA CHOU
(Phone) (510) 842-9655
Laboratory Name SUPERIOR PRECISION ANALYTICAL
Laboratory Release Number 5334010
Samples Collected by (Name) ARGY MENA
Collection Date 27 NOV. 1991
Signature [Handwritten Signature]

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite D = Discrete	Time	Sample Preservation	Iced (Yes or No)	Analyses To Be Performed										Remarks				
								BTX + TPH GAS (8020 + 8015)	TPH Diesel (8015)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd, Cr, Pb, Zn, Ni (ICAP or AA)							
MW-AA		4000	W	G	13:00	HCL	Y	✓				✓									ANALYZE IN ORDER	
MW-BB		6			13:00																	
MW-7					16:00																	
MW-14					14:08																	
MW-3					14:20																	
MW-2					13:15																	
MW-12					14:45																	
MW-10					15:40																	
MW-15					15:00																	
MW-13					15:30																	
MW-8					14:40																	
MW-11					15:15																	
MW-17					14:17																	
MW-16					14:56																	

Please initial:
Samples Stored _____
Appropriate _____
Samples _____
_____ with _____
Comments _____

[Handwritten initials and signature]

Relinquished By (Signature) <i>[Handwritten Signature]</i>	Organization <i>[Handwritten]</i>	Date/Time <i>27 NOV '91</i>	Received By (Signature) <i>[Handwritten Signature]</i>	Organization <i>[Handwritten]</i>	Date/Time <i>27 NOV '91</i>	Turn Around Time (Circle Choice) 24 Hrs. 48 Hrs. <u>5 Days</u> 10 Days As Contracted
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time	
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature) <i>[Handwritten Signature]</i>	Organization	Date/Time <i>11/27/91</i>	

100-310000-21, 21, 21, 21

Fax copy of Lab Report and COC to Chevron Contact: Yes No

P.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 # 1001067
Facility Address 1520 POWELL ST, EMERYVILLE
Consultant Project Number 1-191-04
Consultant Name SIERRA ENVIRONMENTAL SERVICES
Address P.O. BOX 2546, MARTINEZ
Project Contact (Name) SHARON HALPER
(Phone) (510) 370-1280 (Fax Number) (510) 370-7959

Chevron Contact (Name) LUCIA CHOI
(Phone) (510) 842-9655
Laboratory Name SUPERIOR PRECISION ANALYTICAL
Laboratory Release Number 5334010
Samples Collected by (Name) ARGY MENA
Collection Date 27 NOV. 1991
Signature Argy Mena

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite D = Discrete	Time	Sample Preservation	Iced (Yes or No)	Analyses To Be Performed											Remarks	
								BTEX + TPH GAS (8020 + 8015)	TPH Diesel (8015)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd, Cr, Pb, Zn, Ni (ICAP or AA)					
MW-19		40 mL	W	G	11:44	HCL	Y	✓				✓								ANALYZE IN
MW-18		↓	↓	↓	11:00	↓	↓	↓				↓								ORDER
MW-1		↓	↓	↓	12:38	↓	↓	↓				↓								↓

Please indicate:
 Samples Stored: ✓
 Appropriate Samples: ✓
 VOC's: ✓
 Conditions: ✓

Relinquished By (Signature) <u>Argy Mena</u>	Organization <u>SES</u>	Date/Time <u>1827</u> <u>27 NOV 91</u>	Received By (Signature) <u>[Signature]</u>	Organization <u>[Signature]</u>	Date/Time <u>[Signature]</u>	Turn Around Time (Circle Choice) 24 Hrs. 48 Hrs. <u>5 Days</u> 10 Days As Contracted
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time	
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature) <u>[Signature]</u>	Date/Time <u>1827</u> <u>11/27/91</u>		

COC-3.DWG/03 91/HCH