



## Chevron U.S.A. Products Company

2410 Camino Ramon, San Ramon, California • Phone (510) 842-9500  
Mail Address: P.O. Box 5004, San Ramon, CA 94583-0804

Operations

March 3, 1993

Mr. Barney M. Chan  
Alameda County Health Care Services  
Department of Environmental Health  
80 Swan Way, Room 200  
Oakland, CA 94621

**Re: Chevron Service Station #9-0076  
4265 Foothill Boulevard, Oakland, CA**

Dear Mr. Chan:

Enclosed is the Groundwater Monitoring and Sampling Activities report dated February 4, 1993, prepared by our consultant Groundwater Technology, Inc. for the above referenced site. As indicated in the report, groundwater samples collected were analyzed for total petroleum hydrocarbons as gasoline (TPH-g) and BTEX. Benzene was detected only in monitor wells C-1, C-2, C-4, C-6, and C-7 at concentrations of 9.1, 14000, 7000, 1600, and 7600 ppb, respectively.

Depth to groundwater was measured at approximately 19 to 26 feet below grade on-site and 38 feet off-site. The monitoring data presented in the enclosed report has not been contoured on the potentiometric surface map because of the uncertainty of the hydrogeology of the site.

Our consultant is preparing a work plan for an enhanced in-situ bioremediation remedial approach for the removal of dissolved hydrocarbons from monitor well C-2. The approach involves injecting air at low flow rates to increase the amount of oxygen available for aerobic biodegradation. This approach has been chosen for two reasons. It is apparent from data gathered from the operation of the existing ground water extraction system that flow rates and hydrocarbon removal rates are extremely low due to the tight lithology found beneath the site. Secondly, given the recent data obtained from the monitor well installed at the adjacent Shell site and the uncertainty of responsibility for ground water contamination in Chevron's monitor wells C-6 and C-7, this option will be technically feasible and cost-effective until final responsibility is determined and a more thorough remedial approach can be composed.

Chevron will continue to monitor and sample all wells at this site on a quarterly basis.

If you have any questions or comments, please do not hesitate to contact me at (510) 842-8134.

Very truly yours,  
CHEVRON U.S.A. PRODUCTS COMPANY

Mark A. Miller  
Site Assessment and Remediation Engineer

Enclosure

cc: Mr. Rich Hiatt, RWQCB - Bay Area  
Mr. Mike Cook, Weiss Associates  
Mr. S.A. Willer  
File (9-0076 QM3)



# GROUNDWATER TECHNOLOGY, INC.

4057 Port Chicago Highway, Concord, CA 94520 (415) 671-2387

FAX: (415) 685-9148

February 4, 1993

Job No. 020302227

Mr. Mark Miller  
Chevron U.S.A. Products Company  
2410 Camino Ramon  
San Ramon, CA 94583-0804

**SUBJECT: GROUNDWATER MONITORING AND SAMPLING ACTIVITIES  
CHEVRON SERVICE STATION NO. 9-0076  
4265 FOOTHILL BLVD., OAKLAND, CALIFORNIA**

Dear Mr. Miller:

Groundwater Technology, Inc. presents the attached quarterly groundwater monitoring and sampling data collected on January 8, 1993. Eight groundwater monitoring wells at this site were gauged to determine depth to groundwater (DTW) and to check for separate-phase hydrocarbons. A separate-phase hydrocarbon sheen was detected in groundwater monitoring well C-2. A potentiometric surface map (Figure 1) and a summary of groundwater monitoring data (Table 1) are presented in Attachments A and B, respectively. After measuring the DTW, each monitoring well was purged and sampled. The groundwater samples were analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX), and total petroleum hydrocarbons (TPH)-as-gasoline. Results of the chemical analyses are summarized in Table 1. The laboratory report and chain-of-custody record are included in Attachment C. Monitoring well purge water was transported by Groundwater Technology, Inc. to the Chevron terminal in Richmond, California for recycling.

Groundwater Technology is pleased to assist Chevron on this project. If you have any questions or comments, please call our Concord, California office at (510) 671-2387.

Sincerely,  
Groundwater Technology, Inc.  
Written/Submitted by

  
SANDRA L. LINDSEY  
Project Manager

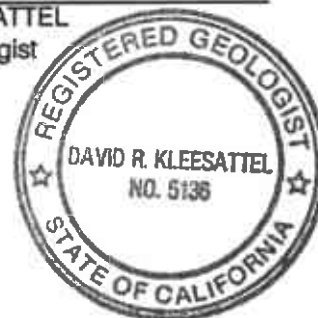
Groundwater Technology, Inc.  
Reviewed/Approved by

  
DAVID R. KLEESATTEL  
Registered Geologist  
No. 5136

Attachments: Attachment A - Figure 1  
Attachment B - Table 1  
Attachment C - Laboratory Report

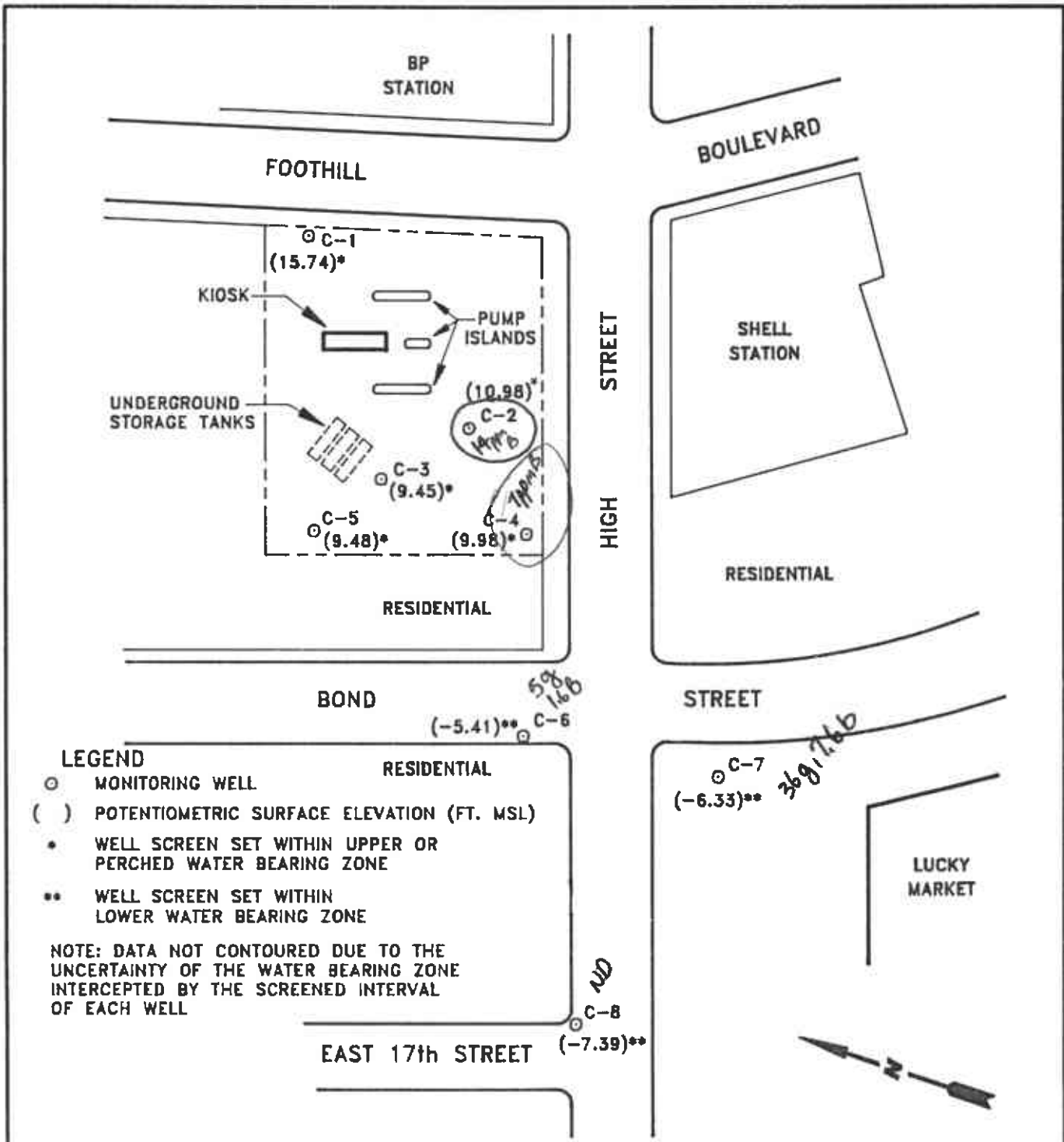
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For:  
John Gaines V.P.  
General Manager  
West Region



**ATTACHMENT A**

**FIGURE 1**



- LEGEND**
- MONITORING WELL
  - ( ) POTENTIOMETRIC SURFACE ELEVATION (FT. MSL)
  - \* WELL SCREEN SET WITHIN UPPER OR PERCHED WATER BEARING ZONE
  - \*\* WELL SCREEN SET WITHIN LOWER WATER BEARING ZONE

NOTE: DATA NOT CONTOURED DUE TO THE UNCERTAINTY OF THE WATER BEARING ZONE INTERCEPTED BY THE SCREENED INTERVAL OF EACH WELL

**GROUNDWATER TECHNOLOGY** 4057 PORT CHICAGO HWY  
CONCORD, CA 94520  
(510) 671-2387

**POTENTIOMETRIC SURFACE MAP (1/8/93)**

CLIENT: CHEVRON U.S.A. PRODUCTS Co. SERVICE STATION No. 9-0076		LOCATION: 4265 FOOTHILL BLVD. OAKLAND, CALIFORNIA		REV. NO.: 0	DATE: 2/8/93
PM: JAW	PE/RG: DRK	DESIGNED: TW	DETAILED: ML	ACAD FILE: PSM1893/SP392	PROJECT NO.: 020302227
					FIGURE: 1

**ATTACHMENT B**

**TABLE 1**

**TABLE 1  
HISTORICAL GROUNDWATER ANALYTICAL RESULTS AND MONITORING DATA  
CHEVRON SERVICE STATION NO. 9-0076  
4265 FOOTHILL BOULEVARD, OAKLAND, CALIFORNIA**

WELL ID/ ELEV	DATE	TPH-AS- GASOLINE	BENZENE	TOLUENE	ETHYL- BENZENE	XYLENE S	DTW (ft)	SPT (ft)	WTE (ft)
C-1  35.42	04/28/89a	940	30	1.8	11	13	20.05	0.00	15.37
	08/08/89a	820	45	2	13	13	24.07	0.00	11.35
	12/21/89	--	--	--	--	--	22.81	0.00	12.61
	08/27/90	440	15	1	6	13	22.12	0.00	13.30
	11/04/90	--	--	--	--	--	25.56	0.00	9.86
	06/18/91	74	5.6	0.6	1.9	1.3	21.64	0.00	13.78
	09/19/91	150	7.1	<0.5	2.3	3	24.58	0.00	10.64
	12/20/91	250	10	<0.5	3.7	1.6	26.17	0.00	9.25
	03/18/92	190	16	<0.5	8.5	2.9	18.25	0.00	17.17
	07/14/92	20,000	480	2,200	510	2,900	27.61	0.00	7.81
	10/08/92	360	34	4.6	19	12	24.44	0.00	10.98
01/08/93	120	9.1	0.5	5.1	1.8	19.68	0.00	15.74	
C-2  35.18	04/28/89a	120,000	30,000	22,000	3,000	17,000	26.44	0.00	8.74
	08/08/89a	--	--	--	--	--	29.90	0.01	5.29
	12/21/89	--	--	--	--	--	29.32	0.00	5.86
	08/27/90	--	--	--	--	--	29.55	0.17	5.77
	11/04/90	--	--	--	--	--	30.47	0.00	4.71
	06/18/91	--	--	--	--	--	28.33	0.06	6.90
	09/19/91	--	--	--	--	--	29.39	0.06	5.84
	12/20/91	170,000	20,000	10,000	2,800	18,000	29.23	0.00	5.95
	03/18/92	--	--	--	--	--	13.60	0.09	21.58
	07/14/92	--	--	--	--	--	--	--	--
	10/08/92	--	--	--	--	--	--	--	--
01/08/93	79,000	14,000	7,200	3,500	16,000	24.20	SHEEN	10.98	

**TABLE 1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS AND MONITORING DATA**  
**CHEVRON SERVICE STATION NO. 9-0076**  
**4265 FOOTHILL BOULEVARD, OAKLAND, CALIFORNIA**

WELL ID/ ELEV	DATE	TPH AS GASOLINE	BENZENE	TOLUENE	ETHYL- BENZENE	XYLENE S	DTW (ft)	SPT (ft)	WTE (ft)
C-3  35.28  35.30	04/28/89a	<500	1.7	<0.5	<0.5	<0.5	28.00	0.00	7.28
	08/08/89a	<500	1	<0.5	<0.5	<0.5	30.00	0.00	5.28
	12/21/89	—	—	—	—	—	30.53	0.00	4.75
	08/27/90	<50	<0.3	<0.3	<0.3	<0.6	29.68	0.00	5.60
	11/04/90	—	—	—	—	—	30.36	0.00	4.94
	06/18/91	52	1.1	<0.5	<0.5	1.2	28.46	0.00	6.84
	09/19/91	73	1.2	<0.5	<0.5	<0.5	29.33	0.00	5.97
	12/20/91	<50	0.7	<0.5	<0.5	<0.5	29.77	0.00	5.53
	03/18/92	<50	<0.5	<0.5	<0.5	<0.5	25.75	0.00	9.55
	07/14/92	<50	<0.5	<0.5	<0.5	<0.5	27.87	0.00	7.43
	10/08/92	<50	<0.5	<0.5	<0.5	0.5	28.55	0.00	6.75
	01/08/93	<50	<0.5	<0.5	<0.5	<0.5	25.85	0.00	9.45
	C-4  33.45  33.48	01/12/89a	—	—	—	—	—	29.49	0.00
04/12/89a		—	—	—	—	—	27.44	0.00	6.01
04/28/89		20,000	6,300	550	230	1,500	29.49	0.00	3.96
08/08/89a		8,000	7,500	340	88	1,000	29.55	0.00	3.90
12/21/89		—	—	—	—	—	30.02	0.00	3.43
08/27/90		26,000	10,000	280	410	1,400	29.02	0.00	4.46
11/04/90		—	—	—	—	—	29.81	0.00	3.67
06/18/91		34,000	14,000	410	450	1,300	27.45	0.00	6.03
09/19/91		16,000	7,400	90	110	460	28.65	0.00	4.83
12/20/91		24,000	12,000	120	260	740	28.84	0.00	4.64
03/18/92		48,000	6,000	1,300	1,300	2,400	24.43	0.00	11.05
07/14/92		40,000	14,000	920	550	2,400	26.89	0.00	6.59
10/08/92		29,000	13,000	190	110	1,400	27.79	0.00	5.69
01/08/93	25,000	7,000	630	860	1,800	23.50	0.00	9.98	



**TABLE 1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS AND MONITORING DATA**  
**CHEVRON SERVICE STATION NO. 9-0076**  
**4265 FOOTHILL BOULEVARD, OAKLAND, CALIFORNIA**

WELL ID/ ELEV	DATE	TPH-AS- GASOLINE	BENZENE	TOLUENE	ETHYL- BENZENE	XYLENE S	DTW (ft)	SPT (ft)	WTE (ft)
C-5  35.50	08/27/90	<50	<0.3	<0.3	<0.3	<0.6	29.83	0.00	5.67
	11/14/90	—	—	—	—	—	30.56	0.00	4.94
	06/18/91	<50	<0.5	<0.5	<0.5	<0.5	28.52	0.00	6.98
	09/19/91	<50	<0.5	<0.5	<0.5	<0.5	29.51	0.00	5.99
	12/20/91	<50	<0.5	<0.5	<0.5	<0.5	29.96	0.00	5.54
	03/18/92	<50	<0.5	<0.5	<0.5	<0.5	25.92	0.00	9.58
	07/14/92	<50	<0.5	<0.5	<0.5	<0.5	28.00	0.00	7.50
	10/08/92	<50	<0.5	<0.5	<0.5	<0.5	28.65	0.00	6.85
	01/08/93	<50	<0.5	<0.5	<0.5	<0.5	26.02	0.00	9.48
C-6  32.40	08/27/90	7,200	2,100	6	41	300	44.11	0.00	-11.71
	11/14/90	—	—	—	—	—	44.03	0.00	-11.63
	06/18/91	4,400	2,500	18	160	77	43.49	0.00	-11.09
	09/19/91	3,100	1,600	8.3	73	8	34.32	0.00	-1.92
	12/20/91	4,400	1,300	3.2	74	10	41.35	0.00	-8.95
	03/18/92	9,800	3,200	34	250	500	40.69	0.00	-8.29
	07/14/92	6,500	2,200	100	96	240	38.89	0.00	-6.49
	10/08/92	1,800	1,000	3.1	15	41	38.67	0.00	-6.27
	01/08/93	5,200	1,600	6.8	63	120	37.81	0.00	-5.41
C-7  32.17	08/27/90	110	26	0.8	4	6	44.23	0.00	-12.06
	11/14/90	—	—	—	—	—	44.11	0.00	-11.94
	06/18/91	23,000	5,700	420	1,000	2,800	42.05	0.00	-9.88
	09/19/91	26,000	4,600	330	970	2,400	41.72	0.00	-9.55
	12/20/91	33,000	5,500	270	1,000	2,100	41.67	0.00	-9.50
	03/18/92	27,000	5,800	410	1,300	3,300	41.20	0.00	-9.03
	07/14/92	46,000	12,000	720	1,700	4,600	39.77	0.00	-7.60
	10/08/92	22,000	6,800	370	1,300	3,200	39.14	0.00	-6.97
	01/08/93	36,000	7,600	540	1,700	4,200	38.50	0.00	-6.33

**TABLE 1**  
**HISTORICAL GROUNDWATER ANALYTICAL RESULTS AND MONITORING DATA**  
**CHEVRON SERVICE STATION NO. 9-0076**  
**4265 FOOTHILL BOULEVARD, OAKLAND, CALIFORNIA**

WELL ID/ ELEV	DATE	TPH-AS- GASOLINE	BENZENE	TOLUENE	ETHYL- BENZENE	XYLENE S	DTW (ft)	SPT (ft)	WTE (ft)
C-8  30.68	11/14/90	<50	<0.3	<0.3	<0.3	<0.6	43.29	0.00	-12.61
	06/18/91	<50	<0.5	<0.5	<0.5	<0.5	42.62	0.00	-11.94
	09/19/91	<50	<0.5	<0.5	<0.5	<0.5	41.72	0.00	-11.04
	12/20/91	<50	<0.5	<0.5	<0.5	<0.5	40.98	0.00	-10.30
	03/18/92	<50	<0.5	<0.5	<0.5	<0.5	40.02	0.00	-9.34
	07/14/92	<50	<0.5	<0.5	<0.5	<0.5	39.02	0.00	-8.34
	10/08/92	<50	<0.5	<0.5	<0.5	1.1	38.68	0.00	-8.00
	01/08/93	<50	<0.5	<0.5	<0.5	<0.5	38.07	0.00	-7.39
TRIP BLANK	04/28/89	<500	<0.5	<0.5	<0.5	<0.5	---	---	---
	08/08/89	<500	<0.5	<0.5	<0.5	<0.5	---	---	---
	08/27/90	<50	<0.3	<0.3	<0.3	<0.6	---	---	---
	11/14/90	<50	<0.3	<0.3	<0.3	<0.6	---	---	---
	06/18/91	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
	09/19/91	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
	12/20/91	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
	03/18/92	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
	07/14/92	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
	10/08/92	<50	<0.5	<0.5	<0.5	<0.5	---	---	---
01/08/93	<50	<0.5	<0.5	<0.5	<0.5	---	---	---	

— = Not applicable, not sampled, not measured  
DTW = Depth to groundwater  
SPT = Separate-phase hydrocarbon thickness  
WTE = Water table elevation  
a = Water elevations measured to grade

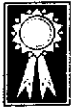
All elevations are given as feet above mean sea level.

Analytical results in micrograms per liter  $\mu/L$ , or parts per billion

Top of casing surveyed 1/03/90 and 08/21/90

Data from 4/28/89 through 12/20/91 taken from Fourth Quarter 1991 Ground Water Monitoring Report dated January 30, 1992, (Weiss Associates).

**ATTACHMENT C**  
**LABORATORY ANALYTICAL REPORT**



# Superior Precision Analytical, Inc.

825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

GROUNDWATER TECHNOLOGY, INC.  
Attn: Sandra Lindsey

Project 02030-2227  
Reported 01/18/93  
Revised 02/04/93

## TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed Matrix
87582- 1	TBLB	01/08/93	01/14/93 Water
87582- 2	RBC5	01/08/93	01/14/93 Water
87582- 3	C5	01/08/93	01/13/93 Water
87582- 5	C8	01/08/93	01/13/93 Water
87582- 7	C3	01/08/93	01/13/93 Water
87582- 9	C1	01/08/93	01/13/93 Water
87582-11	C6	01/08/93	01/14/93 Water
87582-13	C4	01/08/93	01/13/93 Water
87582-15	C7	01/08/93	01/13/93 Water
87582-16	C2	01/08/93	01/13/93 Water

## RESULTS OF ANALYSIS

Laboratory Number:	87582- 1	87582- 2	87582- 3	87582- 5	87582- 7
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Gasoline:	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
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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Laboratory Number:	87582- 9	87582-11	87582-13	87582-15	87582-16
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Gasoline:	120	5200	25000	36000	79000
Benzene:	9.1	1600	7000	7600	14000
Toluene:	0.5	6.8	630	540	7200
Ethyl Benzene:	5.1	63	860	1700	3500
Xylenes:	1.8	120	1800	4200	16000

Concentration:	ug/L	ug/L	ug/L	ug/L	ug/L
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# Superior Precision Analytical, Inc.

825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

## C E R T I F I C A T E   O F   A N A L Y S I S

### ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS

Page 2 of 2  
QA/QC INFORMATION  
SET: 87582

NA = ANALYSIS NOT REQUESTED  
ND = ANALYSIS NOT DETECTED ABOVE QUANTITATION LIMIT  
ug/L = parts per billion (ppb)

OIL AND GREASE ANALYSIS By Standard Methods Method 5520F:  
Minimum Detection Limit in Water: 5000ug/L

Modified EPA SW-846 Method 8015 for Extractable Hydrocarbons:  
Minimum Quantitation Limit for Diesel in Water: 50ug/L

EPA SW-846 Method 8015/5030 Total Purgable Petroleum Hydrocarbons:  
Minimum Quantitation Limit for Gasoline in Water: 50ug/L

EPA SW-846 Method 8020/BTXE  
Minimum Quantitation Limit in Water: 0.5ug/L

ANALYTE	SPIKE LEVEL	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Gasoline:	200 ng	99/100	1	70-130
Benzene:	200 ng	86/87	1	70-130
Toluene:	200 ng	94/95	1	70-130
Ethyl Benzene:	200 ng	101/102	1	70-130
Xylenes:	600 ng	99/100	2	70-130

Richard Srna, Ph.D.  
*Nancy A. Nelson for*  
Laboratory Director

