

July 12, 2004

JUL 20 2004

**GROUNDWATER MONITORING REPORT**  
**2<sup>nd</sup> Quarter, 2004**

3635 13th Avenue  
Oakland, California

AEI Project No. 6906

Prepared For

Mr. John Williamson  
1511 Wellington Street  
Oakland, CA 94602

Prepared By

**AEI Consultants**  
2500 Camino Diablo, Suite 200  
Walnut Creek, CA 94597  
(925) 283-6000

**AEI**



July 12, 2004

Mr. John Williamson  
1511 Wellington Street  
Oakland, CA 94602

**Subject: Groundwater Monitoring Report  
2<sup>nd</sup> Quarter, 2004  
3635 13th Avenue  
Oakland, California  
AEI Project No. 6906  
ACHCSA Case No. RO0000159**

Dear Mr. Williamson:

AEI Consultants (AEI) has prepared this report on behalf of your behalf to document the required ongoing groundwater investigation at the above referenced property (Figure 1: Site Location Map). The investigation is being performed at the request of the Alameda County Health Care Services Agency (ACHCSA). The purpose of the groundwater monitoring and sampling activities is to further evaluate the release of petroleum hydrocarbons that occurred from the former underground storage tank (UST) and fuel dispensing system on the property. This report documents the monitoring and sampling event performed during the second quarter episode, which occurred on April 6, 2004.

## I Background

The subject property (hereinafter referred to as the "site" or "property") is located in a residential area of the City of Oakland, on the west corner of 13<sup>th</sup> Avenue and Excelsior Street. The site is approximately 4,000 square feet in size and is currently vacant and un-improved. The site is surrounded by fencing. The site was previously developed with a gasoline service station.

In December 1992, three underground storage tanks (USTs), one 250-gallon waste oil UST, one 500-gallon gasoline UST, and one 1,000-gallon gasoline UST were removed by Aqua Science Engineers, Inc. of San Ramon. Refer to Figure 2 for the former locations of the USTs. Soil samples collected beneath the former waste oil UST revealed concentrations of 8,200 mg/kg Total Oil and Grease (TOG), 290 mg/kg Total Petroleum Hydrocarbons (TPH) as gasoline (TPH-g), and 225 mg/kg total lead. Soil samples collected from beneath the 1,000-gallon gasoline UST indicated maximum concentrations of 27 mg/kg TPH-g and 5.5 mg/kg benzene. Only minor concentrations of TPH as gasoline and benzene, toluene, ethylbenzene, and total xylenes (BTEX) were found in samples collected beneath the 500-gallon gasoline UST <sup>(1)</sup>.

In September 1993, AEI removed and disposed of approximately 360 cubic yards of contaminated soil from near the former waste oil UST. Sidewall samples collected from this excavation indicated that only minor contaminant concentrations remained in the soil. Following this project, the former 250-gallon waste oil UST was concluded to not pose a significant threat to the groundwater <sup>(2)</sup>.

Three monitoring wells (MW-1 through MW-3) were installed in March 1994 <sup>(3)</sup>. Soil samples analyzed during the well installations contained only minor concentration of petroleum hydrocarbons. The wells were monitored on a quarterly basis from November 1994 to August 1995, when the ACHCSA approved a change in monitoring frequency to a biannual schedule. Historical water elevations and groundwater sample analytical data is presented in Table 1.

On November 16, 1995, AEI advanced a soil boring at each end of the former dispenser island to depths of 4.5 feet below ground surface (bgs) on the west end, and 10 feet bgs on the east. Soil samples were collected beneath the former dispensers at the request of the ACHCSA. Analysis of soil samples collected from the two borings indicated that concentrations of TPH-g and BTEX were below laboratory detection limits <sup>(4)</sup>.

At the request of the ACHCSA, AEI prepared a workplan outlining a scope of work to further define the extent of impacted soil and groundwater beneath the site <sup>(5)</sup>. This investigation was performed between August 1997 and January 1998. Nine soil borings (SB1 through SB9) were advanced on the property and down-gradient of the former gasoline USTs <sup>(6)</sup>. Refer to Figure 2 for the locations of the borings. Groundwater sample analytical data is presented in Table 3 and soil sample analytical data in Table 4. The investigation revealed significant concentrations of contaminants in soil and groundwater and that the release had spread off-site in a southerly direction.

An additional workplan was prepared, outlining the installation of two additional groundwater monitoring wells <sup>(7)</sup>. However, due to the City of Oakland's requirement for liability insurance provided by the property owner for the wells, off-site monitoring wells could not be installed. A letter addendum to the workplan was prepared and approved to investigate the offsite extent of the release with temporary soil borings <sup>(8)</sup>. Soil and groundwater samples were collected from six additional soil borings (SB-10 to SB-15) between August and October 2003, the results of which were presented in the *Soil and Groundwater Investigation Report*, dated October 30, 2003.

## II Summary of Activities

AEI measured depth to groundwater in the three monitoring wells (MW-1 to MW-3) on April 6, 2004. The depth from the top of the well casings was measured with an electric water level indicator prior to sampling. The wells were purged with a submersible pump. Temperature, pH, specific conductivity, and oxidation-reduction potential (ORP) were measured during the purging of the wells. Turbidity was visually noted. The wells were purged of at least 3 well volumes

prior and allowed to recharge prior to sample collection. Once water levels recharged to at least 90% or their original levels, a water sample was collected from each well.

Water samples were collected with new, disposable bailers into 40-ml volatile organic analysis (VOA) vials and 1-liter amber bottles and capped so that no headspace or air bubbles were visible within the sample containers. Samples were delivered on ice under chain of custody protocol to McCampbell Analytical, Inc. of Pacheco, California (Department of Health Services Certification #1644).

Groundwater samples were submitted for chemical analysis for the following:

- Total Petroleum Hydrocarbons (TPH) as gasoline (TPH-g) by EPA method 8015Cm
- TPH as diesel (TPH-d) by EPA method 8015C
- Benzene, toluene, ethyl benzene, and xylenes (BTEX) and methyl tertiary butyl ether (MTBE) by EPA method 8021
- Fuel Additives [MTBE, di-isopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), tertiary butyl alcohol (TBA), 1,2-Dibromoethane (EDB), 1,2-Dichloroethane (1,2-DCA), ethanol, and methanol] by EPA method 8260B.

### III Field Results

No sheen or free product was encountered during monitoring activities. Groundwater levels for the current monitoring episode ranged from 183.83 to 188.15 feet above Mean Sea Level (MSL). These groundwater elevations were an average of 3.37 feet higher than the previous monitoring episode, which occurred on October 10, 2003. Based on these water level measurements, groundwater was calculated to flow in a southerly direction, with a gradient of 0.05 ft/ft.

Groundwater elevation data is summarized in Table 1. The groundwater elevation contours and the groundwater flow direction are shown in Figure 3. Refer to Appendix A for the Groundwater Monitoring Well Field Sampling Forms.

### IV Groundwater Quality

The highest concentrations of hydrocarbons were detected again in MW-2. TPH-g and TPH-d were detected in this well at 6,900 µg/l and 1,300 µg/l, respectively. Benzene and MTBE were detected in this well at 1,100 µg/l and 87 µg/l, respectively. TPH-g, TPH-d, benzene, and MTBE were not detected in wells MW-1 or MW-3 above laboratory detection limits. TBA was the only other target fuel additive detected (MW-2 at 110 µg/l).

A summary of groundwater quality data is presented in Table 1 and 2. Laboratory results and chain of custody documents are included in Appendix B.

## **V Summary and Recommendations**

The groundwater sample analytical data obtained during this event indicates that dissolved hydrocarbon concentrations have somewhat decreased. However, due to the lack of consistent and regular monitoring, it is unclear whether this is a long-term trend or a seasonal occurrence. AEI is recommending that quarterly monitoring be reinstated for one year, during which time, trends should become more apparent. Due to the lack of fuel additives in MW-1 and MW-3, analysis by EPA method 8260 will be limited to MW-2, to confirm the presence of MTBE and TBA in this well.

As requested by the ACHCSA, AEI has prepared a remedial investigation and interim corrective action plan to address remaining source area contamination. This is presented under separate cover.

## **VI References**

1. *Underground Storage Tank Removal Final Report*, January 20, 1993 – Aqua Science Engineers, Inc.
2. *Contaminated Soil Over-excavation Final Report*, November 18, 1999 – All Environmental, Inc.
3. *Soil Boring and Monitoring Well Installation Report*, December 14, 1994 – All Environmental, Inc.
4. *Phase II Limited Subsurface Investigation*, December 11, 1995 – All Environmental, Inc.
5. *Phase II Subsurface Investigation Workplan*, June 5, 1997 – All Environmental, Inc.
6. *Phase II Subsurface Investigation Report*, January 20, 1999 – All Environmental, Inc.
7. *Workplan*, December 3, 1999 – AEI Consultants
8. Letter to Amir Gholami of the ACHCSA, September 9, 2002 – AEI Consultants
9. *Soil and Groundwater Investigation Report*, October 30, 2003 – AEI Consultants

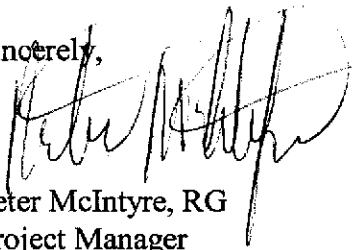
## **VII Report Limitation**

This report presents a summary of work completed by AEI Consultants. The completed work includes observations and descriptions of site conditions encountered. Where appropriate, it includes analytical results for samples taken during the course of the work. The number and location of samples are chosen to provide the required information, but it cannot be assumed that they are representative of areas not sampled. All conclusions and/or recommendations are based on these analyses and observations, and the governing regulations. Conclusions beyond those stated and reported herein should not be inferred from this document.

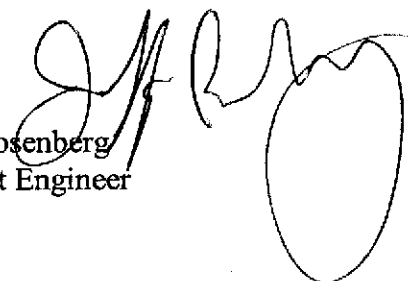
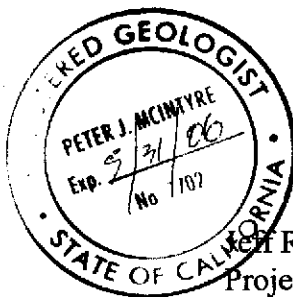
These services were performed in accordance with generally accepted practices, in the environmental engineering and construction field, which existed at the time and location of the work.

If you have any questions regarding our investigation, please do not hesitate to contact me at (925) 283-6000, extension 104.

Sincerely,



Peter McIntyre, RG  
Project Manager



Jeff Rosenberg  
Project Engineer

**Figures**

*Figure 1: Site Location Map*

*Figure 2: Site Plan*

**Tables**

*Table 1: Groundwater Levels*

*Table 2: Groundwater Sample Analytical Data*

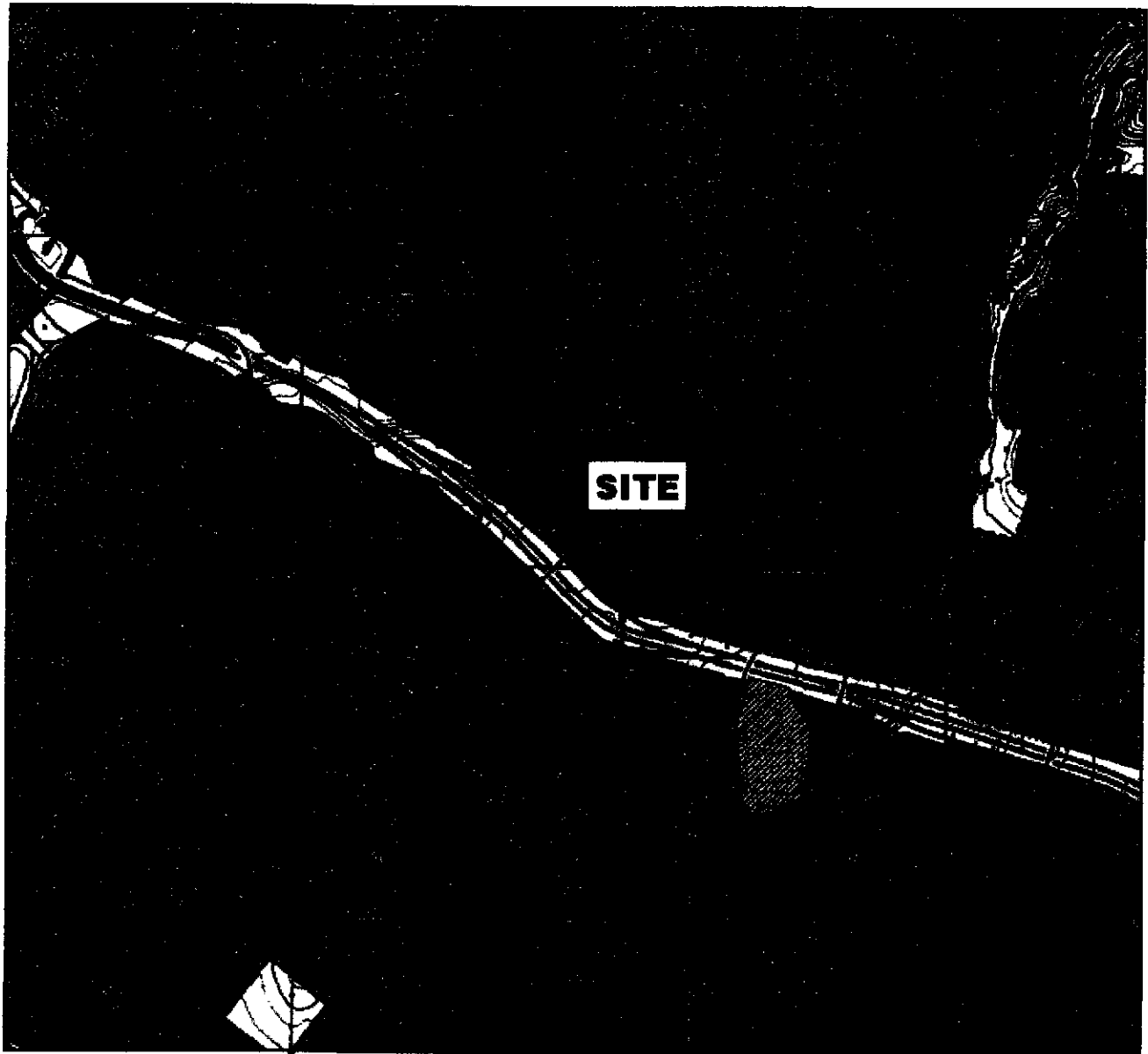
**Attachments**

*Appendix A: Groundwater Monitoring Well Field Sampling Forms*

*Appendix B: Laboratory Analyses With Chain of Custody Documentation*

Distribution: Mr. John Williamson  
1511 Wellington Street, Oakland, CA 94602

Mr. Amir Gholami, ACHCSA  
1131 Harbor Bay Parkway, Suite 250, Alameda, CA 94502



TN\* / MN  
15°



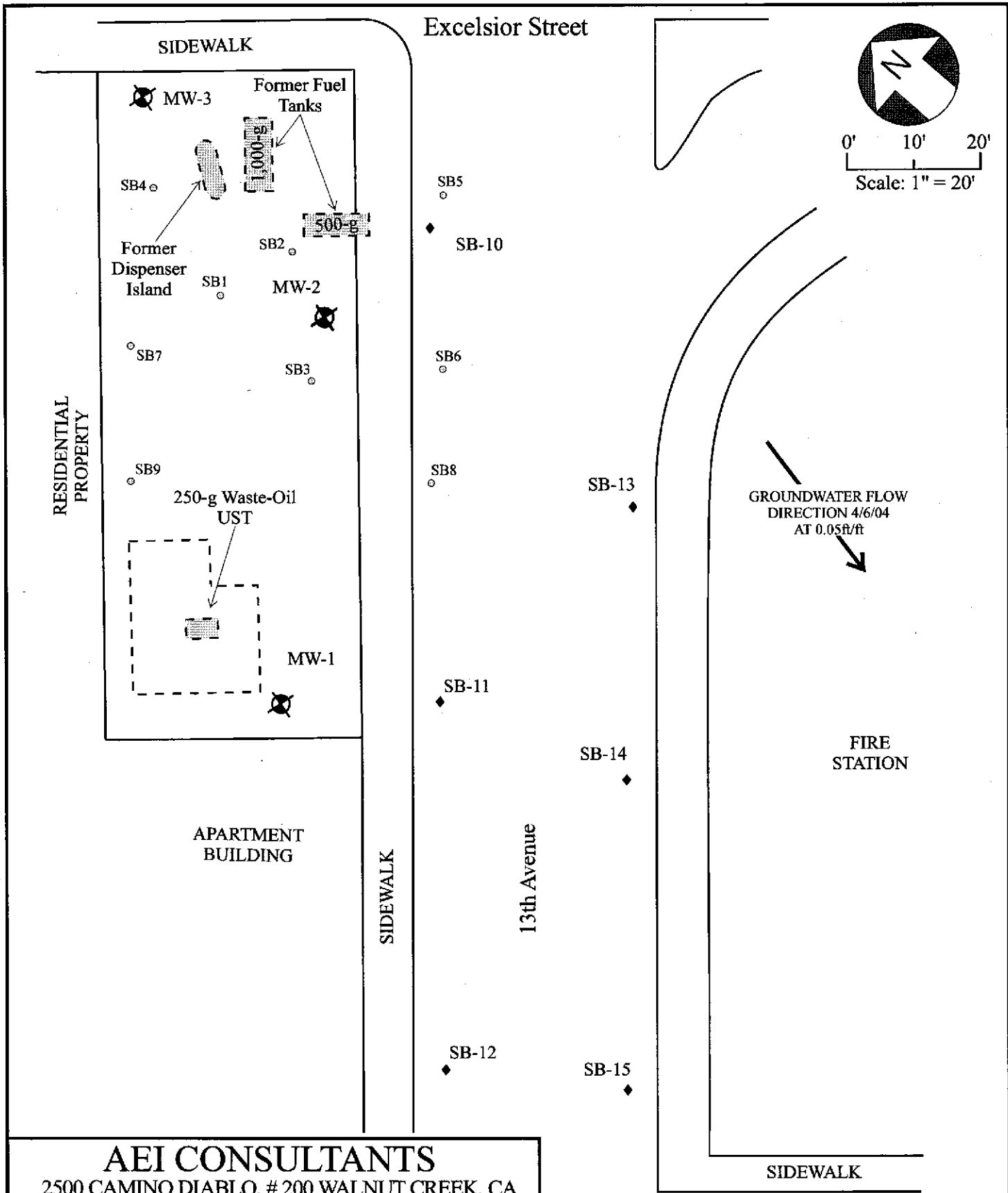
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**AEI CONSULTANTS**

**SITE LOCATION MAP**

3635 13<sup>th</sup> AVENUE  
OAKLAND, CALIFORNIA

**FIGURE 1**  
PROJECT NO. 6906



**AEI CONSULTANTS**  
 2500 CAMINO DIABLO, # 200 WALNUT CREEK, CA

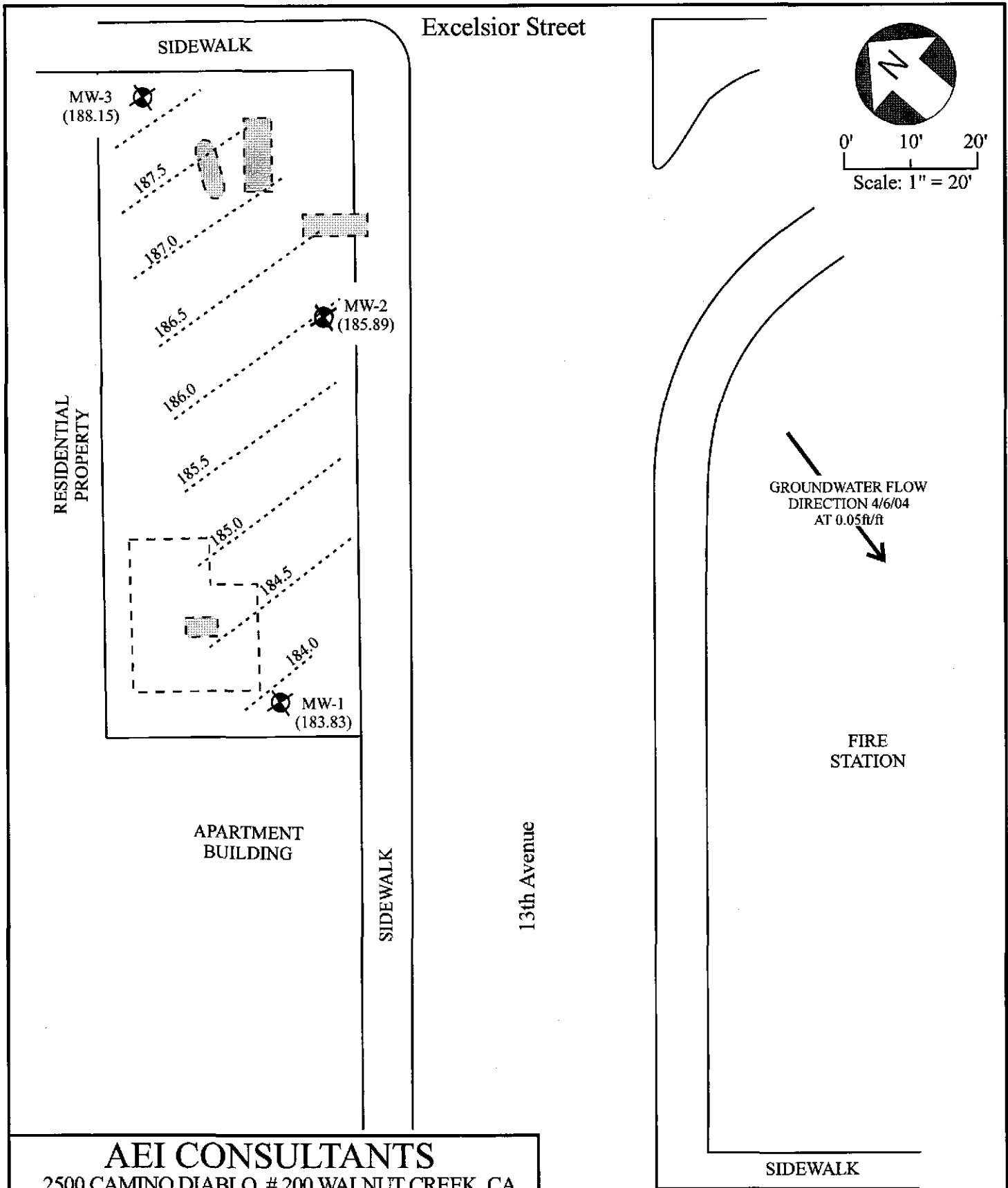
**SITE PLAN**

3635 13th Avenue  
 Oakland, California

**FIGURE 2**  
 AEI Project # 6906

LEGEND		(REV. 6/04)
◆	Monitoring Well	
○	Soil Boring 11/97 & 1/98	
◆	Soil Boring 8/21 & 10/9-10 2003	





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 2500 CAMINO DIABLO, # 200 WALNUT CREEK, CA

**WATER TABLE CONTOURS 4/6/04**

3635 13th Avenue  
 Oakland, California

**FIGURE 3**  
 AEI Project # 6906

LEGEND		(REV. 6/04)
	Monitoring Well, with water table elevation in ft above msl (4/6/04)	
	Water table contours in ft above msl Interval = 0.5 ft	

Excelsior Street

SIDEWALK

MW-3

TPH-g - <50  
TPH-d - <50  
MTBE - <0.5  
B - <0.5  
T - <0.5  
E - <0.5  
X - <0.5

1000-g

500-g

MW-2

TPH-g - 6,900  
TPH-d - 1,300  
MTBE - 87  
B - 1100  
T - 100  
E - 380  
X - 780

RESIDENTIAL  
PROPERTY

MW-1

TPH-g - <50  
TPH-d - <50  
MTBE - <0.5  
B - <0.5  
T - 1.7  
E - <0.5  
X - 1.7

APARTMENT  
BUILDING

SIDEWALK



0' 10' 20'  
Scale: 1" = 20'

GROUNDWATER FLOW  
DIRECTION 4/6/04  
AT 0.05ft/r

FIRE  
STATION

SIDEWALK

# AEI CONSULTANTS

2500 CAMINO DIABLO, # 200 WALNUT CREEK, CA

## GROUNDWATER SAMPLE ANALYTICAL DATA: 4/6/04

3635 13th Avenue  
Oakland, California

FIGURE 4  
AEI Project # 6906

### LEGEND

(REV. 6/04)

- ◆ Monitoring Well
- ◆ Soil Boring 8/21 & 10/9-10 2003  
All data in µg/l  
See Tables 1 & 2 for details

**Table 1**  
**Monitoring Well Sample Analytical Data**

Well ID	Date	Well Elevation	Depth to Water	Water Table Elevation	TPH-g	TPH-d	TOG	MTBE	Benzene	Toluene	E-benzene	Xylenes
					(µg/l) EPA 8015M	(µg/l)	(mg/l) EPA 5520	(µg/l)	(µg/l)	(µg/l)	(µg/l)	(µg/l)
MW - 1	11/22/1994	194.75	10.92	183.83	210	<50	<0.5	-	<0.5	<0.5	<0.5	2.3
	2/23/1995	194.75	10.58	184.17	140	<50	1.2	-	<0.5	<0.5	0.6	1.5
	5/24/1995	194.75	10.94	183.81	<50	<50	<0.5	-	<0.5	<0.5	<0.5	<0.5
	8/18/1995	194.75	14.52	180.23	2800	<50	<0.5	-	25	6.2	22	30
	2/7/1996	194.75	4.43	190.32	<50	<50	<0.5	-	<0.5	<0.5	<0.5	<0.5
	9/6/1996	194.75	13.60	181.15	<50	<50	<5.0	<5.0	<0.5	<0.5	<0.5	<0.5
	6/19/1997	194.75	13.07	181.68	630	400	<5.0	15	25	9.7	100	14
	1/24/2002	194.75	9.53	185.22	60	<50	-	<5.0	3.3	2.8	2.0	6.0
	7/15/2003	194.75	12.85	181.90	87	<50	-	<5.0	15	4.9	3.3	9.2
	10/10/2003	194.75	14.58	180.17	81	110	-	<5.0	<0.5	0.62	0.57	0.5
	4/6/2004	194.75	10.92	183.83	<50	<50	-	<5.0	<0.5	<0.5	<0.5	<0.5
MW - 2	11/22/1994	196.44	12.54	183.90	11000	<50	<0.5	-	35	21	7.2	50
	2/23/1995	196.44	12.35	184.09	4000	<50	1.6	-	<0.5	<0.5	2.5	5.7
	5/24/1995	196.44	12.11	184.33	8600	<50	<0.5	-	95	37	37	70
	8/18/1995	196.44	16.25	180.19	7200	<50	<0.5	-	43	21	21	71
	2/7/1996	196.44	9.34	187.10	11000	<50	0.6	-	17	9.3	9.3	25
	9/6/1996	196.44	15.22	181.22	15000	1900	<5.0	ND	4300	920	460	1600
	6/19/1997	196.44	13.33	183.11	26000	2900	<5.0	<200	5300	1500	910	3200
	1/24/2002	196.44	9.72	186.72	34000	5300	-	<200	3100	1100	1100	2900
	7/15/2003	196.44	12.42	184.02	18000	6600	-	<1000	2300	310	690	1600
	10/10/2003	196.44	13.79	182.65	19000	1800	-	<500	2700	460	850	1800
	4/6/2004	196.44	10.55	185.89	6900	1300	-	<200	1100	100	380	780
MW - 3	11/22/1994	198.93	11.53	187.40	200	<50	3	-	<0.5	<0.5	<0.5	2
	2/23/1995	198.93	11.89	187.04	1500	<50	0.9	-	6.6	6.4	4.2	13
	5/24/1995	198.93	12.71	186.22	710	<50	<0.5	-	2.5	3.2	3.1	16
	8/18/1995	198.93	16.14	182.79	310	<50	<0.5	-	3.1	2.1	2.2	11
	2/7/1996	198.93	6.22	192.71	400	<50	2.2	-	1.4	2.5	2.2	7
	9/6/1996	198.93	13.51	185.42	<50	<50	<5.0	<5.0	<0.5	<0.5	<0.5	<0.5
	6/19/1997	198.93	12.46	186.47	<50	<50	<5.0	<5.0	<0.5	<0.5	<0.5	<0.5
	1/24/2002	198.93	10.08	188.85	58	<50	-	<5.0	4	2.7	2.3	6.7
	7/15/2003	198.93	12.45	186.48	<50	<50	-	<5.0	<0.5	<0.5	<0.5	<0.5
	10/10/2003	198.93	14.00	184.93	350	75	-	<5.0	14	16	23	60
	4/6/2004	198.93	10.78	188.15	<50	<50	-	<5.0	<0.5	1.7	<0.5	1.7

Well Elevation in feet above mean sea level (msl)  
 Depth to water in feet below the tops of the well casings  
 Water Table Elevations in feet above msl  
 TPH-g - Total petroleum hydrocarbons (TPH) as gasoline

TOG - Total oil and grease  
 MTBE - Methyl tertiary butyl ether  
 E-benzene: Ethyl-benzene  
 TPH-d - TPH as diesel

mg/l - milligrams per liter  
 µg/l - micrograms per liter  
 - = sample not analyzed by this method  
 ND = non detect (detection limit not known)

**Table 2**  
**Fuel Oxygenate Analyses**

Well ID	Date	TAME (µg/l)	TBA (µg/l)	EDB (µg/l)	1,2-DCA (µg/l)	DIPE (µg/l)	Ethanol (µg/l)	ETBE (µg/l)	Methanol (µg/l)	MTBE (µg/l)
MW - 1	4/6/2004	<0.5	<5.0	<0.5	<0.5	<0.5	<50	<0.5	<500	<0.5
MW - 2	4/6/2004	<5.0	110	<5.0	<5.0	<5.0	<500	<5.0	<5000	87
MW -3	4/6/2004	<0.5	<5.0	<0.5	<0.5	<0.5	<50	<0.5	<500	<0.5

TAME: tert amyle methyl ether  
TBA: t-butyl alcohol  
EDB: 1,2-Dibromoethane  
1,2-DCA: 1,2-Dichloroethane  
DIPE: Diisopropyl ether

ETBE: Ethyl tert-butyl ether  
MTBE: Methyl tert-butyl ether  
µg/l - micrograms per liter  
- = sample not analyzed by this method  
ND = non detect

**AEI CONSULTANTS**  
**GROUNDWATER MONITORING WELL FIELD SAMPLING FORM**

**Monitoring Well Number: MW-1**

Project Name:	Williamson	Date of Sampling:	4/6/2004
Job Number:	6906	Name of Sampler:	A Nieto
Project Address:	3635 13th Avenue, Oakland		

**MONITORING WELL DATA**

Well Casing Diameter (2"/4"/6")	2		
Wellhead Condition	OK <input type="button" value="▼"/>		
Elevation of Top of Casing (feet above msl)	194.75		
Depth of Well	23.50		
Depth to Water (from top of casing)	10.92		
Water Elevation (feet above msl)	183.83		
Well Volumes Purged	3		
Calculated Gallons Purged: formula valid only for casing sizes of 2" (.16 gal/ft), 4" (.65 gal/ft), and 6" (1.44 gal/ft)	6.0		
Actual Volume Purged (gallons)	8.0		
Appearance of Purge Water	clears quickly		
Free Product Present?	no	Thickness (ft):	

**GROUNDWATER SAMPLES**

Number of Samples/Container Size				3 VOAs & 1-liter			
Time	Vol Removed (gal)	Temperature (deg C)	pH	Conductivity (µS/cm)	DO (mg/L)	ORP (meV)	Comments
	2	17.70	6.97	1517	-	-83.9	
	4	17.35	6.98	1487	-	-95.6	
	6	17.54	6.93	1495	-	-112.4	
	8	17.74	6.97	1523	-	-120.9	

**COMMENTS (i.e., sample odor, well recharge time & percent, etc.)**

Initially brown, no hydrocarbon sheen or odor

**AEI CONSULTANTS**  
**GROUNDWATER MONITORING WELL FIELD SAMPLING FORM**

**Monitoring Well Number: MW-2**

Project Name:	Williamson	Date of Sampling:	4/6/2004
Job Number:	6906	Name of Sampler:	A Nieto
Project Address:	3635 13th Avenue, Oakland		

**MONITORING WELL DATA**

Well Casing Diameter (2"/4"/6")	2		
Wellhead Condition	OK		
Elevation of Top of Casing (feet above msl)	196.44		
Depth of Well	36.00		
Depth to Water (from top of casing)	10.55		
Water Elevation (feet above msl)	185.89		
Well Volumes Purged	3		
Gallons Purged: formula valid only for casing sizes of 2" (.16 gal/ft), 4" (.65 gal/ft), and 6" (1.44 gal/ft)	12.2		
Actual Volume Purged (gallons)	15.0		
Appearance of Purge Water	clear by 3 gallons		
Free Product Present?	no	Thickness (ft):	

**GROUNDWATER SAMPLES**

Number of Samples/Container Size				3 VOAs & 1-liter			
Time	Vol Removed (gal)	Temperature (deg C)	pH	Conductivity (μS/cm)	DO (mg/L)	ORP (meV)	Comments
	3	20.10	6.90	1219	-	-229.8	
	6	19.68	6.85	1179	-	-230.8	
	9	19.93	6.80	1232	-	-228.5	
	12	20.25	6.75	1268	-	-229.9	
	15	20.41	6.87	1251	-	-259.1	

**COMMENTS (i.e., sample odor, well recharge time & percent, etc.)**

Initially grey, clears; moderate hydrocarbon odor

**AEI CONSULTANTS**  
GROUNDWATER MONITORING WELL FIELD SAMPLING FORM

**Monitoring Well Number: MW-3**

Project Name:	Williamson	Date of Sampling:	4/6/2004
Job Number:	6906	Name of Sampler:	A Nieto
Project Address:	3635 13th Avenue, Oakland		

**MONITORING WELL DATA**

Well Casing Diameter (2"/4"/6")	2		
Wellhead Condition	OK		
Elevation of Top of Casing (feet above msl)	198.93		
Depth of Well	35.50		
Depth to Water (from top of casing)	10.78		
Water Elevation (feet above msl)	188.15		
Well Volumes Purged	3		
Gallons Purged: formula valid only for casing sizes of 2" (.16 gal/ft), 4" (.65 gal/ft), and 6" (1.44 gal/ft)	11.9		
Actual Volume Purged (gallons)	15.0		
Appearance of Purge Water	clear at 2 gallons		
Free Product Present?	no	Thickness (ft):	

**GROUNDWATER SAMPLES**

Number of Samples/Container Size				3 VOAs & 1-liter			
Time	Vol Removed (gal)	Temperature (deg C)	pH	Conductivity (µS/cm)	DO (mg/L)	ORP (meV)	Comments
	3	19.37	7.71	747	-	-126.1	
	6	19.24	7.56	734	-	-136.9	
	9	19.61	7.55	765	-	-150.1	
	12	19.76	7.55	769	-	-145.7	
	15	19.83	7.56	753	-	-137.2	

**COMMENTS (i.e., sample odor, well recharge time & percent, etc.)**

Initially light brown, clears quickly; no hydrocarbon odor noted



**McC Campbell Analytical, Inc.**

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
Telephone : 925-798-1620 Fax : 925-798-1622  
Website: www.mccampbell.com E-mail: main@mccampbell.com

All Environmental, Inc. 2500 Camino Diablo, Ste. #200 Walnut Creek, CA 94597	Client Project ID: #8499;Williamson	Date Sampled: 04/06/04
		Date Received: 04/06/04
	Client Contact: Peter McIntyre	Date Reported: 04/12/04
	Client P.O.:	Date Completed: 06/29/04

**WorkOrder: 0404065**

June 29, 2004

Dear Peter:

Enclosed are:

- 1). the results of 3 analyzed samples from your #8499;Williamson project,
- 2). a QC report for the above samples
- 3). a copy of the chain of custody, and
- 4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits.

If you have any questions please contact me. McC Campbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Yours truly,

Angela Rydelius, Lab Manager





# McC Campbell Analytical, Inc.

110 2nd Avenue South, #D7, Pacheco, CA 94553-5560  
 Telephone : 925-798-1620 Fax : 925-798-1622  
 Website: www.mccampbell.com E-mail: main@mccampbell.com

All Environmental, Inc.  2500 Camino Diablo, Ste. #200  Walnut Creek, CA 94597	Client Project ID: #8499;Williamson	Date Sampled: 04/06/04
		Date Received: 04/06/04
	Client Contact: Peter McIntyre	Date Extracted: 04/07/04-04/09/04
	Client P.O.:	Date Analyzed: 04/07/04-04/09/04

## Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE\*

Extraction method: SW5030B

Analytical methods: SW8021B/8015Cm

Work Order: 0404065

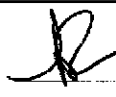
Lab ID	Client ID	Matrix	TPH(g)	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes	DF	% SS
001A	MW-1	W	ND	ND	ND	ND	ND	ND	1	96.9
002A	MW-2	W	6900,a,h	ND<200	1100	100	380	780	5	116
003A	MW-3	W	ND	ND	ND	1.7	ND	1.7	1	98.8

Reporting Limit for DF=1; ND means not detected at or above the reporting limit	W	50	5.0	0.5	0.5	0.5	0.5	1	µg/L
	S	NA	NA	NA	NA	NA	NA	1	mg/Kg

\* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

# cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McC Campbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern; n) TPH(g) range non-target isolated peaks subtracted out of the TPH(g) concentration at the client's request.

 Angela Rydelius, Lab Manager



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All Environmental, Inc.  2500 Camino Diablo, Ste. #200  Walnut Creek, CA 94597	Client Project ID: #8499;Williamson	Date Sampled: 04/06/04
		Date Received: 04/06/04
	Client Contact: Peter McIntyre	Date Extracted: 04/06/04
	Client P.O.:	Date Analyzed: 04/06/04-04/07/04

## Diesel Range (C10-C23) Extractable Hydrocarbons as Diesel\*

Extraction method: SW3510C

Analytical methods: SW8015C

Work Order: 0404065

Lab ID	Client ID	Matrix	TPH(d)	DF	% SS
0404065-001B	MW-1	W	ND	1	91.8
0404065-002B	MW-2	W	1300,d,h	2	89.8
0404065-003B	MW-3	W	ND	1	93.6


Reporting Limit for DF =1; ND means not detected at or above the reporting limit	W	50	µg/L
	S	NA	NA

\* water samples are reported in µg/L, wipe samples in µg/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all DISTLC / STLC / SPLP / TCLP extracts are reported in µg/L.

# cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McC Campbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant; d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel; f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; k) kerosene/kerosene range/jet fuel range; l) bunker oil; m) fuel oil; n) stoddard solvent/mineral spirit.

DHS Certification No. 1644

 Angela Rydelius, Lab Manager



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All Environmental, Inc. 2500 Camino Diablo, Ste. #200 Walnut Creek, CA 94597	Client Project ID: #8499;Williamson	Date Sampled: 04/06/04
		Date Received: 04/06/04
	Client Contact: Peter McIntyre	Date Extracted: 04/06/04
	Client P.O.:	Date Analyzed: 04/06/04

### Oxygenated Volatile Organics + EDB and 1,2-DCA by P&T and GC/MS\*

Extraction Method: SW5030B

Analytical Method: SW8260B

Work Order: 0404065

Lab ID	0404065-001C	0404065-002C	0404065-003C		Reporting Limit for DF =1
Client ID	MW-1	MW-2	MW-3		
Matrix	W	W	W		
DF	1	10	1		

Compound	Concentration			ug/kg	µg/L
	tert-Amyl methyl ether (TAME)	ND	ND<5.0	ND	NA
t-Butyl alcohol (TBA)	ND	110	ND	NA	5.0
1,2-Dibromoethane (EDB)	ND	ND<5.0	ND	NA	0.5
1,2-Dichloroethane (1,2-DCA)	ND	ND<5.0	ND	NA	0.5
Diisopropyl ether (DIPE)	ND	ND<5.0	ND	NA	0.5
Ethanol	ND	ND<500	ND	NA	50
Ethyl tert-butyl ether (ETBE)	ND	ND<5.0	ND	NA	0.5
Methanol	ND	ND<5000	ND	NA	500
Methyl-t-butyl ether (MTBE)	ND	87	ND	NA	0.5

### Surrogate Recoveries (%)

%SS:	103	95.5	105	
Comments		h		

\* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in µg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

ND means not detected above the reporting limit; N/A means analyte not applicable to this analysis.

# surrogate diluted out of range or surrogate coelutes with another peak.

h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) sample diluted due to high organic content.



**QC SUMMARY REPORT FOR SW8021B/8015Cm**

Matrix: W

WorkOrder: 0404065

EPA Method: SW8021B/8015Cm		Extraction: SW5030B		BatchID: 11008		Spiked Sample ID: 0404055-012A				
	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(btex) <sup>£</sup>	ND	60	108	107	0.206	101	99.6	1.81	70	130
MTBE	ND	10	91.4	91.6	0.211	105	111	5.96	70	130
Benzene	ND	10	111	112	0.963	112	119	6.03	70	130
Toluene	ND	10	106	108	1.69	106	117	9.71	70	130
Ethylbenzene	ND	10	115	115	0	110	115	4.91	70	130
Xylenes	ND	30	103	107	3.17	96	100	4.08	70	130
%SS:	97.1	10	105	105	0	105	106	0.867	70	130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS - MSD) / ((MS + MSD) / 2).

\* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

# cluttered chromatogram; sample peak coelutes with surrogate peak.

N/A = not applicable or not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

QA/QC Officer



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### QC SUMMARY REPORT FOR SW8015C

Matrix: W

WorkOrder: 0404065

EPA Method: SW8015C		Extraction: SW3510C			BatchID: 11001		Spiked Sample ID: N/A			
	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
TPH(d)	N/A	7500	N/A	N/A	N/A	91.8	94.4	2.80	70	130
%SS:	N/A	2500	N/A	N/A	N/A	98.5	101	2.50	70	130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.


% Recovery =  $100 * (MS - Sample) / (Amount Spiked)$ ; RPD =  $100 * (MS - MSD) / ((MS + MSD) / 2)$ .

\* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

DHS Certification No. 1644

 QA/QC Officer



QC SUMMARY REPORT FOR SW8260B

Matrix: W

WorkOrder: 0404065

EPA Method: SW8260B		Extraction: SW5030B		BatchID: 11009			Spiked Sample ID: 0404065-001C			
	Sample	Spiked	MS*	MSD*	MS-MSD*	LCS	LCSD	LCS-LCSD	Acceptance Criteria (%)	
	µg/L	µg/L	% Rec.	% Rec.	% RPD	% Rec.	% Rec.	% RPD	Low	High
tert-Amyl methyl ether (TAME)	ND	10	101	101	0	89.8	91.5	1.86	70	130
t-Butyl alcohol (TBA)	ND	50	75.3	75.5	0.216	75.8	76.3	0.607	70	130
1,2-Dibromoethane (EDB)	ND	10	102	104	2.17	92	93.8	1.99	70	130
1,2-Dichloroethane (1,2-DCA)	ND	10	114	114	0	104	105	0.712	70	130
Diisopropyl ether (DIPE)	ND	10	108	107	0.731	100	99.6	0.600	70	130
Ethanol	ND	500	112	118	4.75	116	98.7	15.9	70	130
Ethyl tert-butyl ether (ETBE)	ND	10	99	99	0	89.5	90.2	0.779	70	130
Methanol	ND	2500	97.7	98.3	0.635	97.2	96.8	0.420	70	130
Methyl-t-butyl ether (MTBE)	ND	10	98.6	100	1.46	87.8	89	1.32	70	130
%SS2:	100	10	91.8	91.9	0.148	92.4	93.4	1.02	70	130

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:  
NONE

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 \* (MS-Sample) / (Amount Spiked); RPD = 100 \* (MS - MSD) / ((MS + MSD) / 2).

\* MS and / or MSD spike recoveries may not be near 100% or the RPDs near 0% if: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) if that specific sample matrix interferes with spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

NR = analyte concentration in sample exceeds spike amount for soil matrix or exceeds 2x spike amount for water matrix or sample diluted due to high matrix or analyte content.

Laboratory extraction solvents such as methylene chloride and acetone may occasionally appear in the method blank at low levels.

0404065

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**CHAIN OF CUSTODY RECORD**

**TURN AROUND TIME**

RUSH  24 HR  48 HR  72 HR  5 DAY

EDF Required?  Yes  No

Report To: Peter McIntyre Bill To:  
Company: AEI Consultants  
2500 Camino Diablo, Suite 200  
Walnut Creek, CA 94597 E-Mail:  
Tele: (925) 944-2899 Fax: (925) 944-2895  
Project #: 8499 Project Name: Williamson  
Project Location: 3635 15<sup>th</sup> Ave, Oakland  
Sampler Signature: Adrian Nieu

Analysis Request										Other	Comments					
BTEX & TPH as Gas (602/8020 + 8015)/MTBE	TPH as Diesel (8015)	Total Petroleum Oil & Grease (5520 E&F/B&F)	Total Petroleum Hydrocarbons (418.1)	EPA 601 / 8010	BTEX ONLY (EPA 602 / 8020)	EPA 608 / 8080	EPA 608 / 8080 PCB's ONLY	EPA 624 / 8240 / 8260	EPA 625 / 8270	PAH's / PNA's by EPA 625 / 8270 / 8310	CAM-17 Metals	LUFT 5 Metals	Lead (7240/7421/239.2/601.0)	RCI	TAME, STBE, DIPE, TBA, Ethanol/ MTBE, EOB, and 1-2 DCA	826015

SAMPLE ID (Field Point Name)	LOCATION	SAMPLING		# Containers	Type Containers	MATRIX					METHOD PRESERVED					
		Date	Time			Water	Soil	Air	Sludge	Other	Ice	HCl	HNO <sub>3</sub>	Other		
MW-1		4/1/04	am	4	1/veg R						X	X				
MW-2		↓	↓	4	↓	X					X	X				
MW-3		↓	↓	4	↓	X					X	X				

Relinquished By: Adrian Nieu Date: 4/1/04 Time: 4:05 Received By: [Signature]  
Relinquished By: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received By: \_\_\_\_\_  
Relinquished By: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received By: \_\_\_\_\_

ICE/° \_\_\_\_\_ PRESERVATION  VOAS  O&G  METALS  OTHER   
GOOD CONDITION  APPROPRIATE  
HEAD SPACE ABSENT \_\_\_\_\_ CONTAINERS   
DECLORINATED IN LAB \_\_\_\_\_ PERSERVED IN LAB \_\_\_\_\_