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March 5, 2007

Mr. Barney Chan  
Alameda County Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502

**Subject: Free Product Recovery System WorkPlan**  
1075 40<sup>th</sup> Street  
Oakland, California  
ACEH Fuel Leak Case RO0000186  
AEI Project No. 116303

Dear Mr. Chan:

As requested, enclosed is an electronic copy of the recently completed Free Product Recovery System Workplan for installation of a Keck PRC-91 passive free product skimmer system. Depending upon equipment availability, this system can be installed within one (1) week of workplan approval.

Should have any questions or comments, you may reach me at (925) 283-6000, ext. 148.

Sincerely,  
**AEI Consultants**

Richard J. Bradford  
Senior Staff Engineer

RB/

Enclosure

March 5, 2007

**FREE PRODUCT RECOVERY  
SYSTEM WORKPLAN**

1075 40<sup>th</sup> Street  
Oakland, California

AEI Project No. 116303  
ACEH Case No. RO0000186

Prepared For

Mr. Monte Upshaw  
Fidelity Roof Company  
1075 40<sup>th</sup> Street  
Oakland, CA 94608

Prepared By

**AEI Consultants**  
2500 Camino Diablo, Suite 200  
Walnut Creek, CA 94597  
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**AEI**

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## 1.0 INTRODUCTION

AEI Consultants (AEI) has prepared this work plan for installation of a passive free product recovery system on behalf of Fidelity Roof Company (FRC), which is located at 1075 40<sup>th</sup> Street in the City of Oakland, Alameda County, California (Figure 1). AEI has been retained by FRC to provide environmental engineering and consulting services related to the release of petroleum hydrocarbons from the former underground storage tank (UST) and dispensing system on the property. The ongoing investigation and remediation of the release is being performed under the direction of Alameda County Environmental Health (ACEH).

## 2.0 SITE DESCRIPTION AND HISTORY

The site currently supports the operation of Fidelity Roof Company and is located in a mixed residential and commercial area of Oakland at 1075 40th Street.

On December 19, 1995, Tank Protect Engineering, Inc. removed one (1) 1,000-gallon diesel UST and one (1) 500-gallon gasoline UST from the southeast corner of the property. The removal of the tanks produced a single excavation. Analysis of the soil samples indicated that soil beneath the 1,000-gallon UST had been impacted by minor concentrations of total petroleum hydrocarbons as gasoline (TPH-g), TPH as diesel (TPH-d), benzene, toluene, ethylbenzene, and total xylenes (BTEX), and methyl tertiary-butyl ether (MTBE).

On September 12, 1996, AEI advanced four (4) soil borings near the former UST excavation. Analytical results from the subsurface investigation revealed significant levels of gasoline and diesel petroleum hydrocarbons present in soil and groundwater to the south and to the west of the open excavation. Due to the high concentrations of petroleum hydrocarbons within the groundwater, the ACHCSA required further investigation of the extent and magnitude of the groundwater contaminant plume.

On October 25, 1996, AEI extended the excavation laterally 7 feet to the south and 12 feet to the west. Soil was removed to a depth of 9 feet below ground surface (bgs). The dispenser island and associated piping were also removed. Analyses of the soil samples collected from the excavation sidewalls indicated that up to 150 milligrams per kilogram (mg/kg) of TPH-g, 16 mg/kg of benzene, and 300 mg/kg of TPH-d remained within the western sidewall of the excavation.

On March 6, 1997, AEI installed three (3) groundwater monitoring wells, MW-1 through MW-3. TPH-g and TPH-d were detected in well MW-3 at concentrations of 26,000 micrograms per liter ( $\mu\text{g/L}$ ) and 5,000  $\mu\text{g/L}$ , respectively. No TPH-g or TPH-d was detected in wells MW-1 and MW-2, at the time of the initial sampling. MTBE was detected in wells MW-1, MW-2 and MW-3 at concentrations of 23  $\mu\text{g/L}$ , 65  $\mu\text{g/L}$  and 230  $\mu\text{g/L}$ , respectively. Well construction details for the groundwater monitoring wells are summarized in Table 1.

At the request of the ACHCSA, six (6) additional soil borings were drilled south and west of the well locations on November 4, 1998. TPH-d was detected at a concentration of 2,400 µg/L in groundwater to the south of the former excavation. No significant concentrations of petroleum hydrocarbons were detected from the other borings.

Monitoring well MW-4 was installed on July 15, 1999, located south of the former tank locations along Yerba Buena Avenue. No hydrocarbons were detected in MW-4 at the time of installation; however, MTBE was reported at a concentration of 37 µg/L. The results of on going groundwater monitoring of these four wells is summarized on Tables 2, 2a, and 3.

On May 6, 2004, AEI installed one (1) vapor extraction well (VE-1) and two (2) air sparge wells (AS-1 and AS-1). Six (6) shallow drive point (DP) micro-wells (DP-1 through DP-6) were installed on May 13, 2004 using direct push technology. On May 19 through 20, 2004, AEI carried out a soil vapor extraction and air sparge pilot test. The results of this pilot test and recommendations for remediation are summarized in AEI's *Soil Vapor Extraction and Air Sparge Pilot Test Report*, dated August 6, 2004.

A 5-day HVDPE event was conducted at the site between the dates of March 8 through 13, 2006. Total influent hydrocarbon concentrations, as measured by the Horiba OVA ranged from approximately 156 part per million by volume (ppmv) to 355 ppmv. The total system flow rate ranged from 32 to 50 scfm. Hydrocarbon concentrations stabilized in the 450 to 500 ppmv range until the end of the day on March 12, 2006 when the concentrations fell to about 340 ppmv. By the last day of the event, concentrations stabilized in the 150 to 200 ppmv range. Based on CalClean mass removal calculations using the Horiba OVA data, a total of approximately 58.4 pounds of hydrocarbons were recovered.

Two additional groundwater monitoring wells (MW-5 and MW-6) were installed on December 14, 2006 to define the horizontal extent of MTBE groundwater plume. Details on the results of the well installation and sampling are summarized in AEI's *"Monitoring Well Installation & Groundwater Monitoring Report"*, dated January 30, 2007.

### **3.0 GEOLOGY AND HYDROGEOLOGY**

The site lies on the distal end of the Temescal Alluvial Fan at approximately 45 feet above mean seal level (msl). The Temescal Alluvial Fan is a low relief broad fan sloping westward from the mouth of the Temescal Creek. The Holocene age alluvial fan deposits are mapped as Qhaf (Helley 1997). The sediments are described as typically, brown to tan gravelly sand or sandy gravel, which generally grades upward into sandy or silty clay.

In general, the sediments in the upper 21 feet of the site are poorly sorted, consisting typically of yellowish brown clayey sandy gravels, silts and clay. Where reduced due to the presence of hydrocarbons the sediments grade from olive to gray to black.

Tables 2 and 3 show historical and current depth to water measurements, average water table elevation, and the groundwater gradient and flow direction. The direction of groundwater flow is constantly to the northwest with a calculated hydraulic gradient in the range of 0.015 to 0.09 foot per foot. Historically, the groundwater elevation at the site has ranged from 32.77 to 37.95 feet amsl (MW-2). In well MW-2, the annual fluctuation in groundwater elevation has ranged from 2.47 to 4.52 feet with an average of 3.47 feet. The smear zone is about 5 to 6 feet thick and a considerable mass of adsorbed phase hydrocarbons exist in the clayey soils from approximately 5.5 to 12 feet bgs.

#### 4.0 LNAPL REMOVAL

Light non-aqueous phase liquid (LNAPL) was reported by the laboratory in samples from monitoring well MW-3 collected on November 18, 1999, but was not present in a measurable thickness until 2004.

On September 9, 2004, 0.66 feet of LNAPL was measured in MW-3. On September 23, 2004, 200 gallons of liquid (water and gasoline) were removed from monitoring well MW-3 by Excel Environmental Services. The liquid was removed by placing a 1-inch diameter PVC stinger into the well and dewatering the well to 17 feet bgs for approximately 90 minutes using a vacuum truck. On September 29, 2004, 0.52 feet of LNAPL was measured in MW-3.

On October 22, 2004, 30 gallons of liquids were removed from MW-3 by extending the 1-inch PVC stinger into the top of the static water table approximately 6-inches and vacuuming for approximately 1 hour. On October 27, 2004, 0.32 feet of LNAPL was measured in well MW-3.

On November 4 and 23, 2004, 15 gallons of liquid was removed on each visit by vacuuming the surface of the groundwater.

LNAPL measurements on November 6 and 19, 2004 were 0.01 feet and 0.14 feet, respectively. The total amount of LNAPL removed is difficult to quantify. Free product removal was discontinued when the thickness stabilized at less than 0.05 feet.

Apparent LNAPL thickness stabilized to less than 0.05 feet through the March 11, 2005 sampling event and increased to 0.12 feet and 0.64 feet by June and September 2005, respectively.

A 5-day HVDPE event was conducted at the site between the dates of March 8 through 13, 2006. This extraction event was successful in reducing the apparent LNAPL thickness from 0.95 feet to less than sheen. During the extraction event, a total volume of approximately 3,750 gallons of hydrocarbon impacted groundwater was recovered and treated. Please refer to AEI's "*High Vacuum Dual Phase Extraction Interim Corrective Action Report*", dated June 20, 2006, for more information on this event.

However, during the September 18, 2006 monitoring event, 0.04 feet of LNAPL was present. By January 3, 2007, 0.68 feet was measured in MW-3. This suggests that a mass of free phase



hydrocarbons remain in the vicinity of MW-3, although the volume is expected to be small and isolated to this area based on the lower dissolved phase hydrocarbon concentrations in the surrounding wells.

## **5.0 PASSIVE FREE PRODUCT RECOVERY SYSTEM**

AEI will install a passive free product recovery system in MW-3 that will operate in conjunction with the bioventing and biosparging system. The free product recovery system will consist of one (1) Liter canister and float rig suspended inside the well and secured to the wellhead. The equipment is designed to collect LNAPL down to a sheen without taking in water.

### **5.1 Equipment Details**

The equipment is a Keck model PRC-91 passive skimmer device and free product recovery system designed to separate and recover LNAPL from groundwater. The Keck system consists of a hydrophobic/oleophilic float attached to a one (1) Liter (0.26 gallon) transparent canister. The system is available for 2-inch diameter or larger diameter wells and can travel up to 12-inches to compensate for seasonal and other water table fluctuations. The 1-Liter model is 82.5-inches long by 1.75-inches O.D. and constructed of stainless steel, brass, and engineered thermoplastics. It weighs 5.2 lbs empty and approximately 6.7 lbs full. With the addition of an air compressor, air supply and NAPL discharge lines; the Keck PRC-91 can be converted to an active skimmer system. See Appendix A for a detailed specification sheet.

### **5.2 Installation**

Installation and setup of the recovery system is expected to take approximately three (3) to four (4) hours. Prior to mobilizing to the site, AEI's project engineer will review the installation procedures with AEI's senior field technician. AEI's senior field tech will then mobilize to the site for the installation. The depth to NAPL and water will be measured with an electronic oil-water interface meter and a sample of the free product will be collected using a disposable plastic bailer and transferred into a one (1) 1-Liter amber bottle for possible analyses. The Keck PRC-91 system will then be lowered down into MW-3 and secured at the wellhead. A drum for storage of recovered free product will be sealed, labeled appropriately, and secured in an onsite location shown on Figure 2.

### **5.3 Operations & Maintenance**

Approximately one (1) week following installation an AEI technician will mobilize to the site for the first maintenance visit. The well cap will be removed and the PRC-91 system and canister will then be raised to the surface. The product is removed through a discharge valve located at the bottom of the canister. The discharge valve will be opened and the canister emptied into the 55 gallon storage drum. The skimmer system will then be returned to MW-3. An AEI technician will monitor the progress of LNAPL removal and estimate recovery rates. An AEI technician will stop by the site once a week or as needed to empty the free product from the canister.

## **6.0 VACUUM-ENHANCED FREE PRODUCT RECOVERY**

AEI selected an initial phase of “passive” free product recovery since it can be implemented quickly and cost-effectively. In addition to this, AEI proposes to explore the use of small-scale vacuum-enhanced free product recovery in MW-3. This active method of free product recovery can be more effective than passive removal and can be powered by the vacuum side of the bioventing blower. During the upcoming trenching and piping installation activities for the bioventing and biosparging system, AEI proposes to install one (1) 2 – 3-inch diameter rigid PVC conduit from MW-3 to the equipment location. A 1/2-inch nylon tubing or 1-inch PVC suction hose can be pulled thru the conduit for a future vacuum-enhanced free product recovery system. The cost for the electrical conduit is estimated at less than \$100.00. The conduit location is shown on Figure 2.

A conceptual design for a vacuum-enhanced free product recovery system will consist of conveyance tubing or hose, drop tube, wellhead connection, a 55-gallon steel drum for collection of NAPL, and tank full sensor or shut-off valve. The drop tube will be positioned at a point just above the NAPL-water interface that will optimize free product removal while minimizing groundwater recovery. Operation of this small-scale system will focus on both traditional skimming and using vacuum to move LNAPL horizontally into the well for removal. Free product can be stored in 55 gallon steel drums and disposed as needed in accordance with applicable federal, state, and local laws and regulations.

## **7.0 REFERENCES**

Suthersan, Suthan, “Remediation Engineering Design Concepts.” Chapter 6: Vacuum-Enhanced Recovery, CRC Press 1997, pp. 27 – 90.



## 8.0 CLOSING STATEMENT AND SIGNATURES

This workplan has been prepared by AEI on behalf of Fidelity Roof Company and outlines a scope of work to address the release of petroleum hydrocarbons from the former underground storage tank (UST) system previously removed from the property located at 1075 40<sup>th</sup> Street, Oakland, Alameda County, California. The recommendations rendered in this workplan were based on previous field investigations and laboratory testing of soil and groundwater samples. This report does not reflect subsurface variations that may exist between sampling points. These variations cannot be anticipated, nor could they be entirely accounted for, in spite of exhaustive additional testing. This plan should not be regarded as a guarantee that no further contamination, beyond that which could have been detected within the scope of this investigation is present beneath the said property or that all contamination present at the site will be treated or removed. Undocumented, unauthorized releases of hazardous material, the remains of which are not readily identifiable by visual inspection and are of different chemical constituents, are difficult and often impossible to detect within the scope of a chemical specific investigation that may or may not become apparent at a later time. All specified work would be performed in accordance with generally accepted practices in geotechnical and environmental engineering, engineering geology, and hydrogeology fields and will be performed under the direction of appropriate registered professional(s).

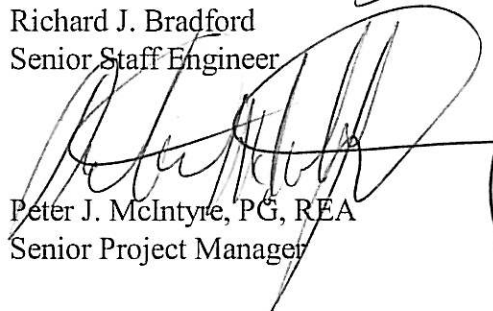
We look forward to hearing your comments regarding the proposed scope of work outlined herein. Should you have any questions or need any additional information, please contact either of the undersigned at (925) 283-6000.

Sincerely,

**AEI Consultants**



Richard J. Bradford  
Senior Staff Engineer



Peter J. McIntyre, PG, REA  
Senior Project Manager



### Distribution List

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Fidelity Roof Company  
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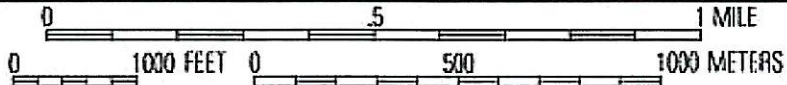
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## FIGURES



TN  $\star$  MN  
15°



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## AEI CONSULTANTS

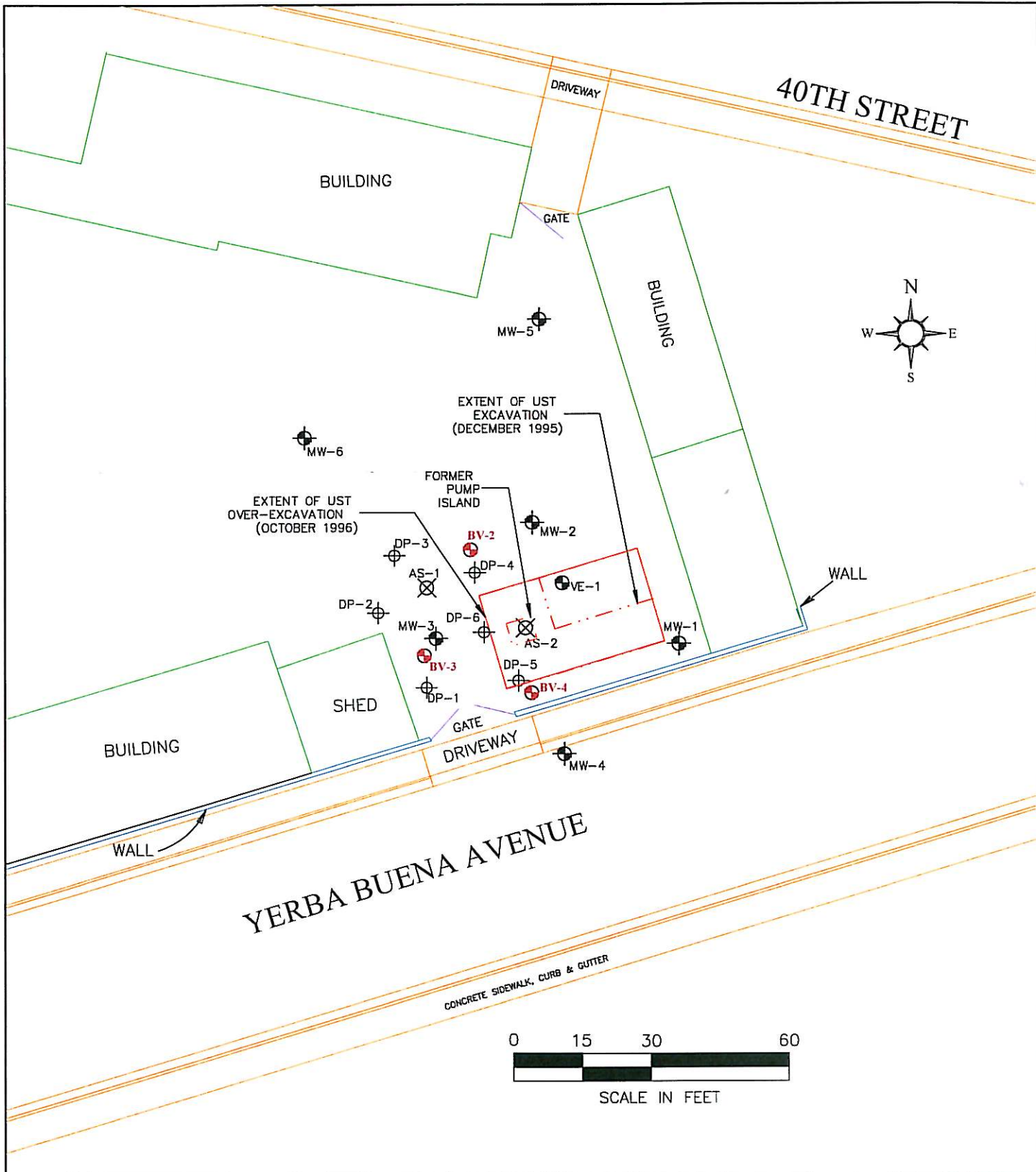
2500 CAMINO DIABLO, SUITE 200, WALNUT CREEK, CA 94597

### SITE LOCATION MAP






1075 40<sup>th</sup> STREET  
OAKLAND, CALIFORNIA

FIGURE 1  
AEI PROJECT NO. 116303





**LEGEND**

-  MONITORING WELL (20 - 21 FT BGS)
-  DRIVE POINT / MICRO WELL (15 FT BGS)
-  AIR SPARGE WELL (35 FT BGS)
-  VAPOR EXTRACTION WELL (10 FT BGS)
-  PROPOSED BIOVENTING WELL (15 FT BGS)

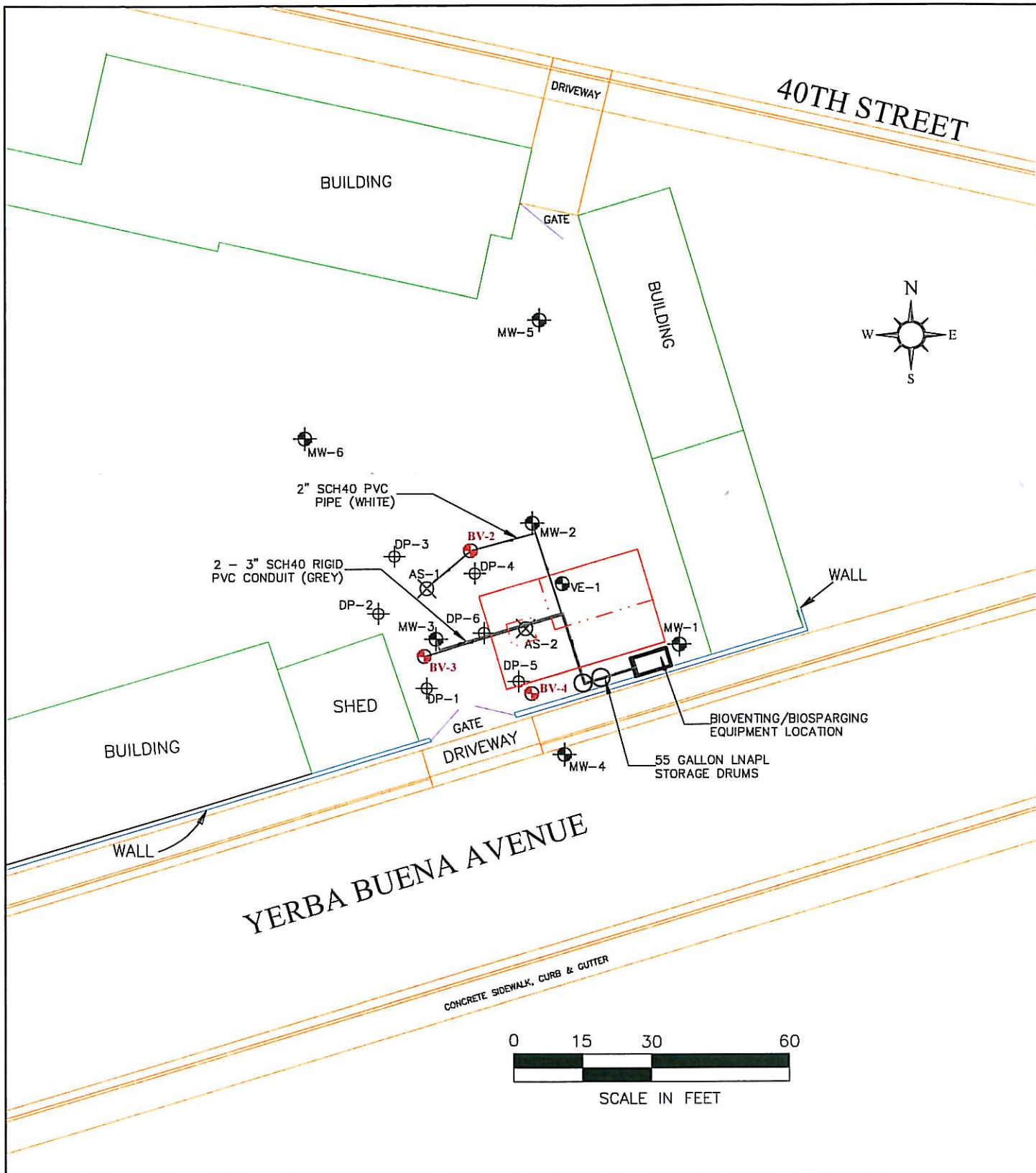
**AEI CONSULTANTS**

2500 CAMINO DIABLO, SUITE 200, WALNUT CREEK



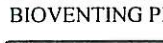
**SITE PLAN**

1075 40TH STREET  
OAKLAND, CALIFORNIA

**FIGURE 2**  
PROJECT NO. 116303



**LEGEND**

-  MONITORING WELL (20 - 21 FT BGS)
-  DRIVE POINT / MICRO WELL (15 FT BGS)
-  AIR SPARGE WELL (35 FT BGS)
-  VAPOR EXTRACTION WELL (10 FT BGS)
-  PROPOSED BIOVENTING WELL (15 FT BGS)
-  2" SCH 40 PVC BIOVENTING PIPING
-  2" SCH 40 PVC RIGID CONDUIT

<p><b>AEI CONSULTANTS</b> 2500 CAMINO DIABLO, SUITE 200, WALNUT CREEK</p>	
<p>TRENCHING &amp; PIPING PLANS (DRAFT)</p>	
<p>1075 40TH STREET OAKLAND, CALIFORNIA</p>	<p><b>FIGURE 3</b> PROJECT NO. 116303</p>

## TABLES

**TABLE 1: WELL CONSTRUCTION DETAILS**  
**Fidelity Roof Company, 1075 40th Street, Oakland, California**

Well ID	Date Drilled	Well Box Rim (ft)	Casing Elevation (ft msl)	Boring Depth (ft)	Slotted Interval (ft)	Slot Size (in)	Blank Casing (ft)	Sand Interval (ft)	Sand Size (ft)	Bentonite Interval (ft)	Grout Interval (ft)
MW-1	03/06/97	51.33	50.99	21.0	6-21	0.020	0.5-6	5-21	#3	4-5	0.5-4
MW-2	03/19/97	51.15	50.49	21.0	6-21	0.020	0.5-6	5-21	#3	4-5	0.5-4
MW-3	03/19/97	50.48	49.93	21.0	6-21	0.020	0.5-6	5-21	#3	4-5	0.5-4
MW-4	08/05/99	49.23	48.97	21.0	6-21	0.020	0.5-6	4-20	#3	3-4	0.5-3
MW-5	12/14/06	51.32	51.04	20.0	5.0-20.0	0.010	0.5-5.0	4-20	#2/12	3-4	0.5-3
MW-6	12/14/06	50.74	50.34	20.5	5.0-20.0	0.010	0.5-5.0	4-20.5	#2/12	3-4	0.5-3
AS-1	05/06/04	50.62	50.35	30.0	25-30	0.010	0.75-25	22-30	#2/12	19-22	1.0-19
AS-2	05/06/04	50.99	50.51	30.0	25-30	0.010	0.75-25	22-30	#2/12	19-22	1.0-19
VE-1	05/06/04	51.12	50.75	10.0	5-10	0.010	0.75-10	4-10	#2/12	3-4	1.0-3
DP-1	05/13/04	50.11	49.96	16.0	5.5-15.5	# 40 mesh	5.5-0.5	4.5-15.5	#30	3.5-4.5	0.75-3.5
DP-2	05/13/04	50.54	50.17	16.0	5.5-15.5	# 40 mesh	5.5-0.5	4.5-15.5	#30	3.5-4.5	0.75-3.5
DP-3	05/13/04	50.71	50.45	16.0	5.5-15.5	# 40 mesh	5.5-0.5	4.5-15.5	#30	3.5-4.5	0.75-3.5
DP-4	05/13/04	50.91	50.85	16.0	5.5-15.5	# 40 mesh	5.5-0.5	4.5-15.5	#30	3.5-4.5	0.75-3.5
DP-5	05/13/04	50.69	50.61	16.0	5.5-15.5	# 40 mesh	5.5-0.5	4.5-15.5	#30	3.5-4.5	0.75-3.5
DP-6	05/13/04	50.77	50.68	16.0	5.5-15.5	# 40 mesh	5.5-0.5	4.5-15.5	#30	3.5-4.5	0.75-3.5



**TABLE 2: GROUNDWATER ELEVATION DATA**  
**Fidelity Roofing, 1075 40th Street, Oakland, California**

Well ID	Date	Well Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
MW-1	03/19/97	45.41	8.25	37.16
	06/20/97	45.41	9.10	36.31
	10/08/97	45.41	9.95	35.46
	01/16/98	45.41	7.57	37.84
	08/05/99	45.49	10.16	35.33
	11/18/99	45.49	8.52	36.97
	02/24/00	45.49	7.65	37.84
	05/24/00	45.49	8.47	37.02
	08/29/00	45.49	10.28	35.21
	01/12/01	45.49	8.50	36.99
	04/18/01	45.49	8.77	36.72
	07/27/01	45.49	10.50	34.99
	11/06/01	45.49	10.28	35.21
	02/13/02	45.49	8.47	37.02
	05/14/02	45.49	9.50	35.99
	08/15/02	45.49	10.39	35.10
	11/14/02	45.49	9.08	36.41
	02/12/03	45.49	8.36	37.13
	05/16/03	45.49	8.49	37.00
	08/29/03	45.49	9.91	35.58
	12/02/03	45.49	8.88	36.61
	03/08/04	45.49	7.66	37.83
	06/08/04	45.49	9.39	36.10
	09/10/04	45.49	9.95	35.54
	12/13/04	45.49	6.94	38.55
	03/11/05	45.49	7.35	38.14
	06/15/05	45.49	8.29	37.20
	09/08/05	45.49	9.57	35.92
	12/01/05	45.49	7.66	37.83
	03/07/06	45.49	7.32	38.17
06/05/06	45.49	8.46	37.03	
09/18/06	45.49	9.36	36.13	
	<b>01/03/07**</b>	<b>50.99</b>	<b>7.99</b>	<b>43.00</b>
MW-2	03/19/97	44.94	8.40	36.54
	06/20/97	44.94	8.85	36.09
	10/08/97	44.94	9.80	35.14
	01/16/98	44.94	5.28	39.66
	08/05/99	44.98	9.32	35.66
	11/18/99	44.98	10.20	34.78
	02/24/00	44.98	7.03	37.95
	05/24/00	44.98	8.01	36.97
	08/29/00	44.98	11.07	33.91
	01/12/01	44.98	8.60	36.38
	04/18/01	44.98	8.80	36.18
	07/27/01	44.98	11.10	33.88
	11/06/01	44.98	12.21	32.77
02/13/02	44.98	7.98	37.00	

**TABLE 2: GROUNDWATER ELEVATION DATA**  
**Fidelity Roofing, 1075 40th Street, Oakland, California**

Well ID	Date	Well Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
MW-2 continued	05/14/02	44.98	10.48	34.50
	08/15/02	44.98	10.64	34.34
	11/14/02	44.98	11.69	33.29
	02/12/03	44.98	9.07	35.91
	05/16/03	44.98	11.25	33.73
	08/29/03	44.98	12.19	32.79
	12/02/03	44.98	10.92	34.06
	03/08/04	44.98	8.41	36.57
	06/08/04	44.98	10.19	34.79
	09/10/04	44.98	10.84	34.14
	12/13/04	44.98	9.26	35.72
	03/11/05	44.98	7.81	37.17
	06/15/05	44.98	10.80	34.18
	09/08/05	44.98	11.58	33.40
	12/01/05	44.98	9.03	35.95
	03/07/06	44.98	7.78	37.20
	06/05/06	44.98	9.28	35.70
	09/18/06	44.98	10.39	34.59
	<b>01/03/07**</b>	<b>50.49</b>	<b>8.79</b>	<b>41.70</b>
MW-3	03/19/97	44.32	7.59	36.73
	10/08/97	44.32	9.98	34.34
	06/20/97	44.32	8.36	35.96
	01/16/98	44.32	9.18	35.14
	08/05/99	44.37	10.56	33.81
	11/18/99	44.37	10.92	33.45
	02/24/00	44.37	8.49	35.88
	05/24/00	44.37	8.42	35.95
	08/29/00	44.37	12.00	32.37
	01/12/01	44.37	10.50	33.87
	04/18/01	44.37	9.50	35.22
	07/27/01	44.37	11.61	32.76
	11/06/01	44.37	11.73	32.64
	02/13/02	44.37	9.36	35.01
	05/14/02	44.37	9.00	35.37
	08/15/02	44.37	11.72	32.65
	11/14/02	44.37	11.28	33.09
	02/12/03	44.37	10.17	34.20
	05/16/03	44.37	11.47	32.90
	08/29/03	44.37	11.92	32.45
	12/02/04	44.37	10.96	33.41
	03/08/04	44.37	10.49	33.88
	06/08/04	44.37	9.89	34.48
	09/10/04	44.37	11.54	32.83
	12/13/04	44.37	8.96	35.41
03/11/05	44.37	6.99	37.38	
06/15/05	44.37	7.72	36.65	
09/8/05 *	44.37	10.61	33.76	

**TABLE 2: GROUNDWATER ELEVATION DATA**  
**Fidelity Roofing, 1075 40th Street, Oakland, California**

Well ID	Date	Well Elevation (ft msl)	Depth to Water (ft)	Groundwater Elevation (ft msl)
MW-3 continued	12/01/05*	44.37	ng	-
	03/7/06*	44.37	5.26	39.11
	06/5/06*	44.37	8.09	36.28
	09/18/06*	44.37	10.56	33.81
	<b>01/03/07**</b>	<b>49.93</b>	<b>8.84</b>	<b>41.09</b>
MW-4	08/05/99	43.48	8.79	34.69
	11/18/99	43.48	8.11	35.37
	02/24/00	43.48	5.19	38.29
	05/24/00	43.48	7.23	36.25
	08/29/00	43.48	9.04	34.44
	01/12/01	43.48	6.40	37.08
	04/18/01	43.48	7.30	36.18
	07/27/01	43.48	9.16	34.32
	11/06/01	43.48	9.03	34.45
	02/13/02	43.48	6.60	36.88
	05/14/02	43.48	7.19	36.29
	08/15/02	43.48	8.97	34.51
	11/14/02	43.48	7.52	35.96
	02/12/03	43.48	6.37	37.11
	05/16/03	43.48	6.81	36.67
	08/29/03	43.48	8.56	34.92
	12/02/03	43.48	6.02	37.46
	03/08/04	43.48	5.75	37.73
	06/08/04	43.48	8.19	35.29
	09/10/04	43.48	8.84	34.64
	12/13/04	43.48	5.51	37.97
	03/11/05	43.48	5.26	38.22
	06/15/05	43.48	6.79	36.69
	09/08/05	43.48	8.20	35.28
	12/01/05	43.48	6.93	36.55
03/07/06	43.48	4.17	39.31	
06/05/06	43.48	6.88	36.60	
09/18/06	43.48	8.33	35.15	
<b>01/03/07**</b>	<b>48.97</b>	<b>6.57</b>	<b>42.40</b>	
MW-5	<b>01/03/07**</b>	<b>51.04</b>	<b>16.47</b>	<b>34.57</b>
	<b>01/09/07</b>	<b>51.04</b>	<b>16.66</b>	<b>34.38</b>
MW-6	<b>01/03/07**</b>	<b>50.34</b>	<b>8.93</b>	<b>41.41</b>

**Notes:**

ft msl = feet above mean sea level

ng = not gauged

\* = apparent groundwater elevation, free product present

\*\* = well casing elevation resurvey completed 1/22/07

**TABLE 3: GROUNDWATER FLOW SUMMARY**  
**Fidelity Roofing, 1075 40th Street, Oakland, California**

Episode	Date	Average Water Table Elevation (ft msl)	Change in Water Table Elevation (ft)	Flow Direction (Gradient - ft/ft)
1	03/19/97	36.81	----	----
2	06/20/97	35.58	-1.23	----
3	10/08/97	35.52	-0.06	----
4	01/16/98	37.55	2.03	----
5	08/05/99	34.87	-2.67	----
6	11/18/99	35.14	0.27	----
7	02/24/00	37.49	2.35	----
8	05/24/00	36.55	-0.94	----
9	08/29/00	33.98	-2.57	NW (0.09)
10	01/12/01	36.08	2.10	W (0.06)
11	04/18/01	36.08	0.00	W (0.02)
12	07/27/01	33.99	-2.09	W (0.02)
13	11/06/01	33.77	-0.22	NW (0.05)
14	02/13/02	36.48	2.71	NW (0.05)
15	05/14/02	35.54	-0.94	N (0.04)
16	08/15/02	34.15	-1.39	W (0.05)
17	11/14/02	34.69	0.54	N (0.08)
18	02/12/03	36.09	1.40	NW (0.03)
19	05/16/03	35.08	-1.01	NW (0.06)
20	08/29/03	33.94	-1.14	NW (0.04)
21	12/02/03	35.39	1.45	NW (0.05)
22	03/08/04	36.50	1.12	NW (0.04)
23	06/08/04	35.17	-1.34	NW (0.02)
24	09/10/04	34.29	-0.88	NW (0.007)
25	12/13/04	36.91	2.63	NW (0.05)
26	03/11/05	37.73	0.81	NW (0.016)
27	06/15/05	36.18	-1.55	NW (0.015)
28	09/08/05	34.59	-1.59	NW (0.042)
29	12/01/05	36.78	2.19	NW (0.040)
30	03/07/06	38.45	1.67	NNE (0.03)
31	06/05/06	36.40	-2.05	NNW (0.022)
32	09/18/06	34.92	-1.48	NW (0.037)
33*	01/03/07	36.14	1.22	NW (0.034)
33**	01/03/07	41.92	----	NW (0.034)

**Notes:**

ft msl = feet above mean sea level

\* = Average water table elevation prior to 1/3/07 calculated using wells MW-1 through MW-4

\*\* = Average water table elevation on 1/3/07 and later calculated using wells MW-1 through MW-4 and MW-6. MW-5 is excluded from the average as it's groundwater elevation is 9.13 feet lower than the average of the other wells.

**TABLE 4: GROUNDWATER ANALYTICAL DATA**  
**Fidelity Roofing, 1075 40th Street, Oakland, California**

Well ID	Date	Depth to Water (ft)	EPA Method SW8015Cm/C (ug/L)		EPA Method SW8021B (ug/L)				
			TPH-g	TPH-d	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes
MW - 1	03/19/97	8.25	<50	<50	23	<0.5	<0.5	<0.5	<0.5
	06/23/97	9.10	1,300	420	14	150	2.1	12	19
	10/08/97	9.95	56	66	5.8	2.8	<0.5	<0.5	<0.5
	01/16/98	7.57	1,500	910	<33	95	0.72	69	8.4
	08/05/99	10.16	160	63	<15	1.6	<0.5	0.56	1.1
	11/18/99	8.52	79	<50	<5.0	<0.5	<0.5	<0.5	<0.5
	02/24/00	7.65	300	160	<5.0	14	0.82	3.5	1.6
	05/24/00	8.47	1,300	480	<10	93	<0.5	17	1.6
	08/29/00	10.28	120	<0.5	<5.0	0.93	<0.5	<0.5	<0.5
	01/12/01	8.50	360	170	<5.0	16	<0.5	9.3	0.69
	04/18/01	8.77	1,100	410	2,800	63	<0.5	34	0.73
	07/27/01	10.50	130	66	<5.0	1.6	<0.5	<0.5	<0.5
	11/06/01	10.28	<50	<50	<5.0	<0.5	<0.5	<0.5	<0.5
	02/13/02	8.47	430	270	<5.0	17	0.51	11	0.64
	05/14/02	9.50	340	170	<5.0	21	<0.5	5.3	0.67
	08/15/02	10.39	96	53	<5.0	0.66	<0.5	<0.5	<0.5
	11/14/02	9.08	<50	<50	<5.0	<0.5	<0.5	<0.5	<0.5
	02/12/03	8.36	710	120	<5.0	28	4.3	32	130
	05/16/03	8.49	1,100	340	<15	54	4.1	40	100
	08/29/03	9.91	1,200	280	<5.0	46	5.1	55	230
	12/02/03	8.88	<50	<50	<5.0	<0.5	<0.5	<0.5	<0.5
	03/08/04	7.66	120	240 <sup>1,2</sup>	<5.0	2.9	<0.5	<0.5	0.71
	06/08/04	9.39	<50	78 <sup>2</sup>	<5.0	<0.5	<0.5	<0.5	<0.5
	09/10/04	9.95	<50	<50	<5.0	<0.5	<0.5	<0.5	<0.5
	12/13/04	6.94	240	150	<5.0	11	<0.5	5.6	<0.5
	03/11/05	7.35	1,100	420	<40	43	0.60	12	0.80
	06/15/05	7.35	440	220	<15	26	<0.5	0.60	<0.5
	09/08/05	9.57	120 <sup>3</sup>	76 <sup>1</sup>	<5.0	2.0	<0.5	<0.5	<0.5
	12/01/05	7.66	<50	<50	<5.0	1.3	<0.5	0.74	<0.5
	03/07/06	7.32	590	150	<5.0	29	0.89	4.4	1.1
06/05/06	8.46	74 <sup>3</sup>	120 <sup>1,2</sup>	<5.0	1.2	<0.5	<0.5	<0.5	
09/18/06	9.36	<50	99 <sup>2</sup>	<5.0	<0.5	<0.5	<0.5	<0.5	
1/3/07	7.99	78	<50	<5.0	1.4	<0.5	0.66	<0.5	
MW - 2	03/19/97	8.40	<50	<50	65	<0.5	<0.5	<0.5	<0.5
	06/23/97	8.85	<50	<50	70	3.4	<0.5	<0.5	<0.5
	10/08/97	9.80	<50	<50	90	<0.5	<0.5	<0.5	<0.5
	01/16/98	5.28	<50	<50	65	<0.5	<0.5	<0.5	<0.5
	08/05/99	9.32	<50	<50	600	<0.5	<0.5	<0.5	<0.5
	11/18/99	10.20	<50	<50	370	<0.5	<0.5	<0.5	<0.5
	02/24/00	7.03	<50	<50	880	<0.5	<0.5	<0.5	<0.5
	05/24/00	8.01	<250	62	2,200	<0.5	<0.5	<0.5	<0.5
	08/29/00	11.07	<200	<50	1,900	<0.5	<0.5	<0.5	<0.5
	01/12/01	8.60	470	70	2,000	8.7	3.1	16	73
	04/18/01	8.80	<50	<50	2,800	<0.5	<0.5	<0.5	<0.5
	07/27/01	11.10	<100	<50	3,300	<0.5	<0.5	<0.5	<0.5
	11/06/01	12.21	<100	<50	3,000	<0.5	<0.5	<0.5	<0.5
	02/13/02	7.98	54	<50	3,200	<0.5	<0.5	<0.5	<0.5
	05/14/02	10.48	<150	<50	3,800	4.8	<1.0	<1.0	<1.0

**TABLE 4: GROUNDWATER ANALYTICAL DATA**  
**Fidelity Roofing, 1075 40th Street, Oakland, California**

Well ID	Date	Depth to Water (ft)	TPH-g	TPH-d	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes
			<i>EPA Method SW8015Cm/C</i> (ug/L)						
MW - 2 continued	08/15/02	10.64	<50	<50	2,900	<0.5	<0.5	<0.5	<0.5
	11/14/02	11.69	<120	<50	3,800	<1.0	<1.0	<1.0	<1.0
	02/12/03	9.07	1,100	120	3,200	57	7	55	210
	05/16/03	11.25	530	85	6,000	35	3.6	22	79
	08/29/03	12.19	2,400	1200	4,800	39	5.8	77	320
	12/02/03	10.96	<100	<50	3,300	<1.0	<1.0	<1.0	<1.0
	03/08/04	8.41	<250	<50	4,600	<2.5	<2.5	<2.5	<2.5
	06/08/04	10.19	<120	<50	3,400	<1.2	<1.2	<1.2	<1.2
	09/10/04	10.84	<250	<250	4,100	<2.5	<2.5	<2.5	<2.5
	12/13/04	8.41	77	<50	4,200	<0.5	0.83	<0.5	1.9
	03/11/05	7.81	120	<50	4,900	14	<0.5	0.56	<0.5
	06/15/05	7.81	1,200	<50	12,000	85	<5.0	<5.0	<5.0
	09/08/05	11.58	<500	<50	8,600	<5.0	<5.0	<5.0	<5.0
	12/01/05	9.03	<500	<50	12,000	<5.0	<5.0	<5.0	<5.0
	03/07/06	7.78	<500	<50	10,000	44	<5.0	<5.0	<5.0
	06/05/06	9.28	890 <sup>6</sup>	1,000 <sup>1,2</sup>	19,000	110	<5.0	<5.0	31
	09/18/06	10.39	2,000 <sup>7,8</sup>	4,100 <sup>1,2</sup>	8,900	<5.0	<5.0	<5.0	<5.0
	01/03/07	8.79	1,500	600 <sup>1</sup>	7,500	150	<5.0	51	59
MW -3	03/19/97	7.59	26,000	5,000	230	3,000	530	340	2,300
	06/23/97	9.98	25,000	7,000	270	4,400	120	540	1,500
	10/08/97	8.36	17,000	5,100	<280	4,400	47	280	410
	01/16/98	9.18	29,000	7,300	<360	5,600	740	950	3,500
	08/05/99	10.56	31,000	5,100	<200	5,400	150	1100	2,300
	11/18/99	10.92	74,000	49,000	<1,000	8,100	5,000	2,100	8,100
	02/24/00	8.49	110,000	6,300	<200	12,000	1,400	2,900	14,000
	05/24/00	8.42	87,000	26,000	<200	13,000	1,900	2,900	14,000
	08/29/00	12.00	49,000	9,400	<200	7,400	800	1,800	7,400
	01/12/01	10.50	69,000	21,000	<300	8,600	980	2,600	11,000
	04/18/01	9.50	75,000	13,000	<500	9,200	1,200	2,500	12,000
	07/27/01	11.61	75,000	85,000	<650	8,700	1,100	2,600	12,000
	11/06/01	11.73	89,000	86,000	<200	7,900	910	2,800	12,000
	02/13/02	9.36	85,000	13,000	<2,000	8,500	830	2,600	11,000
	05/14/02	9.00	94,000	35,000	<1,000	9,700	1,100	3,400	15,000
	08/15/02	11.72	37,000	9,700	<1,200	5,200	430	1,800	5,900
	11/14/02	11.28	66,000	23,000	<1,200	8,300	860	3,000	11,000
	02/12/03	10.17	61,000	8,400	<500	6,800	500	2,400	9,800
	05/16/03	11.47	59,000	17,000	<500	6,200	320	2,000	6,500
	08/29/03	11.92	78,000	100,000	<1,200	6,800	440	2,900	11,000
	12/02/03	11.32	68,000	46,000	<1,000	7,600	450	2,900	10,000
	03/08/04	10.49	79,000	160,000	<250	7,700	570	300	13,000
	06/08/04	9.89	90,000	26,000	<1,200	6,700	580	2,500	13,000
	09/10/04	11.54	NA - Free Product		<100*	7,600*	540*	3,500*	14,000*
	12/13/04	8.91	NA - Free Product = 0.05 ft		-	-	-	-	-
	03/11/05	6.94	NA - Free Product = 0.05 ft		-	-	-	-	-
	06/15/05	6.99	NA - Free Product = 0.12 ft		-	-	-	-	-
09/08/05	10.61	NA - Free Product = 0.64 ft		-	-	-	-	-	
12/01/05	ng	NA - Free Product		-	-	-	-	-	
MW -3	03/07/06	5.26	NA - Free Product = 0.95 ft		-	-	-	-	

**TABLE 4: GROUNDWATER ANALYTICAL DATA**  
**Fidelity Roofing, 1075 40th Street, Oakland, California**

Well ID	Date	Depth to Water (ft)	TPH-g	TPH-d	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes
			<i>EPA Method SW8015Cm/C</i> (ug/L)						
continued	06/05/06	8.09	37,000 <sup>7,4,8</sup>	690,000 <sup>1,2,4,5</sup>	<100	110	10	960	4,400
	06/13/06	8.99	41,000 <sup>6</sup>	28,000 <sup>1,2</sup>	<170	350	24	1,100	4,600
	09/18/06	10.56	NA - Free Product = 0.04ft		-	-	-	-	-
	01/03/07	8.84	NA - Free Product = 0.28ft		-	-	-	-	-
MW-4	08/05/99	8.79	<50	<50	37	<0.5	<0.5	<0.5	<0.5
	11/18/99	8.11	<50	<50	20	<0.5	<0.5	<0.5	<0.5
	02/24/00	5.19	<50	<50	20	<0.5	<0.5	<0.5	<0.5
	05/24/00	7.23	120	140	31	1.3	<0.5	<0.5	<0.5
	08/29/00	9.04	<50	<50	22	<0.5	<0.5	<0.5	<0.5
	01/12/01	6.40	<50	81	25	<0.5	<0.5	<0.5	<0.5
	04/18/01	7.30	30	170	35	2.4	1.1	0.66	4.2
	07/27/01	9.16	87	110	26	1.8	<0.5	2	10
	11/06/01	9.03	200	59	21	4.5	1	5.2	24
	02/13/02	6.60	<50	91	15	<0.5	<0.5	<0.5	<0.5
	05/14/02	7.19	260	140	26	12	2.7	11	49
	08/15/02	8.97	<50	<50	12	<0.5	<0.5	<0.5	<0.5
	11/14/02	7.52	<50	<50	11	<0.5	<0.5	<0.5	<0.5
	02/12/03	6.37	170	130	16	3.1	0.66	6.4	27
	05/16/03	6.81	<50	60	23	<0.5	<0.5	<0.5	<0.5
	08/29/03	8.56	610	120	10	16	2.7	30	130
	12/02/03	6.02	<50	<50	7.7	<0.5	<0.5	<0.5	<0.5
	03/08/04	5.75	<50	<50	10	<0.5	<0.5	<0.5	<0.5
	06/08/04	8.19	<50	<50	11	<0.5	<0.5	<0.5	<0.5
	09/10/04	8.84	<50	<50	10	<0.5	<0.5	<0.5	<0.5
	12/13/04	5.75	<50	<50	16	<0.5	<0.5	<0.5	<0.5
	03/11/05	5.26	<50	<50	16	<0.5	<0.5	<0.5	<0.5
	06/15/05	5.26	<50	<50	15	<0.5	<0.5	<0.5	<0.5
	09/08/05	8.20	<50	54 <sup>2</sup>	16	<0.5	<0.5	<0.5	<0.5
	12/01/05	6.93	<50	<50	13	<0.5	<0.5	<0.5	<0.5
	03/07/06	4.17	<50	<50	11	<0.5	<0.5	<0.5	<0.5
	06/05/06	6.88	<50	<50	11	<0.5	<0.5	<0.5	<0.5
09/18/06	8.33	<50	110	10	<0.5	<0.5	<0.5	<0.5	
01/03/07	6.57	<50	<50	7.9	<0.5	<0.5	<0.5	<0.5	
MW-5	01/03/07	16.47	<50	<50	<5.0	<0.5	<0.5	<0.5	<0.5
MW-6	01/03/07	8.93	<50	63	340	<0.5	<0.5	<0.5	<0.5
VE-1	12/01/05	5.19	140 <sup>3</sup>	540 <sup>2,5</sup>	250	26	13	4.5	15
	03/07/06	2.81	55	na	230	5.2	1.4	2.3	4.5
	06/05/06	5.37	180 <sup>6</sup>	490 <sup>5,2,1</sup>	410	30	4.6	5.8	8.2
	01/03/07	4.92	82	250 <sup>5,2</sup>	320	8.4	1.5	1.7	2.6
AS-1	12/01/05	8.11	<50	na	<5.0	<0.5	0.81	<0.5	1.5
	01/03/07	9.20	<50	130 <sup>5,2</sup>	98	<0.5	<0.5	<0.5	<0.5



**TABLE 4: GROUNDWATER ANALYTICAL DATA**  
**Fidelity Roofing, 1075 40th Street, Oakland, California**

Well ID	Date	Depth to Water (ft)	TPH-g	TPH-d	MTBE	Benzene	Toluene	Ethylbenzene	Xylenes
			<i>EPA Method SW8015Cm/C</i> (ug/L)						
AS-2	12/01/05	9.64	<50	na	<5.0	<0.5	<0.5	<0.5	<0.5
	01/03/07	10.80	<50	910 <sup>5,2</sup>	<5.0	<0.5	<0.5	<0.5	<0.5
DP-1	12/01/05	7.22	220 <sup>2</sup>	na	<5.0	<0.5	2.8	<0.5	0.94
	03/07/06	4.40	<50	na	<5.0	<0.5	0.71	<0.5	1.1
	06/13/06	7.99	<50	67 <sup>2</sup>	<5.0	<0.5	<0.5	<0.5	<0.5
	01/03/07	7.12	<50	93 <sup>2</sup>	<5.0	<0.5	<0.5	<0.5	<0.5
DP-2	12/01/05	6.83	<50	na	59	<0.5	<0.5	<0.5	<0.5
	03/07/06	6.09	230	na	<10	1.2	2.6	<0.5	1.2
	06/13/06	7.98	280 <sup>9</sup>	110 <sup>1,2</sup>	<5.0	<0.5	1.2	<0.5	0.67
	01/03/07	7.45	170	77 <sup>1,2</sup>	<5.0	<0.5	<0.5	<0.5	<0.5
DP-3	12/01/05	7.14	120	na	140	2.1	0.96	<0.5	0.78
	03/07/06	6.62	<50	na	260	<0.5	<0.5	<0.5	<0.5
	06/13/06	9.34	220 <sup>6,9</sup>	88 <sup>1,2</sup>	67	0.57	0.83	<0.5	<0.5
	09/18/06	10.53	78 <sup>9</sup>	110 <sup>2,5</sup>	45	<0.5	1.1	<0.5	0.98
	01/03/07	8.92	<50	150 <sup>2,5</sup>	<5.0	0.60	<0.5	<0.5	<0.5
DP-4	12/01/05	8.43	ns	ns	ns	ns	ns	ns	ns
	03/07/06	7.19	2,400	na	310	570	3.2	38	0.94
	06/13/06	8.71	1,100 <sup>6,9</sup>	250 <sup>1,2</sup>	330	210	2.0	9.2	1.2
	06/13/06	9.56	810 <sup>6</sup>	210 <sup>1,2</sup>	190	190	1.4	11	0.98
	01/03/07	8.33	1,500	260 <sup>1</sup>	200	210	4.1	11	0.54
DP-5	12/01/05	4.69	<50	na	<5.0	<0.5	<0.5	<0.5	<0.5
	03/07/06	2.33	<50	na	<5.0	<0.5	<0.5	<0.5	<0.5
	06/13/06	5.03	<50	140 <sup>2</sup>	5.4	<0.5	<0.5	<0.5	<0.5
	01/03/07	4.98	<50	240 <sup>2,5</sup>	5.5	<0.5	<0.5	<0.5	<0.5
DP-6	12/01/05	5.91	7,000	na	<120	1000	7.8	860	230
	03/07/06	7.11	6,500	na	<160	850	5.9	650	350
	06/13/06	8.73	3,100 <sup>6</sup>	1,500 <sup>1,2</sup>	28	250	1.2	270	120
	09/18/06	9.69	840 <sup>7,8</sup>	570 <sup>1,2</sup>	<10	70	1.3	77	4.5
	01/03/07	7.98	2,400	1,700 <sup>1,2,5</sup>	21	270	3.9	160	30

**Notes:**

ug/L= micrograms per liter

MTBE= Methyl Tertiary Butyl Ether

TPHg= Total Petroleum Hydrocarbons as gasoline

TPHd= Total Petroleum Hydrocarbons as diesel

na = not analyzed

ns = not sampled

ng = not gauged

\* = Analysis by EPA Method 8260

1 - gasoline range compounds are significant

2 - diesel range compounds are significant; no recognizable pattern

3 - unmodified or weakly modified diesel is significant

4 - lighter than water immiscible sheen/product is present

5- oil range compounds are significant

6 - unmodified or weakly modified gasoline is significant

7 - heavier gasoline range compounds are significant (aged gasoline?)

8- no recognizable pattern

9- One to a few isolated non-target peaks present

**APPENDIX A**  
**KECK PRC-91 SPEC SHEET**

Click to go to [www.keck.com](#)

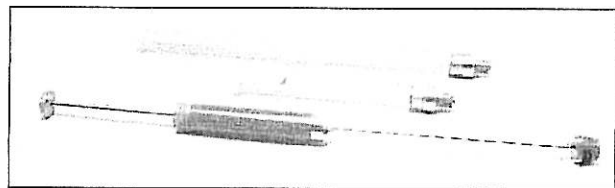
## Oil Skimmers

### **PRC Passive Skimmer**

The Keck PRC is a passive skimmer with a floating intake that separates and recovers light hydrocarbons from groundwater. The Keck PRC collects floating product down to a sheen then is emptied through a discharge valve at the bottom of the canister after being raised to the surface.

#### FEATURES

- Oleophilic / Hydrophobic filter buoy recovers product without taking in water
- Quick fill time - about 15 minutes with ample product
- Protected easy release drain valve
- Able to convert to active recovery systems



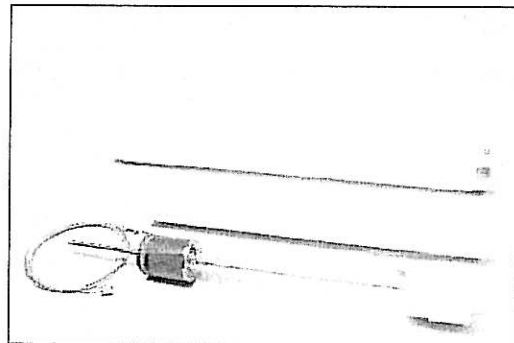
2" Keck PRC Passive Skimmer

#### 2" PRC

- 12" Effective buoy travel
- 3 Recovery capacities: .25, .5 and 1 liter
- Transparent recovery canister
- 2" or larger monitoring well applications

#### 4" PRC

- 16" Effective buoy travel
- 3 Recovery capacities: 1, 3 and 4 liter
- 4" or larger monitoring well applications
- Buoy protected in 0.020 (.5mm) slot PVC screen



4" Keck PRC Passive Skimmer

# Oil Skimmers



## PRC Specifications

	PRC 4"		PRC 2"	
<b>Size</b>	1liter 3liter 4liter	37.0" L (94cm) x 3.5" OD (9cm) 53.0" L (135cm) x 3.5" OD (9cm) 60.0" L (152cm) x 3.5" OD (9cm)	.25 liter .5 liter 1 liter	49.0" L (149cm) x 1.75" OD (4.4cm) 59.5" L (151cm) x 1.75" OD (4.4cm) 82.5" L (210cm) x 1.75" OD (4.4cm)
<b>Weight</b>	1liter 3liter 4liter	8.lbs (3.7kg) empty, 9.5lbs (4.3kg) full 15.lbs (6.8kg) empty, 19lbs (8.6kg) full 16.lbs (8.2kg) empty, 25.5lbs (11.6kg) full	.25 liter .5 liter 1 liter	3.1lbs (1.4kg) empty, 3.5lbs (1.6kg) full 3.5lbs (1.6kg) empty, 4.3lbs (2.0kg) full 5.2lbs (2.4kg) empty, 6.7lbs (3.0kg) full
<b>Capacity</b>	1liter 3liter 4liter	.26gal .8gal 1.06gal	.25 liter .5 liter 1 liter	.07gal 0.13gal 0.26gal
<b>Minimum water required</b>	1liter 3liter 4liter	18.5" (47cm) 35.0" (89cm) 43.0" (109cm)	.25 liter .5 liter 1 liter	29.0" (74cm) 39.5" (100cm) 62.0" (157cm)
<b>Materials</b>	All	Stainless steel, brass, and engineered plastics	All	Stainless steel, brass, and engineered plastics