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## 1.0 INTRODUCTION

This report describes the activities and results of the soil vapor investigation performed by AEI Consultants for the property located at 1353 International Blvd., Oakland, California (Figure 1: Site Location Map). The investigation included the collection and analyses of eight soil vapor samples from borings drilled on the property. The investigation was designed to assess whether significant vapor phase contaminants are present in the shallow soil around the previously identified release. The investigation activities were performed in response to the Alameda County Health Care Services Agency (ACHCSA) letter to Mr. Norman Foss dated February 7, 2007. This investigation was proposed in AEI's Work Plan to the ACHCSA dated July 25, 2007 and approved by the ACHCSA in a letter dated August 17, 2007.

## 2.0 SITE DESCRIPTION AND HISTORY

The subject property at the time of investigation supported the operation of a tropical fish and aquarium supply store bordering the front of the property along International Blvd. Foss Lampshades occupies the rear of the property approximately 70 feet from International Blvd. Formerly, the property was occupied by Style Center Cleaners, a dry cleaning facility for approximately 50 years until approximately 2001 (Figure 2: Site Plan). The floor of the building is wooden with a crawl space separating the floor from the ground cement slab. The property is surrounded by commercial properties bounded by International Boulevard to the north, a construction supply yard to the east followed by 14<sup>th</sup> Avenue, Foss Lampshade Studios to the south, and a commercial public storage and office building (located approximately 6 feet in elevation higher than the dry cleaner) to the west. Refer to Figure 2 for the extended site plan.

On August 26, 1996, Ms. Madhulla Logan of the ACHCSA requested that a soil and groundwater investigation be performed on the property. The investigation was requested to determine if the on-site dry cleaning facility was a source of solvent contamination found in the groundwater at the former General Tire site, located adjacent to the subject property.

Three groundwater monitoring wells were installed at the former General Tire site between March, 1992 and September, 1993 by Jonas & Associates, Inc. The wells (labeled MW-1, MW-2 and MW-3) were installed to investigate petroleum hydrocarbon contamination. During quarterly monitoring of the wells, PCE and trichloroethene (TCE) were present in groundwater samples collected from MW-2 at concentrations ranging from 14 micrograms per liter ( $\mu\text{g/L}$ ) to 44  $\mu\text{g/L}$ .

AEI performed a subsurface investigation at the subject property on December 13, 1996. The investigation included advancing five soil borings (BH-1 through BH-5). Concentrations of PCE were detected in all analyzed soil samples at concentrations ranging from 8.7 micrograms per kilogram ( $\mu\text{g/kg}$ ) to 150  $\mu\text{g/kg}$ . TCE and chloroform were detected in the soil at maximum concentrations of 0.45  $\mu\text{g/kg}$  and 640  $\mu\text{g/kg}$ , respectively. No other volatile halocarbons were detected above the method detection limit. PCE, TCE and chloroform were present in grab groundwater samples collected from four of the soil borings at maximum concentrations of 1100  $\mu\text{g/l}$ , 3.0  $\mu\text{g/l}$  and 4.8  $\mu\text{g/l}$ , respectively.

On July 3, 1997, AEI installed a single groundwater monitoring well (AE-1) located approximately 10 feet down-gradient from the dry cleaning machine (Figure 2, Ref. 2). Groundwater samples were collected from the well on July 31, 1997. Groundwater samples were also collected from MW-1 and MW-2 located on the adjacent site. MW-3 was not sampled. The four wells were surveyed in order to determine groundwater flow direction and gradient during each monitoring episode. Well AE-1 was monitored on a quarterly basis whereas the off-site wells were monitored on a semi-annual basis. No volatile halocarbons were detected in groundwater samples collected from AE-1, the on-site well during the monitoring episodes on July 31, 1997, November 6, 1997 and March 3, 1998 (Ref. 2, 3, 4). Refer to Table 2 for a summary of the analytical results from the groundwater monitoring episodes.

### **3.0 INVESTIGATIVE EFFORTS**

Prior to mobilization onsite, Underground Service Alert North was notified to identify public utilities in the planned work area. A permit was obtained from the Alameda County Public Works Agency (# W2007-1189). The investigation was designed to include soil gas sample analyses performed in the field and to allow for real-time data review and adjustments to the sampling locations, as needed to readily characterize the nature of the release.

#### **3.1 Soil Vapor Sample Collection**

AEI performed the drilling and sampling at the property on December 11, 2007. A total of eight (8) soil borings (SG-1 and SG-3 through SG-9) were advanced. Two (2) of the borings were placed inside of the former dry-cleaning operation and six (6) borings were placed outside the building to the east within the property driveway. The locations of the soil borings are shown on Figure 3.

The soil vapor borings were advanced by TEG (CA C57 License # 706568). The soil vapor probes were constructed of 1 inch outer diameter chrom-moly steel, equipped with a steel sacrificial tip. An inert 1/8 inch tube ran through the center of the probe and was attached to the sampling port with a stainless steel post run fitting. The probes were driven into the ground with either an electric rotary hammer or a direct push Geoprobe<sup>®</sup> rig. After inserted to the desired depth (five feet bgs), the probe was retracted slightly, which opened the tip and exposed the vapor sampling port. Once the probe rod was placed, the sample was collected after waiting approximately twenty minutes for equilibrium. AEI did not encounter no flow conditions during the vapor sampling.

Soil vapor was withdrawn from the inert tubing using a calibrated syringe connected via an on-off valve. A purge volume test was conducted by sampling at the first soil vapor location (SG-4) three times after sequentially collecting and discarding one, three, and seven dead volumes of soil vapor gas to flush the sample tubing and filled it with in-situ soil vapor. The purge volume used prior to the sample yielding the highest analytical value was used for all subsequent sampling. After purging, the next 20cc to 50cc of soil vapor were withdrawn in the syringe, plugged, and immediately transferred to the mobile lab for analysis within the required holding time. During sampling, a leak check gas was used to confirm that the sample train and probe rod was tight and

leak free. To minimize the potential for cross-contamination between sampling locations, all external probe parts were cleaned of excess dirt and moisture between sampling locations. The internal inert tubing and sampling syringes were discarded after each sample.

### **3.2 Boring Destruction**

Upon completion of sampling and measurement activities, all sampling equipment was removed from the boreholes. Each boring was backfilled with neat cement grout to the existing grade.

### **3.3 Laboratory Analysis**

Soil vapor samples were analyzed by TEG (Department of Health Services Certification #1671), an onsite mobile laboratory. Soil vapor samples were analyzed for select volatile organic compounds (VOCs) by EPA Method 8260B.

Analytical results and chain of custody documents are included as Appendix A.

## **4.0 FINDINGS**

VOCs were detected in the soil vapor samples as follows:

PCE was detected in each of the eight soil vapor samples at concentrations ranging from 0.10 µg/L (SG-1) to 37 µg/L (SG-4).

TCE was detected in two soil vapor samples SG-7 and SG-9 at concentrations of 0.24 µg/L and 1.6 µg/L, respectively.

The remaining VOCs analyzed were not detected at or above the laboratory detection limit in the soil vapor samples collected. Soil vapor analytical data is summarized in Table 2 and Figure 4.

## **5.0 SUMMARY**

AEI performed the subsurface investigations at the site property on December 11, 2007. A total of eight (8) soil borings (SG-1 and SG-3 through SG-9) were advanced. Borings were placed in and around the former dry cleaners to determine if known PCE in the soil was present in the soil vapor as a potential threat for vapor intrusion into the building.

Results of this investigation have been compared to Environmental Screening Levels (ESLs) which were developed by the San Francisco Bay Regional Water Quality Control Board (SFB RWQCB) to assist in evaluating risk posed by contaminant releases. These values are not statutory cleanup goals or requirements but rather for use as a screening tool to evaluate site data. The ESLs selected for reference herein are for shallow soils and soil vapor at commercial/industrial sites and consider the potential for vapor intrusion and leaching to groundwater (Table E2, SBR RWQCB, November 2007). Although these ESL values may not ultimately be applicable for the site, they are based on

2007). Although these ESL values may not ultimately be applicable for the site, they are based on generally accepted risk evaluation and fate and transport modeling methods and are deemed appropriate as a preliminary evaluation tool.

PCE was detected in soil vapor samples at concentrations ranging from 0.10 µg/L (SG-1) to 37 µg/L (SG-4), and TCE was detected in two borings at concentrations of 0.24 µg/L (SG-7) and 1.6 µg/L (SG-9). The TCE detections were not above the ESL for TCE (4.1 µg/L); however, each of the PCE concentrations in each of the soil vapor probes (with the exception of SG-1) exceeded the commercial ESL for PCE of 1.4 µg/L. The highest concentration of PCE in the soil vapor was present in boring SG-4, immediately south of the former dry cleaning machine. PCE concentrations decreased with distance from the former dry cleaning machine and were delineated to below the commercial ESL towards the northeast (SG-1).

## 6.0 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.

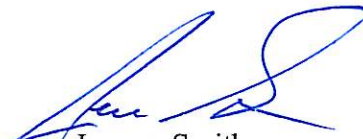
These services were performed in accordance with generally accepted practices, in the environmental engineering and construction field, which existed at the time and location of the work.

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

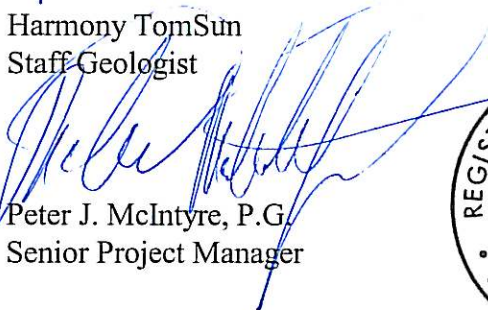
Sincerely,  
**AEI Consultants**



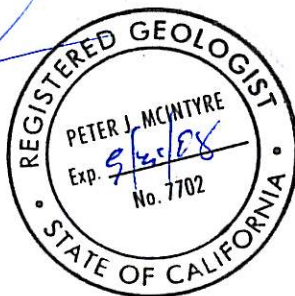
Harmony TomSun  
Staff Geologist



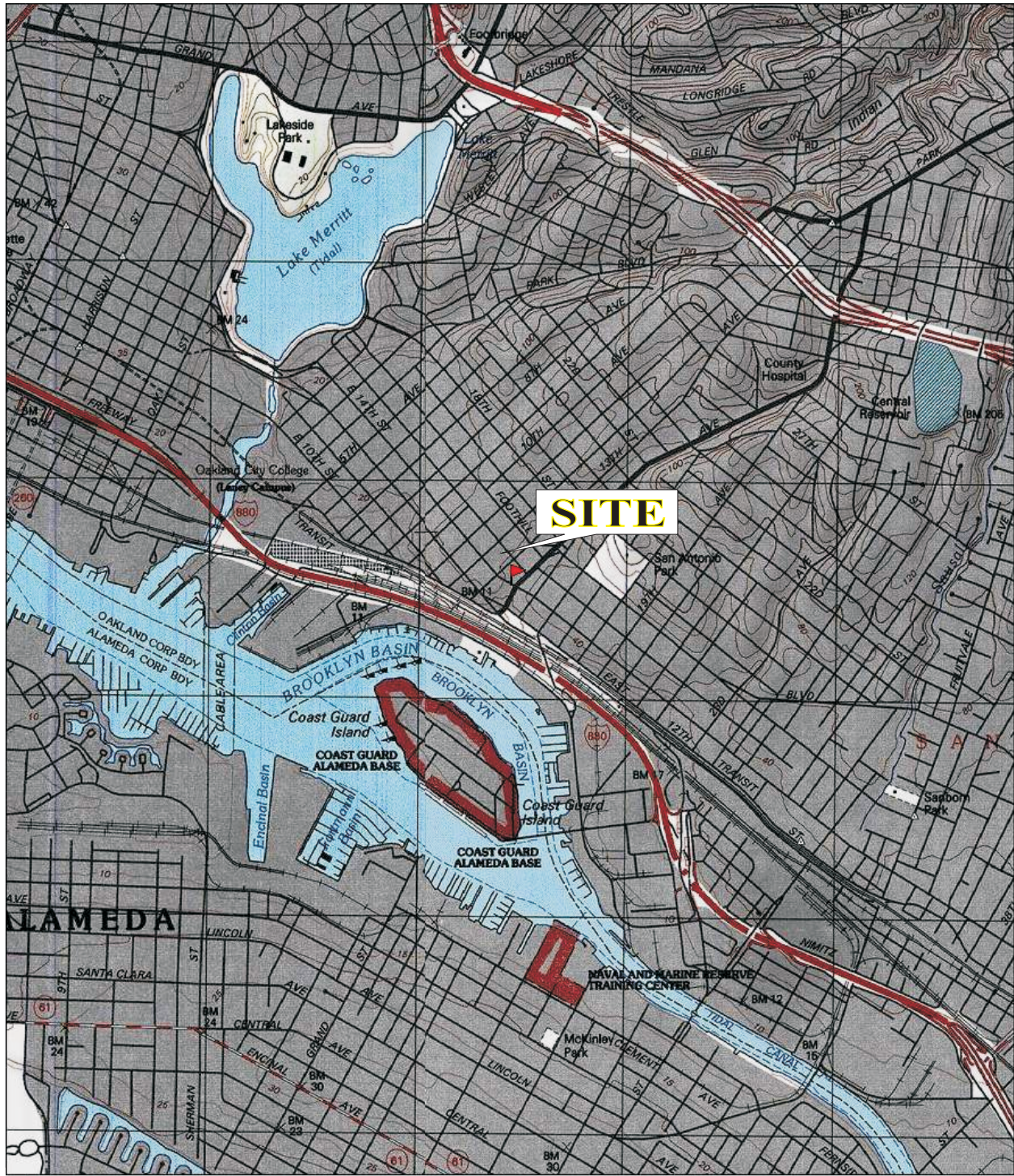
Jeremy Smith  
Project Manager



Peter J. McIntyre, P.G.  
Senior Project Manager



## **FIGURES**



**SITE**

TN ↑ MN  
15°

0 5 1 MILE  
0 1000 FEET 0 500 1000 METERS  
Map created with TOPO!® ©2002 National Geographic (www.nationalgeographic.com/topo)

<p><b>AEI CONSULTANTS</b> 2500 Camino Diablo, Suite 200, Walnut Creek, CA 94597</p>	
<p><b>SITE LOCATION PLAN</b></p>	
<p>1353 International Blvd. Oakland, CA 94606</p>	<p><b>FIGURE 1</b> Job No: 272297</p>

Commercial  
Property

Commercial  
Property

INTERNATIONAL BLVD

Offices and Commercial  
Storage Facility  
(Elevation~6'  
above floor of  
former dry  
cleaner)

Aquarium/Fish  
Supply Store  
(Former Dry  
Cleaner)

ASPHALT  
DRIVEWAY

Construction  
Supply  
Yard

Foss  
Lampshade  
Studio  
Building




14TH AVENUE

SIDEWALK

SIDEWALK



**LEGEND**

-  Fence
-  Driveway Gate
-  Building Outline

**AEI CONSULTANTS**

2500 CAMINO DIABLO, SUITE 200, WALNUT CREEK, CA

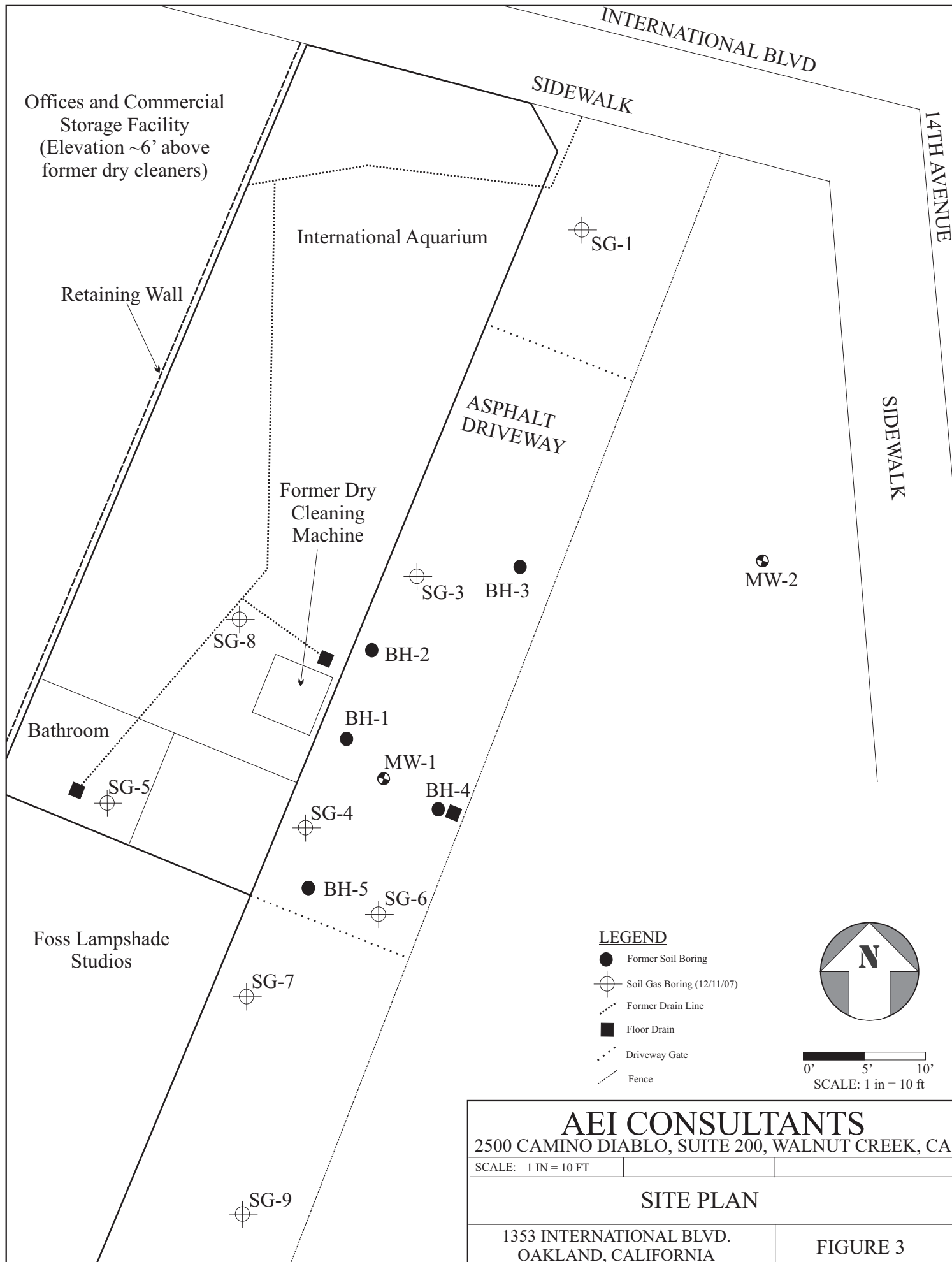
SCALE: Not to Scale

**EXTENDED SITE PLAN**

1353 INTERNATIONAL BLVD.  
OAKLAND, CALIFORNIA

FIGURE 2





Offices and Commercial Storage Facility  
(Elevation ~6' above former dry cleaners)

Retaining Wall

International Aquarium

SIDEWALK

INTERNATIONAL BLVD

14TH AVENUE

SIDEWALK

ASPHALT DRIVEWAY

Former Dry Cleaning Machine

MW-2

SG-3 BH-3

SG-8 BH-2

Bathroom

BH-1

SG-5

MW-1

BH-4

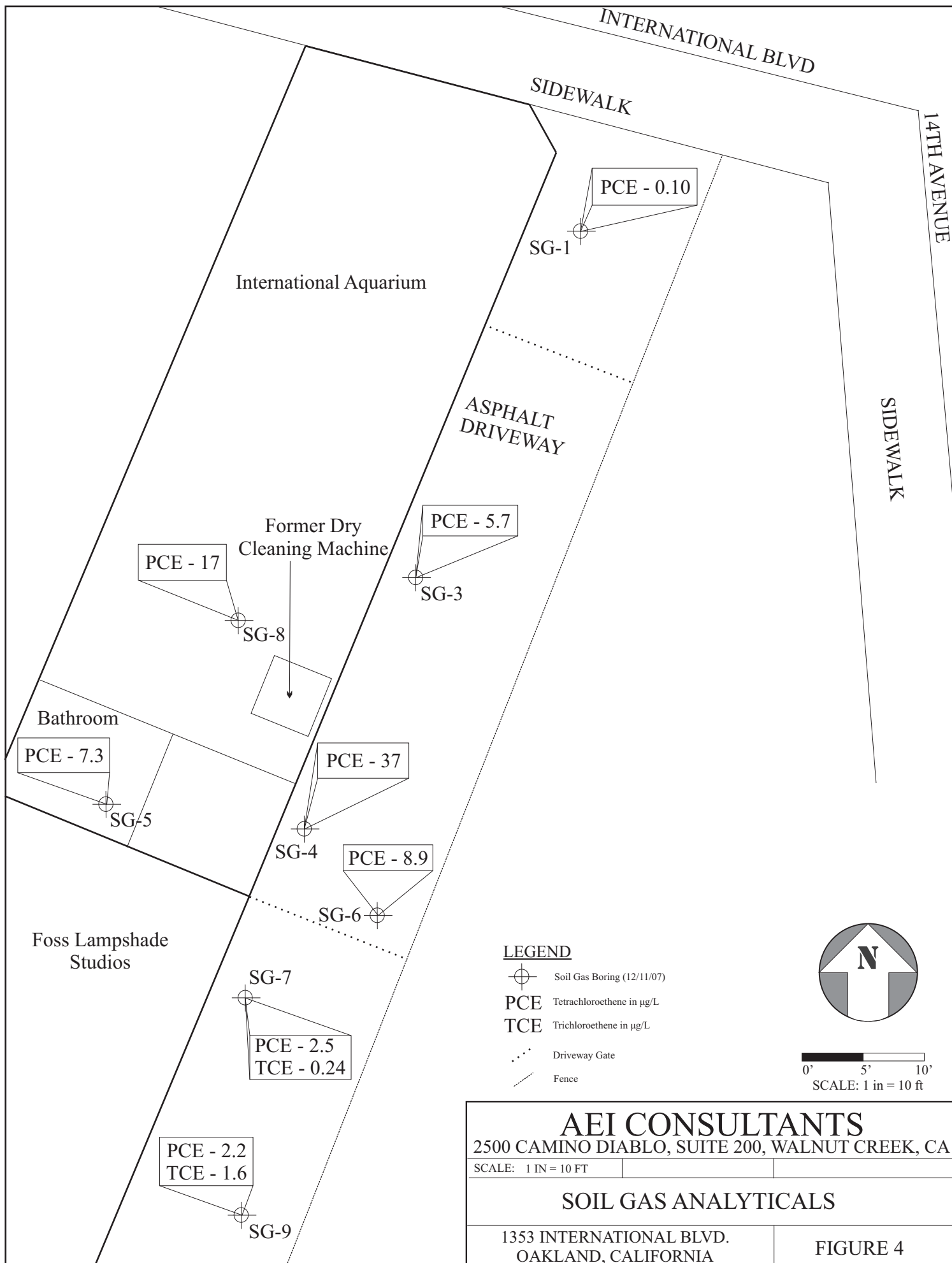
SG-4

Foss Lampshade Studios

BH-5 SG-6

SG-7

SG-9



PCE - 0.10  
SG-1

International Aquarium

PCE - 5.7  
SG-3

PCE - 17  
SG-8

Former Dry Cleaning Machine

Bathroom  
PCE - 7.3  
SG-5

PCE - 37  
SG-4

PCE - 8.9  
SG-6

Foss Lampshade Studios

SG-7  
PCE - 2.5  
TCE - 0.24

PCE - 2.2  
TCE - 1.6  
SG-9



0' 5' 10'  
SCALE: 1 in = 10 ft

## **TABLES**

**Table 1**  
**1353 International Blvd., Oakland, CA**  
**Soil Gas Sample Data**

Sample ID	Date Sampled	Purge Volume	PCE µg/L	TCE µg/L	All Others µg/L
<i>EPA method 8260B VOC</i>					
SG-1	12/11/2007	7	0.10	ND<0.10	All < RL
SG-3	12/11/2007	7	5.7	ND<0.10	All < RL
SG-4	12/11/2007	1	29	ND<0.10	All < RL
SG-4	12/11/2007	3	28	ND<0.10	All < RL
SG-4	12/11/2007	7	37	ND<0.10	All < RL
SG-5	12/11/2007	7	7.3	ND<0.10	All < RL
SG-6	12/11/2007	7	8.9	ND<0.10	All < RL
SG-7	12/11/2007	7	2.5	0.24	All < RL
SG-8	12/11/2007	7	17	ND<0.10	All < RL
SG-9	12/11/2007	7	2.2	1.6	All < RL
ESL	-	-	1.4	4.1	-

Notes:

PCE = Tetrachloroethene

TCE = Trichloroethene

µg/L = micrograms per liter

ESL = Environmental Screening Level for commercial properties as determined by the RWQCB

See Appendix A for laboratory report details

**Table 2**  
**1353 International Blvd., Oakland, CA**  
**Historical Groundwater Sample Data**

Sample ID	Date	PCE µg/L	TCE µg/L	1,1-DCE µg/L	c-1,2-DCE µg/L	t-1,2-DCE µg/L	1,1-DCA µg/L	Chloroform µg/L	Vinyl Chloride µg/L
<i>EPA method 601</i>									
<i>Groundwater Monitoring Wells</i>									
<b>AE-1</b>	7/31/1997	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	11/6/1997	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	3/3/1998	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5
	6/15/1998	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5
<b>MW-1</b>	7/31/1997	ND<0.5	ND<0.5	ND<0.5	0.80	ND<0.5	0.63	ND<0.5	ND<0.5
	11/6/1997	NS	NS	NS	NS	NS	NS	NS	NS
	3/3/1998	ND<0.5	0.95	ND<0.5	2.0	ND<0.5	2.0	ND<0.5	ND<0.5
	6/15/1998	NS	NS	NS	NS	NS	NS	NS	NS
<b>MW-2</b>	7/31/1997	27	100	1.4	46	1.9	ND<1.0	ND<1.0	2.3
	11/6/1997	NS	NS	NS	NS	NS	NS	NS	NS
	3/3/1998	3.7	14	0.57	6.6	ND<0.5	ND<0.5	ND<0.5	1.4
	6/15/1998	NS	NS	NS	NS	NS	NS	NS	NS
<i>Soil Borings - December 1996</i>									
BH-1 W	12/16/1996	1,100	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25
BH-3 W	12/16/1996	22	3.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5	4.8	ND<0.5
BH-4 W	12/16/1996	220	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10.0	ND<10
BH-5 W	12/16/1996	24	0.85	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<5.0	ND<0.5

Notes:

PCE = Tetrachloroethene  
TCE = Trichloroethene  
1,1-DCE = 1,1-Dichloroethene  
c-1,2-DCE = cis-1,2-Dichloroethene  
t-1,2-DCE = trans-1,2-Dichloroethene  
1,1-DCA = 1,1-Dichloroethane  
µg/L = micrograms per liter  
ND = Not detected  
NA = Not analyzed

Compounds not listed not reported at or above the laboratory detection limit. See individual laboratory report for details

**Table 3**  
**1353 International Blvd., Oakland, CA**  
**Histoical Soil Sample Data**

Sample ID	Date Sampled	PCE µg/kg	TCE µg/kg <i>EPA method 601</i>	Chloroform µg/kg	All Others µg/kg
BH-1, L3 (8')	12/13/1996	87	ND<5.0	640	All < RL
BH-2, L3 (8')	12/13/1996	45	0.034	0.039	All < RL
BH-3, L3 (8')	12/13/1996	150	ND<0.005	ND<0.005	All < RL
BH-4, L3 (8')	12/13/1996	8.7	0.064	0.24	All < RL
BH-5, L3 (8')	12/13/1996	20	0.45	9.6	All < RL

Notes:

PCE = Tetrachloroethene

TCE = Trichloroethene

µg/kg = micrograms per kilogram

See laboratory report for details

## **APPENDIX A**

# **LABORATORY ANALYTICAL DOCUMENTATION**



3 January 2008

Ms. Harmony Tomsun  
AEI Consultants  
2500 Camino Diablo, Suite 200  
Walnut Creek, CA 94597

**SUBJECT: DATA REPORT - AEI Consultants Project # 276046  
1353 International Boulevard, Oakland, California**

**TEG Project # 71211F**

Ms. Tomsun:

Please find enclosed a data report for the samples analyzed from the above referenced project for AEI Consultants. The samples were analyzed on site in TEG's mobile laboratory. TEG conducted a total of 11 analyses on 11 soil vapor samples.

-- 11 analyses on soil vapors for selected volatile organic hydrocarbons by EPA method 8260B.

The results of the analyses are summarized in the enclosed tables. Applicable detection limits and QA/QC data are included in the tables.

1,1 difluoroethane was used as a leak check compound around the probe rods during the soil vapor sampling. No 1,1 difluoroethane was detected in any of the vapor samples reported at or above the DTSC recommended leak check compound reporting limit of 10 µg/L of vapor.

TEG appreciates the opportunity to have provided analytical services to AEI Consultants on this project. If you have any further questions relating to these data or report, please do not hesitate to contact us.

Sincerely,

Mark Jerpbak  
Director, TEG-Northern California





AEI Consultants, Inc. Project # 276046  
 1353 International Boulevard  
 Oakland, California

TEG Project #71211F

EPA Method 8260B VOC Analyses of SOIL VAPOR in ug/L of Vapor

SAMPLE NUMBER:		Probe Blank	SG-1	SG-3	SG-4	SG-4	SG-4
SAMPLE DEPTH (feet):			5.0	5.0	5.0	5.0	5.0
PURGE VOLUME:			7	7	1	3	7
COLLECTION DATE:		12/11/07	12/11/07	12/11/07	12/11/07	12/11/07	12/11/07
COLLECTION TIME:		08:30	14:02	14:21	09:06	09:30	09:51
DILUTION FACTOR (VOCs):		1	1	1	1	1	1
	RL						
Vinyl Chloride	0.10	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	0.10	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	0.10	nd	nd	nd	nd	nd	nd
Trichloroethene	0.10	nd	nd	nd	nd	nd	nd
Tetrachloroethene	0.10	nd	0.10	5.7	29	28	37
1,1 Difluoroethane (leak check)	10	nd	nd	nd	nd	nd	nd
Surrogate Recovery (DBFM)		86%	81%	82%	75%	83%	81%
Surrogate Recovery (Toluene-d8)		85%	80%	77%	73%	82%	77%
Surrogate Recovery (1,4-BFB)		79%	77%	76%	70%	76%	73%

SAMPLE NUMBER:		SG-5	SG-6	SG-6 dup	SG-7	SG-8	SG-9
SAMPLE DEPTH (feet):		4.5	5.0	5.0	5.0	5.0	5.0
PURGE VOLUME:		7	7	7	7	7	7
COLLECTION DATE:		12/11/07	12/11/07	12/11/07	12/11/07	12/11/07	12/11/07
COLLECTION TIME:		11:09	10:15	11:32	10:39	12:26	15:22
DILUTION FACTOR (VOCs):		1	1	1	1	1	1
	RL						
Vinyl Chloride	0.10	nd	nd	nd	nd	nd	nd
trans-1,2-Dichloroethene	0.10	nd	nd	nd	nd	nd	nd
cis-1,2-Dichloroethene	0.10	nd	nd	nd	nd	nd	nd
Trichloroethene	0.10	nd	nd	nd	0.24	nd	1.6
Tetrachloroethene	0.10	7.3	8.9	8.1	2.5	17	2.2
1,1 Difluoroethane (leak check)	10	nd	nd	nd	nd	nd	nd
Surrogate Recovery (DBFM)		86%	89%	82%	80%	80%	88%
Surrogate Recovery (Toluene-d8)		84%	87%	79%	76%	80%	86%
Surrogate Recovery (1,4-BFB)		83%	79%	74%	76%	76%	79%

'RL' Indicates reporting limit at a dilution factor of 1  
 'nd' Indicates not detected at listed reporting limits

Analyses performed in TEG-Northern California's lab  
 Analyses performed by: Mr. Jon Edmondson



AEI Consultants, Inc. Project # 276046  
1353 International Boulevard  
Oakland, California

TEG Project #71211F

CALIBRATION STANDARDS - Initial Calibration / LCS

Instrument: Agilent 5973N MSD

COMPOUND	INITIAL CALIBRATION		LCS	
	RF	%RSD	RF	%DIFF
Vinyl Chloride*	0.387	12.7%	0.404	4.4%
trans-1,2-Dichloroethene	0.271	6.6%	0.277	2.2%
cis-1,2-Dichloroethene	0.289	5.8%	0.307	6.2%
Trichloroethene	0.292	10.2%	0.299	2.4%
Tetrachloroethene	0.320	5.4%	0.341	6.6%
Acceptable Limits		20.0%		15.0%

\*\*\* Indicates RSD not to exceed 30% & LCS not to exceed 25%