

**WEECO WESTERN ENVIRONMENTAL ENGINEERS CO.**

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**January 29, 2018**

**Mr. Bryan Kim  
Open Bank / CLC III  
1000 Wilshire Boulevard, Suite 100  
Los Angeles, CA 90017**

**RE: Phase II Environmental Site Assessment  
3441 & 3441½ W. 8<sup>th</sup> Street  
Los Angeles, CA 90005  
WEECO Project No.: 2018-6646B**

Dear Mr. Kim:

Western Environmental Engineers Company (WEECO) has completed a Phase II Environmental Site Assessment at the former dry cleaners facility at 3441 & 3441½ W. 8<sup>th</sup> Street, Los Angeles, California (the Site). The purpose of this assessment was to investigate soil quality at the Site.

WEECO appreciates the opportunity to work on this investigation project. Should you have any questions concerning the information provided herein or in the accompanying report, please contact James Yoon or Sin H. Kim at (714) 542-2644.

Respectfully,  
Western Environmental Engineers Company



James Yoon, REPA  
Project Manager



Sin Han Kim, P.E.  
Principal Engineer  
Registered Civil Engineer  
California Registration No. C62688



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## 1.0 INTRODUCTION

This report presents the results of Phase II Environmental Site Assessment activities conducted by Western Environmental Engineers Company (WEECO) for former dry cleaners facility located at 3441 & 3441½ W. 8<sup>th</sup> Street, Los Angeles, California (the Site) (Figure 1).

The purpose of this site investigation was to gather detailed information about the contaminants in the former dry cleaners facility, and to determine the contaminants existing on site and to approximate the volume of the contaminants' plumes, if necessary. This Environmental Site Assessment report contains a brief history of the existing site characteristics, sample collection procedures, analytical results and other supporting data, as well as conclusions and recommendations.

## 2.0 BACKGROUND

### 2.1 SITE DESCRIPTION

The subject property located at 744-762 S. Hobart Boulevard, 3431-3455 W. 8<sup>th</sup> Street, and 749-767 S. Harvard Boulevard, in the City of Los Angeles, is legally described by the assessor's parcel numbers: 5093-018-007, 5093-018-008, 5093-018-009, 5093-018-017, 5093-018-018, 5093-018-019, and 5093-018-020. According to the Los Angeles County, Office of the Assessor, the subject site is an approximately 63,152 square foot lot, and has been developed with seven (7) commercial and residential buildings approximately 47,908 square feet in size total. The subject buildings were constructed in 1912/1915, 1939/1942, 1940, 1941, 1951, 1963, and 1966, respectively.

The subject property is currently occupied by "Seedcure, Inc" (3431 W. 8<sup>th</sup> Street), "Han Chong Sin" (3431-B W. 8<sup>th</sup> Street), "G Beauty Salon" (3433 W. 8<sup>th</sup> Street), "Nicholas Gant" (3435 W. 8<sup>th</sup> Street), "Avila Tax Service" (3437 W. 8<sup>th</sup> Street), "G Q Tailor" (3439 W. 8<sup>th</sup> Street), "Shipyn" (3441 W. 8<sup>th</sup> Street), Vacant Unit (3441½ W. 8<sup>th</sup> Street), "My Love Golf" (3443 W. 8<sup>th</sup> Street), "Robert Lawson" (3445 W. 8<sup>th</sup> Street), "Top's Office & Art Supplies" (3447 W. 8<sup>th</sup> Street), "Robert M. Lawson" (3451 W. 8<sup>th</sup> Street), "La Fleur" (3453 W. 8<sup>th</sup> Street), "Dong Il Jang Restaurant" (3455 W. 8<sup>th</sup> Street), Residential Building (749 W. 8<sup>th</sup> Street), "World of String Art" (765 S. Harvard Boulevard), and "J.S.K. Company" (767 S. Harvard Boulevard). The subject property consists of a total of six (6) buildings: three (3) single-story commercial buildings, one (1) single-story residential building, and two (2) two-story commercial buildings. Onsite operations include a restaurant, office tenants, commercial tenants, and residential dwelling. Two (2) storage enclosures were observed at the subject site. In addition to the current structures, the subject property is also improved with an asphalt paved parking area.

### 2.2 SITE ENVIRONMENTAL HISTORY

#### 2.2.1 HISTORIC OPERATIONS

According to the Historical Tenant Report, the subject site at 3441 W. 8<sup>th</sup> Street is occupied by a dry cleaners prior to 1965.

#### 2.2.2 PREVIOUS INVESTIGATIONS

Based on the Phase I ESA report dated January 24, 2018, the subject site at 3441 W. 8<sup>th</sup> Street is occupied by a dry cleaners prior to 1965. Therefore, WEECO recommended that further investigation is necessary to characterize the subsurface soil condition at this time.

#### 2.2.3 Adjacent Properties

During the Site Reconnaissance, WEECO's field assessor has visually inspected and documented the use of the adjacent properties, and findings are as follows:

##### NORTH

- The properties to the north of the subject site are used for residential purposes (Residential / 740 S. Hobart Boulevard and 743 S. Harvard Boulevard).

##### EAST

- The properties to the east of the subject site across Harvard Boulevard are used for commercial and residential purposes (Multi-Tenant Commercial Building and Residential / 3411-3429 W. 8<sup>th</sup> Street and 742-758 S. Harvard Boulevard).

SOUTH

- The properties to the south of the subject site across 8<sup>th</sup> Street are used for commercial and residential purposes (Multi-Tenant Commercial Building and Residential / 3428-3444 W. 8<sup>th</sup> Street and 808 S. Hobart Boulevard).

WEST

- The properties to the west of the subject site across Hobart Boulevard are used for commercial purposes (Multi-Tenant Commercial Building and “Heyri Coffee House” / 3461-3467 W. 8<sup>th</sup> Street and 755 S. Hobart Boulevard) and parking area.

### 3.0 GEOLOGY AND HYDROGEOLOGY

Based on soil borings advanced to assess the Site, subsurface soil generally consists of silt (surface to 5 feet bgs). The color of the soil ranged from medium brown to dark brown; the consistency of the soil was moist. Groundwater was not encountered during drilling activities.

The subject site is in the Los Angeles Forebay Area, located in the northern part of the Central Basin. In general, it is a free groundwater area; however, in the course of this investigation it became evident that the Bellflower aquiclude extends into the southerly portion of the forebay area. The aquiclude extends in this area contains a high percentage of sand, and vertical percolation of water is apparently more rapid here than in other portions of the basin covered by it. Where the Bellflower aquiclude is missing within the forebay area, the aquifers are in direct hydraulic continuity with the surface.

The Los Angeles Forebay Area is overlain by parts of the La Brea, Los Angeles and Montebello Plains. The known water-bearing sediments extend to a depth of 1600 feet (1440 feet below sea level) and include recent alluvium, the Lakewood formation and the San Pedro formation. Some fresh water also may be present in the Pliocene and Miocene rocks underlying these formations in this area.

Recent alluvium in the Los Angeles Forebay Area is found on the Los Angeles Plain and in the Los Angeles Narrows. It attains a maximum thickness of 160 feet, and includes the western arm of Gaspar aquifer and the parts of the Semi-perched aquifer and Bellflower aquiclude lying west and south of the Los Angeles River.

The Semi-perched aquifer is defined as the area where sand and gravel overlying the Bellflower aquiclude is more than 20 feet in thickness. This semi-perched aquifer is also present in the Lakewood formation just south of the Repetto Hill. Although the aquifer can be defined in well logs, water levels in well indicate that it contains little or no water.

The groundwater depth of the subject site ranges from approximately 14.1 to 34.07 feet bgs (data obtained from GeoTracker from a closed LUST site, 3401 8<sup>th</sup> Street). The regional groundwater flow is expected to follow the topographic gradient; which is towards the southwesterly.

## 4.0 SOIL GAS SURVEY METHODOLOGY

### 4.1 GENERAL DISCUSSION

Soil volatile organic compound (VOC) contamination can be detected by analyzing trace gases in soil below grade surface. This technique is possible because many VOCs will volatilize and move by molecular diffusion away from source areas toward regions of lower concentrations. A gas phase concentration gradient from the source to adjacent area is established.

Soil gas surveys are often used in conjunction with other site-specific data. In this case, the soil gas survey was employed to screen potential areas of VOC concentrations.

The soil gas sample collection was conducted in general accordance with the "Department of Toxic Substances Control Advisory-- Active Soil Gas Investigation" in July 2015.

### 4.2 SAMPLING PROBE INSTALLATION

On January 29, 2018, soil vapor sampling was performed by hydraulically pushing soil gas probes to a depth of approximately 5-feet bgs for boring locations SV-1 through SV-4 as following respective locations:

SV-1: near back of the former dry cleaners (3441½ W. 8<sup>th</sup> Street)

SV-2: near front of the dry cleaners (3441½ W. 8<sup>th</sup> Street)

SV-3: near back of the former dry cleaners (3441 W. 8<sup>th</sup> Street)

SV-4: near front of the dry cleaners (3441 W. 8<sup>th</sup> Street)

An electric rotary hammer drill was used to drill a 1.0-inch diameter hole through the overlying concrete/asphalt to allow probe placement when required. The same electric hammer drill was used to push probes in areas of resistance during placement.

### 4.3 SAMPLE COLLECTION AND HANDLING

On January 29, 2018, Optimal Technology collected soil vapor samples and analyzed the samples using an onsite mobile laboratory. To achieve the objective of this investigation a total of 4 vapor samples were collected from 4 locations at the site. Sampling depths, vacuum readings, purge volume and sampling volumes are given on the analytical results page.

Vapor sampling was performed by hydraulically pushing soil gas probes to a depth of 5-feet feet below ground surface (bgs). One-quarter inch Nylaflo tubing was installed at depth in a one-foot sand pack. Hydrated bentonite filled the hole from the top of the sand pack to the surface. An electric rotary hammer drill was used to drill a 1.0-inch diameter hole through the overlying surface to allow probe placement when required. The same electric hammer drill was used to push probes in areas of resistance during placement.

At each sampling location an electric vacuum pump set to draw 0.2 liters per minute (L/min) of soil vapor was attached to the probe and purged prior to sample collection. Vapor samples were obtained in SGE gas-tight syringes by drawing the sample through a luer-lock connection which connects the sampling probe and the vacuum pump. Samples were immediately injected into the gas chromatograph/purge and trap after collection. New tubing was used at each sampling point to prevent cross contamination.



All analyses were performed on a laboratory grade Hewlett Packard model 5890 Series II gas chromatograph equipped with a Hewlett Packard model 5971 Mass Spectra Detector and Tekmar LSC 2000 Purge and Trap. An SGE capillary column using helium as the carrier gas was used to perform all analysis. All results were collected on a personal computer utilizing Hewlett Packard's 5971 MS and chromatographic data collection and handling system.

#### 4.3.1 Quality Assurance

##### *5-Point Calibration*

The initial five point calibration consisted of 20, 50, 100, 200 and 500 µl injections of the calibration standard. A calibration factor on each analyte was generated using a best fit line method using the HP data system. If the r2 factor generated from this line was not greater than 0.990, an additional five point calibration would have been performed. Method reporting limits were calculated to be 0.01-1.0 micrograms per Liter (µg/L) for the individual compounds. A daily calibration check and end of run calibration check was performed using a pre-mixed standard supplied by Scotty Analyzed Gases. The standard contained common halogenated solvents and aromatic hydrocarbons (see Table). The individual compound concentrations in the standards ranged between 0.025 nanograms per microliter (ng/µl) and 0.25 ng/µl.

Dichlorodifluoromethane	Carbon Tetrachloride	Chloroethane
Trichlorofluoromethane	1,2-Dichloroethane	Benzene
1,1-Dichloroethene	Trichloroethene	Toluene
Methylene Chloride	1,1,2-Trichloroethane	Ethylbenzene
trans-1,2-Dichloroethene	Tetrachloroethene	m-/p-Xylene
1,1-Dichloroethane	Chloroform	o-Xylene
cis-1,2-Dichloroethene	1,1,1,2-Tetrachloroethane	Vinyl Chloride
1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	Freon 113
4-Methyl-2-Pentanone	Cyclohexane	Acetone
Chlorobenzene	2-Butanone	Isobutane

##### *Sample Replicates*

A replicate analysis (duplicate) was run to evaluate the reproducibility of the sampling system and instrument. The difference between samples did not vary more than 20%.

##### *Equipment Blanks*

Blanks were run at the beginning of each workday and after calibrations. The blanks were collected using an ambient air sample. These blanks checked the septum, syringe, GC column, GC detector and the ambient air. Contamination was not found in any of the blanks analyzed during this investigation. Blank results are given along with the sample results.

##### *Tracer Gas Leak Test*

A tracer gas was applied to the soil gas probes at each point of connection in which ambient air could enter the sampling system. These points include the top of the sampling probe where the tubing meets the probe connection and the surface bentonite seals. Isobutane was used as the tracer gas. No Isobutane was found in any of the samples collected.

*Purge Volume*

The standard purge volume of three volumes was purged in accordance with the July 2015 DTSC/RWQCB Advisory for Active Soil Gas Investigations.

*Shut-in Test*

A shut-in test was conducted prior to purging or sampling each location to check for leaks in the above-ground sampling system. The system was evaluated to a minimum measured vacuum of 100 inches of water. The vacuum gauge was calibrated and sensitive enough to indicate a water pressure change of at least 0.5 inches.

## 5.0 DISCUSSION OF RESULTS

### 5.1 SITE HYDROGEOLOGIC CONDITIONS

The soil material encountered throughout the borings was generally silt (surface to 5 feet bgs). The color of the soil ranged from medium brown to dark brown; and the consistency of the soil was moist.

### 5.2 REGULATORY AGENCY GUIDANCE

#### *Department of Toxic Substances Control Attenuation Factor and Regional Screening Levels*

Regional Screening Levels (RSLs) [formerly Preliminary Remediation Goals (PRGs)] are generic, risk-based chemical concentrations developed by the EPA Region 9 for use in initial screening-level evaluations. RSLs combine human health toxicity values with standard exposure factors to estimate contaminant concentrations that are considered to be health protective of human exposures over a lifetime through direct-contact exposure pathways (e.g., via inhalation and/or ingestion of and/or dermal contact with impacted soil and/or indoor air). RSLs are not legally enforceable standards, but rather are considered guidelines to evaluate if potential risks associated with encountered chemical impacts may warrant further evaluation.

The DTSC Office of Human and Ecological Risk (HERO) developed California-Modified RSLs based on a review of 1) the differences in methodology between Preliminary Remediation Goals (PRGs) and RSLs 2) RSL concentrations, and 3) recent toxicity values.

While soil gas detections are not immediately comparable to the indoor air quality guidelines within the RSLs, the DTSC issued recommended default attenuation factors of 0.05 (sub-slab sampling locations) and 0.002/0.001 (residential/commercial contaminant source sampling locations) for sites where the attenuation factor for the building slab is unknown or cannot be determined in the October 2011 document Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air. With the subsurface contaminant concentrations and default attenuation factors, the associated contaminant concentrations in indoor air can be estimated as Calculated Residential and Commercial/Industrial Soil Gas Screening Levels (SGSLs).

### 5.3 ANALYTICAL RESULTS

#### 5.3.1 SOIL GAS CHEMICAL

In accordance with the current laboratory results for soil gas samples, concentrations of tetrachloroethene (PCE) were found to be within a range between 0.11 µg/L and 0.15 µg/L; concentration of ethylbenzene were found a 0.58 µg/L; concentrations of m/p-xylene were found to be within a range between 1.23 µg/L and 4.45 µg/L; and concentrations of o-xylene were found to be within a range between 1.11 µg/L and 2.01 µg/L, respectively. None of the other compounds were detected above the listed reporting limits. The results of laboratory analyses are presented in Table 1. A copy of the laboratory analytical report is included in Appendix A.

EPA Method	VOCs via 8260B						
	Unit (µg/m <sup>3</sup> )						
Constituent	Residential SGSL <sup>(1)</sup>	Industrial SGSL <sup>(1)</sup>	SV-1	SV-2	SV-3	SV-4	SV-4 Dup
Tetrachloroethene (PCE)	240	2,100	150	ND	110	ND	ND

EPA Method	VOCs via 8260B						
Unit	$(\mu\text{g}/\text{m}^3)$						
Constituent	Residential SGSL <sup>(1)</sup>	Industrial SGSL <sup>(1)</sup>	SV-1	SV-2	SV-3	SV-4	SV-4 Dup
Ethylbenzene	550	4,900	580	ND	110	ND	ND
m/p-xylene	50,000	440,000	4,450	1,230	ND	2,350	2,280
o-xylene	50,000	440,000	2,010	ND	ND	1,110	1,110

Notes:

<sup>(1)</sup> Calculated soil gas screening levels (SGSLs) for soil gas concentrations were derived by dividing the June 2016 Department of Toxic Substances Control (DTSC) or May 2016 United States Environmental Protection Agency (EPA) Regional Screening Level (RSL) for each compound with an attenuation factor of 0.05 for sub-slab samples or with an attenuation factor of 0.002 for residential settings and 0.001 for commercial/industrial settings for soil gas samples deeper than sub-slab samples. DTSC RSLs are provided in the June 2016 DTSC Human and Ecological Risk Office (HERO) Human Health Risk Assessment (HHRA) Note 3. Where DTSC RSLs were not available, EPA Region 9 RSLs were utilized.

VOCs = volatile organic compounds

EPA = United States Environmental Protection Agency

mg/m<sup>3</sup> = micrograms per cubic meter

ND = below listed reporting limit.

The analytical result for soil gas sample for PCE, ethylbenzene, m/p-xylene, and o-xylene was lower than the soil gas screening levels (SGSLs) for commercial/industrial scenario as shown in the table "California DTSC Human and Ecological Risk Office (HERO) Human Health Risk Assessment (HHRA) Note 3, Table 3, dated June, 2016, and United State Environmental Protection Agency Region IX "Regional Screening Levels (RSLs)" June 2017".

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

### 6.1 CONCLUSIONS

The site assessment and previous investigations have led to the following conclusions, which are subject to the standard limitations discussed in Section 7.0:

- In accordance with the current laboratory results for soil gas samples, concentrations of tetrachloroethene (PCE) were found to be within a range between 0.11 µg/L and 0.15 µg/L; concentration of ethylbenzene were found a 0.58 µg/L; concentrations of m/p-xylene were found to be within a range between 1.23 µg/L and 4.45 µg/L; and concentrations of o-xylene were found to be within a range between 1.11 µg/L and 2.01 µg/L, respectively. None of the other compounds were detected above the listed reporting limits.
- The analytical result for soil gas sample for PCE, ethylbenzene, m/p-xylene, and o-xylene was lower than the soil gas screening levels (SGSLs) for commercial/industrial scenario as shown in the table "California DTSC Human and Ecological Risk Office (HERO) Human Health Risk Assessment (HHRA) Note 3, Table 3, dated June, 2016, and United State Environmental Protection Agency Region IX "Regional Screening Levels (RSLs)" June 2017".

### 6.2 RECOMMENDATIONS

The results of this investigation indicated that the former dry cleaners site operations has not resulted in a threat to human health or groundwater beneath the Site. Therefore, WEECO does not recommend any further action regarding the soil contaminant concentrations based on the results of current environmental site assessments.

## 7.0 STANDARD LIMITATIONS

WEECO has prepared this report for the exclusive use of *Open Bank* as it pertains to the former dry cleaners site, located at **3441 & 3441½ W. 8<sup>th</sup> Street, Los Angeles, California**. WEECO's investigation has been performed with the degree of skill generally exercised by practicing engineers and professional civil engineer in the environmental field. WEECO makes no other warranty, either expressed or implied, concerning the conclusions and professional advice, which is contained within the body of this report. *Any use of or reliance on this report by a third party shall be at such a party's sole risk.*

Inherent in most projects performed in a heterogeneous subsurface environment, excavation or continuing assessments may reveal findings that are different than those presented herein. This facet of the environmental profession should be considered when formulating professional opinions on the limited data collected on these projects.

The information presented in this report is valid as of the date our exploration was performed. Site conditions may alter with time; consequently, the findings presented herein are subject to change.

This report has been issued with the clear understanding that it is the responsibility of the owner, or their representative, to make appropriate notifications to regulatory agencies. It is specifically not the responsibility of WEECO to conduct appropriate notifications as specified by current county and state regulations.

WEECO can offer no assurances and assumes no responsibility for site conditions or activities that were outside the scope of the inquiry requested by *Open Bank* as outlined in this document. It should be understood by *Open Bank* that WEECO has relied on the accuracy of documents, oral information, and other material and information provided by *Open Bank* and other associated parties. It is recognized that regulatory requirements may change, including the revision of accepted action levels, which could necessitate a review of the discussion, findings, recommendations or conclusions of this report. Any subsequent modification, revision or verification of this report must be provided in writing by WEECO.

## TABLES

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**TABLE 1:**  
**Summary of Laboratory Results for Soil Gas Samples**

**(unit: µg/L)**

Constituents	SV-1	SV-2	SV-3	SV-4	SV-4 Dup
Dichlorofluoromethane	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND
Trichlorofluoromethane	ND	ND	ND	ND	ND
Freon 113	ND	ND	ND	ND	ND
Methylene Chloride	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND
Carbon Tetrachloride	ND	ND	ND	ND	ND
1,2-Dichloroethane	ND	ND	ND	ND	ND
Trichloroethene (TCE)	<b>0.15</b>	ND	<b>0.11</b>	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND
Tetrachloroethene (PCE)	ND	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND
Vinyl Chloride	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND
Trans-1,2-Dichloroethene	ND	ND	ND	ND	ND
2-Butanone (MEK)	ND	ND	ND	ND	ND
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND
Cyclohexane	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND
4-Methyl-2-Pentanone	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND
Ethylbenzene	<b>0.58</b>	ND	ND	ND	ND
m/p-Xylene	<b>4.45</b>	<b>1.23</b>	ND	<b>2.35</b>	<b>2.28</b>
o-Xylene	<b>2.01</b>	ND	ND	<b>1.11</b>	<b>1.11</b>
Isobutane	ND	ND	ND	ND	ND

**Note:**

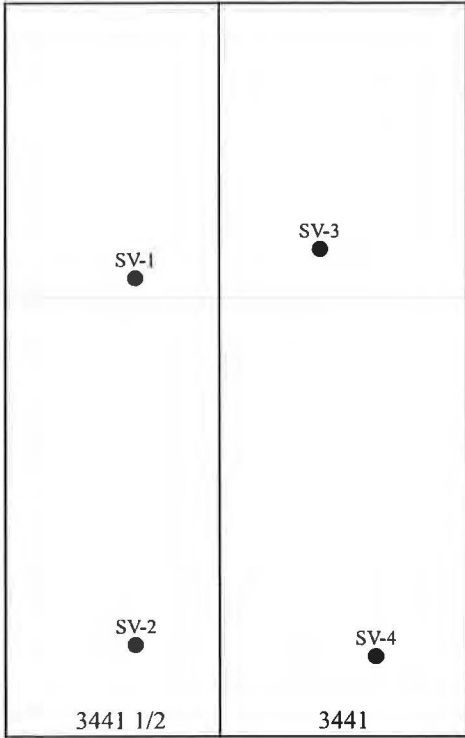
ND = not detected (below laboratory reporting limit)



## FIGURES

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*W. 8th St.*



Approximate Scale

**Legend**

- SV-1 - Soil Vapor Sample Number
- - Soil Vapor Sample Location

**Optimal Technology**  
 1667 Cross Bridge Place  
 Thousand Oaks, CA 91362  
 Toll-free (877) SOIL GAS  
 Tel: (818) 734-6230 \* Fax: (818) 734-6235

DATE: January 29, 2018

COMPANY:  
 WEECO

APPROXIMATE SCALE: 1" = 10'

TITLE: Soil Vapor Sampling Location Map  
 3441 W. 8th St., Los Angeles, CA

FIGURE

**1**

**APPENDIX A**

Optimal Technology Report



**OPTIMAL TECHNOLOGY**  
Specializing in Environmental Field Services

January 30, 2018

Mr. James Yoon  
WEECO  
12610 Westminster Avenue, Unit C  
Santa Ana, CA 92706

Dear Mr. Yoon:

This letter presents the results of the soil vapor investigation conducted by Optimal Technology (Optimal), for WEECO on January 29, 2018. The study was performed at 3441 W. 8th St., Los Angeles, California.

Optimal was contracted to perform a soil vapor survey at this site to screen for possible chlorinated solvents and aromatic hydrocarbons. The primary objective of this soil vapor investigation was to determine if soil vapor contamination is present in the subsurface soil.

**Gas Sampling Method**

Gas sampling was performed by hydraulically pushing soil gas probes to a depth of 5.0 feet below ground surface (bgs). An electric rotary hammer drill was used to drill a 1.0-inch diameter hole through the overlying surface to allow probe placement when required. The same electric hammer drill was used to push probes in areas of resistance during placement.

At each sampling location, an electric vacuum pump set to draw 0.2 liters per minute (L/min) of soil vapor was attached to the probe and purged prior to sample collection. All vapor samples were collected in gas-tight syringes. Samples were immediately injected into the gas chromatograph/purge and trap after collection. New tubing was used at each sampling point to prevent cross contamination.

All analyses were performed on a laboratory grade Hewlett Packard model 5890 Series II gas chromatograph equipped with a Hewlett Packard model 5971 Mass Spectra Detector and Tekmar LSC 2000 Purge and Trap. An SGE capillary column using helium as the carrier gas was used to perform all analysis. All results were collected on a personal computer utilizing Hewlett Packard's 5971 MS and chromatographic data collection and handling system.

## Quality Assurance

### *5-Point Calibration*

The initial five-point calibration consisted of 20, 50, 100, 200 and 500 ul injections of the calibration standard. A calibration factor on each analyte was generated using a best fit line method using the HP data system. If the  $r^2$  factor generated from this line was not greater than 0.990, an additional five-point calibration would have been performed. Method reporting limits were calculated to be 0.004-1.0 micrograms per Liter (ug/L) for the individual compounds.

A daily calibration check was performed using a pre-mixed standard supplied by Scotty Analyzed Gases. The standard contained common halogenated solvents and aromatic hydrocarbons (see Table 1). The individual compound concentrations in the standards ranged between 0.025 nanograms per microliter (ng/ul) and 0.25 ng/ul.

**TABLE 1**

Dichlorodifluoromethane	Carbon Tetrachloride	Chloroethane
Trichlorofluoromethane	1,2-Dichloroethane	Benzene
1,1-Dichloroethene	Trichloroethene	Toluene
Methylene Chloride	1,1,2-Trichloroethane	Ethylbenzene
trans-1,2-Dichloroethene	Tetrachloroethene	m-/p-Xylene
1,1-Dichloroethane	Chloroform	o-Xylene
cis-1,2-Dichloroethene	1,1,1,2-Tetrachloroethane	Vinyl Chloride
1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	Freon 113
4-Methyl-2-Pentanone	Cyclohexane	Acetone
Chlorobenzene	2-Butanone	Isobutane

### *Sample Replicates*

A replicate analysis (duplicate) was run to evaluate the reproducibility of the sampling system and instrument. The difference between samples did not vary more than 20%.

### *Equipment Blanks*

Blanks were run at the beginning of each workday and after calibrations. The blanks were collected using an ambient air sample. These blanks checked the septum, syringe, GC column, GC detector and the ambient air. Contamination was not found in any of the blanks analyzed during this investigation. Blank results are given along with the sample results.

### *Tracer Gas Leak Test*

A tracer gas was applied to the soil gas probes at each point of connection in which ambient air could enter the sampling system. These points include the top of the sampling probe where the tubing meets the probe connection and the surface bentonite seals. Isobutane was used as the tracer gas. No Isobutane was found in any of the samples collected.

### *Purge Volume*

The standard purge volume of three volumes was purged in accordance with the July 2015 DTSC/RWQCB Advisory for Active Soil Gas Investigations.

### *Shut-in Test*

A shut-in test was conducted prior to purging or sampling each location to check for leaks in the above-ground sampling system. The system was evaluated to a minimum measured vacuum of 100 inches of water. The vacuum gauge was calibrated and sensitive enough to indicate a water pressure change of at least 0.5 inches.

### **Scope of Work**

To achieve the objective of this investigation a total of 5 vapor samples were collected from 4 locations at the site. Sampling depths, vacuum readings, purge volume and sampling volumes are given on the analytical results page. All the collected vapor samples were analyzed on-site using Optimal's mobile laboratory.

### **Subsurface Conditions**

Subsurface soil conditions at this site offered sampling flows at 0" water vacuum. Depth to groundwater was unknown at the time of the investigation.

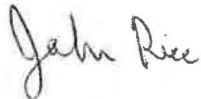
### **Results**

During this vapor investigation, two samples contained levels of Tetrachloroethene (PCE) ranging from 0.11 ug/L to 0.15 ug/L. Four samples contained levels of m/p-Xylene ranging from 1.23 ug/L to 4.45 ug/L. Three samples contained levels of o-Xylene ranging from 1.11 ug/L to 2.01 ug/L. One sample contained 0.58 ug/L of Ethylbenzene. None of the other compounds listed in Table 1 above were detected above the listed reporting limits. A complete table of analytical results is included with this report.

### **Disclaimer**

All conclusions presented in this letter are based solely on the information collected by the soil vapor survey conducted by Optimal Technology. Soil vapor testing is only a subsurface screening tool and does not represent actual contaminant concentrations in either the soil and/or groundwater. We enjoyed working with you on this project and look forward to future projects. If you have any questions please contact me at (877) 764-5427.

Sincerely,



John Rice  
Project Manager

