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## LIMITED PHASE II SUBSURFACE INVESTIGATION REPORT



20621 LAKE FOREST DRIVE, LAKE FOREST, CALIFORNIA

Prepared For:

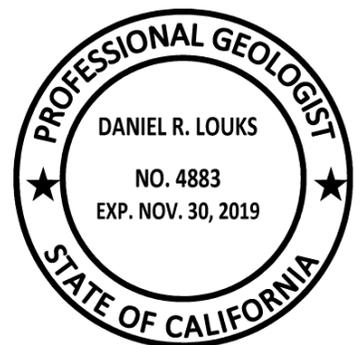
Toll Brothers  
725 Town and Country Road, Suite 200  
Orange, California 92868

Hillmann Project Number C3-7330

November 26, 2018

Written By:  
Hillmann Consulting, LLC

Dan Louks  
Professional Geologist 4883



---

**Your Property. Our Priority.**

1745 W. Orangewood Avenue, Suite 110, Orange, CA 92868  
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[www.HillmannConsulting.com](http://www.HillmannConsulting.com)



November 26, 2018

Mr. Ilan Feingold  
Toll Brothers  
725 Town and Country Road, Suite 200  
Orange, California 92868

**RE: Limited Phase II Subsurface Investigation Report**  
20621 Lake Forest Drive  
Lake Forest, California  
Hillmann Project Number: C3-7330

Dear Mr. Feingold:

Hillmann Consulting, LLC, is pleased to provide this Limited Phase II Subsurface Investigation Report prepared for the above referenced property.

This report is for the exclusive use of the entities named on the front cover, its affiliates, designates and assignees, rating agencies, prospective bond holders and bond holders, and no other party shall have any right to rely on any service provided by Hillmann Consulting, LLC, without prior written consent.

We appreciate the opportunity to provide environmental due diligence services. If you have any questions concerning this report, or if we can assist you in any other matter, please contact the Project Manager at 714-634-9500.

Very Truly Yours,  
Hillmann Consulting, LLC

Brandon Clements  
Partner; Western Regional Director

---

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## 1.0 INTRODUCTION / BACKGROUND

Hillmann Consulting, LLC (Hillmann) conducted a Limited Phase II Subsurface Investigation at 20621 Lake Forest Drive, Lake Forest, California (**Figure 1**). The subject Property is located between Lake Forest Drive and Bake Parkway, just southwest of Rancho Parkway, in a mixed use commercial-residential section of Lake Forest. The Property occupies approximately 122 acres and is being considered for residential development.

In August 2018, Hillmann completed a Phase I Environmental Site Assessment for the Property. The Property has historically been used for agricultural purposes and is currently operated as a nursery. Records indicate there had been an underground tank located in the southeast portion of the Property in the maintenance area, and there are no records of its removal. Based on these results, Hillmann recommended conducting a geophysical survey to investigate this portion of the site for evidence of existing or former USTs and conducting a preliminary subsurface investigation to address possible vapor intrusion concerns. These results are presented in Hillmann's "*Phase I Environmental Site Assessment Report*" dated July 13, 2018 and updated September 10, 2018.

In November 2018, Hillmann completed a Limited Phase II Subsurface Investigation at the Property that included conducting a geophysical study to identify potential UST locations, followed by soil gas sampling to identify potential contamination from targeted locations in the maintenance area. The current investigation is an independent assessment of the site that was constrained by time and cost factors as part of a self-directed effort. The objective of this work was to determine the current representative subsurface conditions in accessible areas of the site.

The investigation featured soil gas sampling which was considered very important in determining possible vapor intrusion impacts. Results from soil gas sampling indicated no detectable levels of VOC in any of the soil gas samples, indicating no significant vapor intrusion threat from these areas.

## 2.0 GEOLOGY/HYDROGEOLOGY

Based on the drilling logs, shallow soils beneath the site consist primarily of silty sand and silt from near surface to 12 feet below grade, the deepest interval explored by drilling in this investigation. Groundwater was not encountered during drilling to 12 feet below grade. Descriptions of the sediments encountered during drilling are presented in the drilling logs (**Appendix C**).

Based on information available on the GeoTracker website, groundwater is present at about 75-100 feet below grade at a site located about 1.6 miles west of the Property (Musick Branch Jail, 13502 Musick Road, Irvine, CA, Global ID-T0605901583).

### **3.0 SITE INVESTIGATION**

On November 13, 2018, Hillmann oversaw a geophysical survey performed by Pacific Coast Locators to locate an existing UST or target the location of a former UST if it had been removed in the past. Results of the ground penetrating radar work identified a rectangular area that indicated it was recently backfilled, suggesting the location of the former UST. Maintenance personnel also confirmed that the UST was removed from that targeted area in the southeast portion of the Site.

On November 14, 2018, Hillmann installed 4 soil gas probes (SG1-SG4) in accessible areas of the maintenance area. Probes SG1 and SG2 were installed in the garage area to 5 feet below grade where tools and equipment was maintained. Probes SG3 and SG4 were installed in the former UST area identified by the geophysical study to total depths of 12 and 8 feet below grade. The probes were installed using hand auger tools. During drilling, the soil column was logged by a California Professional Geologist. The locations of the borings are indicated on **Figure 3**.

The probes consist of plastic micro-porous vapor implants that are approximately 2 inches long with a 0.5-inch outside diameter, connected to 0.25-inch outside diameter nylaflow tubing that extended above the surface. The annulus around the vapor implants was backfilled with approximately 0.5 feet of screen-washed #3 sand. The probes were sealed using bentonite placed immediately above the sand pack to provide a secure borehole seal. The probes were finished with gas-tight fittings at the surface pending vapor purging and sampling.

The soil gas sampling probes were allowed to equilibrate for at least 48 hours before collecting vapor samples. Prior to vapor sampling, shut-in and leak tests were conducted on the probes. The probe head was attached to the sampling train assembly of Nylaflow tubing, valves, and fittings and connected to a purge pump. The pump was used to evacuate the sealed system using an applied vacuum of 100 inches of water column (in. WC). The vacuum on each probe was monitored for 90 seconds with the sampling train system sealed. After the shut-in test was validated, the sampling train was leak tested. Liquid isobutylene was applied around all connections in the sampling train to evaluate whether the system was sealed from ambient air leaks. A detection of 10 times the reporting limit of this compound might suggest that ambient air leakage had occurred.

The purpose of purging is to remove stagnant air from the vapor sampling train to ensure representative samples are obtained. The probes were purged using an adjustable vacuum pump set at 200 mL/minute. During purging, the soil gas was monitored for VOC, oxygen, and carbon dioxide content using a Mini-Rae 2000 multi gas detector to ensure that non-atmospheric formation air was being sampled (**Appendix D**).

After purging three volumes through the system, vapor samples were collected from the probes on November 16, 2018. During sampling, the purge pump was operated at 200 mL/minute, and the vacuum was monitored to ensure it was below 100 in. WC. Vacuum applied below this level helps ensure chemical partitioning from pore water to soil gas and the stress on the air seals are both minimized. The samples were containerized in Tedlar bags which were delivered to the laboratory for analysis. Fresh tubing was used on each sampling train between holes.

The soil gas samples were tested for VOC using EPA Method 8260B by A&R Laboratories of Ontario, California.

### **3.1 Laboratory Results**

Results from soil gas sampling indicated none of the samples had detectable levels of VOC. These results are summarized in **Table 1**. The laboratory report from soil gas sampling is included in **Appendix B**.

## **4.0 CONCLUSIONS AND RECOMMENDATIONS**

The Property has historically been used for agricultural purposes and is currently operated as a nursery. Records indicate there had been an underground tank located in the southeast portion of the Property in the maintenance area, and there are no records of its removal. Based on these results, Hillmann recommended conducting a geophysical survey to investigate this portion of the site for evidence of existing or former USTs and conducting preliminary subsurface investigation to address possible vapor intrusion concerns.

In November 2018, Hillmann installed 4 soil gas probes in accessible locations at the site. Results from soil gas sampling indicated no detectable levels of VOC indicating no significant vapor intrusion threat potential.

Based on these results, we recommended no further sampling at the portion of the site investigated.

## **5.0 LIMITATIONS**

This Subsurface Investigation was performed in accordance with generally and currently accepted engineering practices and principles; however, the procedures and methodologies used in this investigation are not intended to meet all specific regulatory guidelines as this work was completed as a self-directed effort. Although the data in this report is indicative of subsurface conditions in areas investigated, no further conclusions regarding the absence or presence of subsurface contamination in other areas of the site should be construed or inferred other than those expressly stated in this report. The conclusions made are based on information obtained from field observations, independent laboratory analytical results, and from current and relevant Federal, State, regional, and local agencies.

**TABLE 1**  
**Summary of Soil Gas Sampling Results (ug/L)**

Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes	TCE	PCE	Other VOC
Sampled November 16, 2018							
SG1-5	ND<0.05	ND<0.1	ND<0.1	ND<0.2	ND<0.1	ND<0.1	ND
SG2-5	ND<0.05	ND<0.1	ND<0.1	ND<0.2	ND<0.1	ND<0.1	ND
SG3-12	ND<0.05	ND<0.1	ND<0.1	ND<0.2	ND<0.1	ND<0.1	ND
SG4-8	ND<0.05	ND<0.1	ND<0.1	ND<0.2	ND<0.1	ND<0.1	ND
<b>Residential RSL</b>	<b>0.0485*</b>	<b>155*</b>	<b>0.55</b>	<b>50</b>	<b>0.24</b>	<b>0.23*</b>	<b>--</b>
<b>Commercial RSL</b>	<b>0.42*</b>	<b>1,300*</b>	<b>4.9</b>	<b>440</b>	<b>3.0</b>	<b>2.0*</b>	<b>--</b>

*Notes: ND - Not Detected. EPA Regional Screening Levels (RSLs) are human health risk based screening levels used by EPA and DTSC to determine Health Risk in residential and commercial settings. \*-Values modified for California by DTSC HERO Note 3. Screening levels for soil gas calculated using indoor air values and attenuation factors provided by DTSC. Please refer to laboratory report for complete results.*

# FIGURES

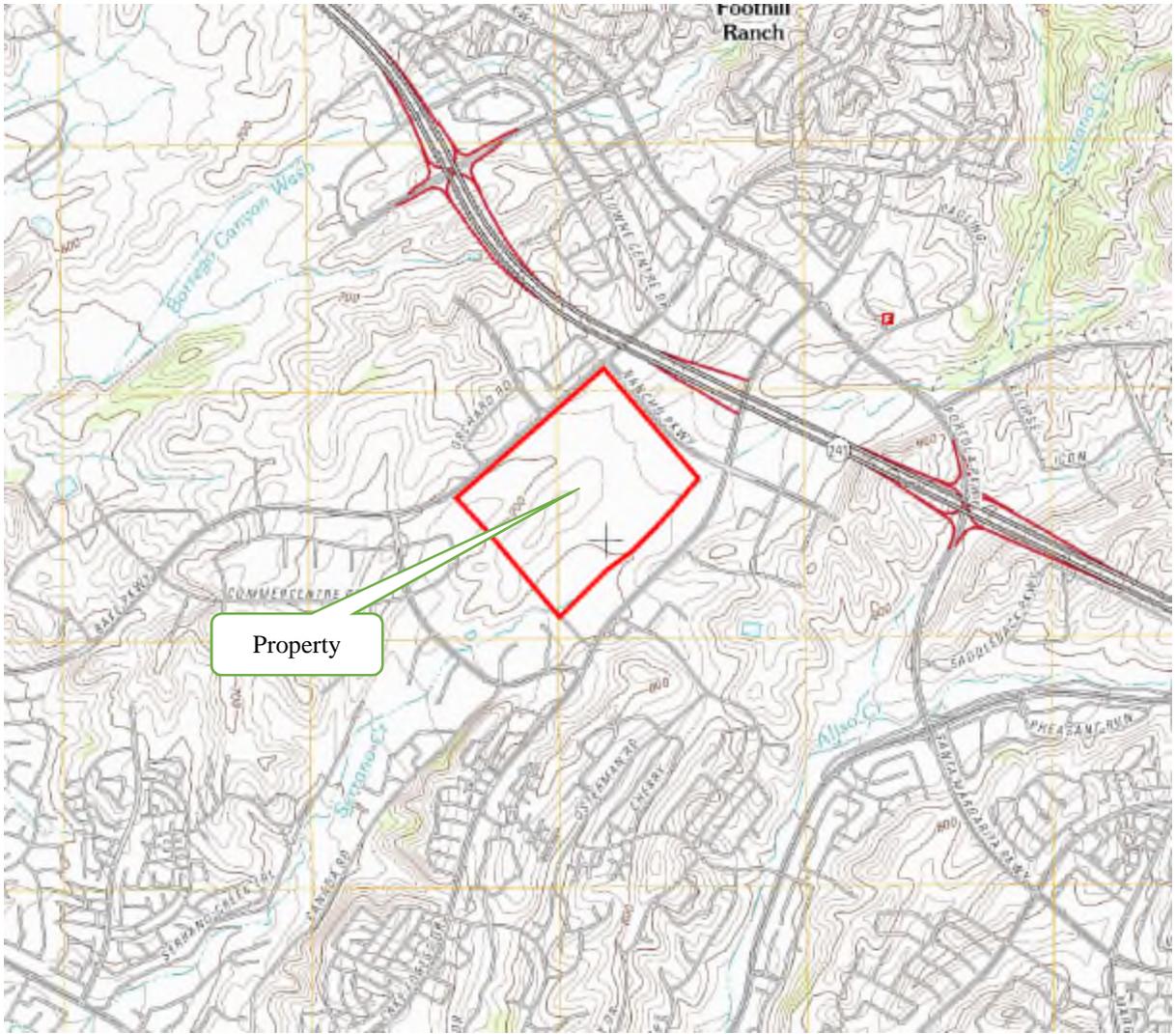


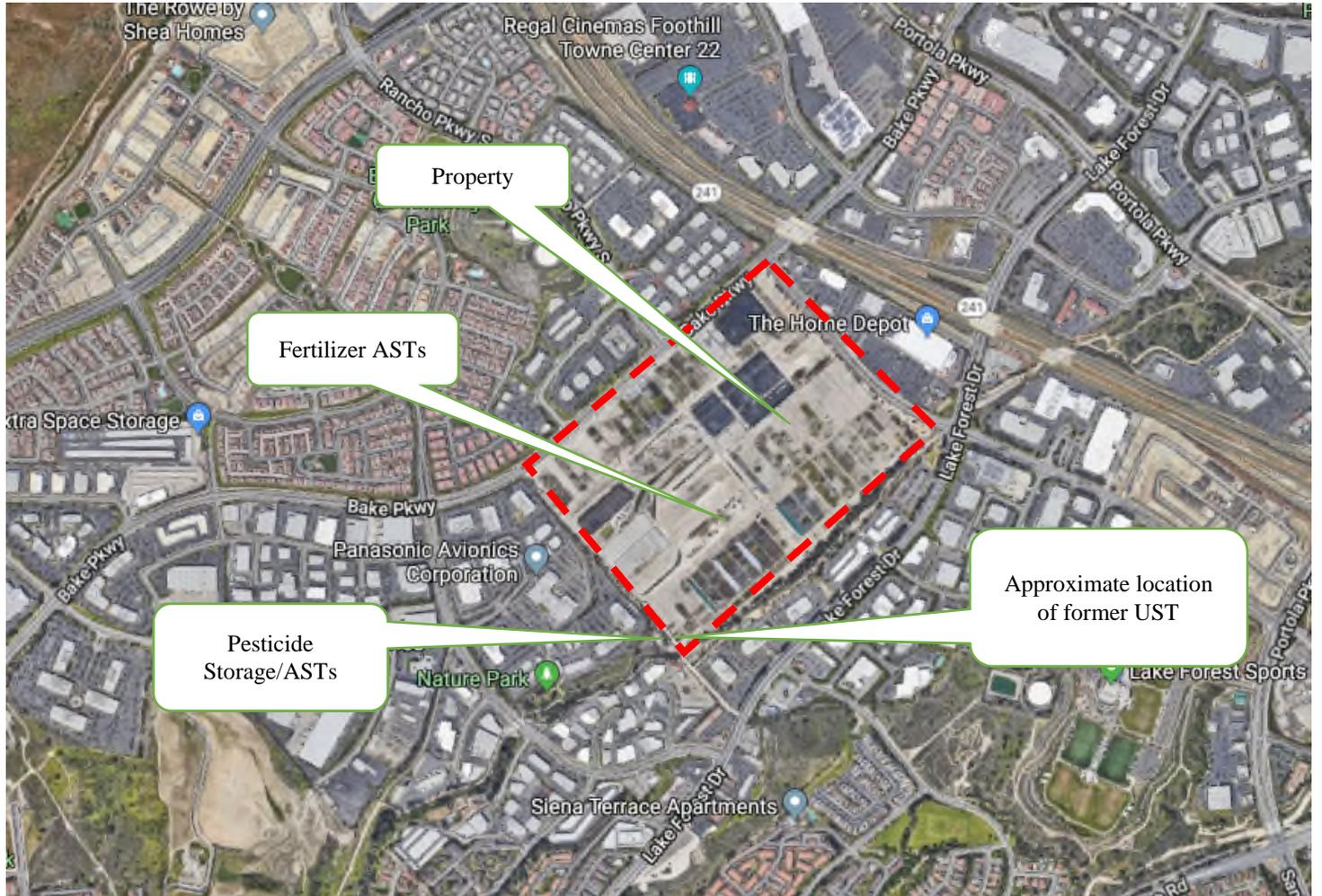
Figure 1: SITE VICINITY MAP

SCALE: (Not to Scale)

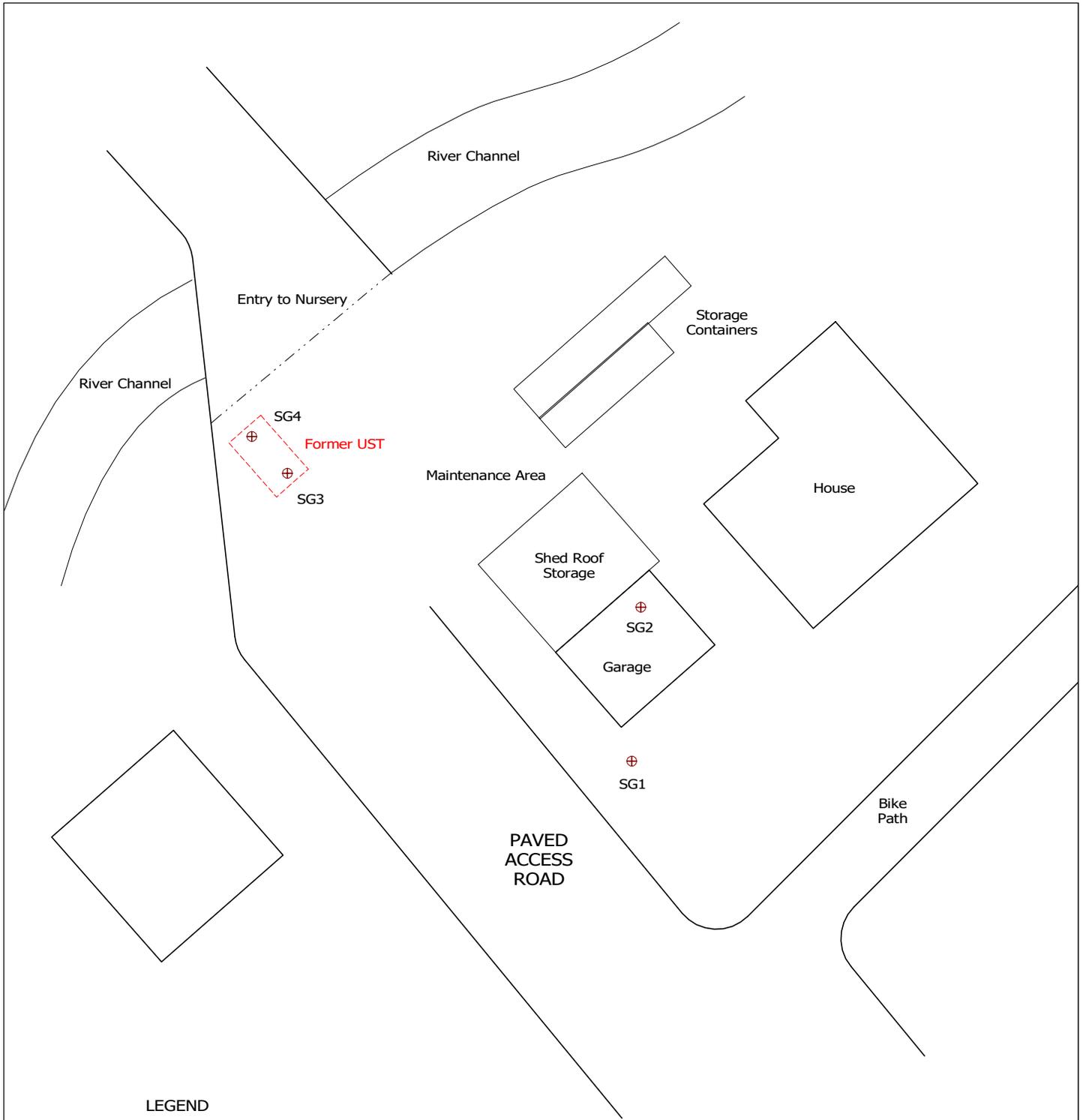


**Project Location:** 20621 Lake Forest Drive  
Lake Forest, CA 92630

**Project No.:** C3-7216



<p>Figure 2: SITE DIAGRAM</p>	<p>SCALE: (Not to Scale)</p>	<p>N ↑</p>
	<p><b>Project Location:</b> 20621 Lake Forest Drive Lake Forest, CA 92630</p> <p><b>Project No.:</b> C3-7216</p>	



LEGEND

⊕ Soil Gas Probes

FIGURE 3  
 MAINTENANCE AREA DETAIL  
 20621 Lake Forest Drive  
 Lake Forest, California

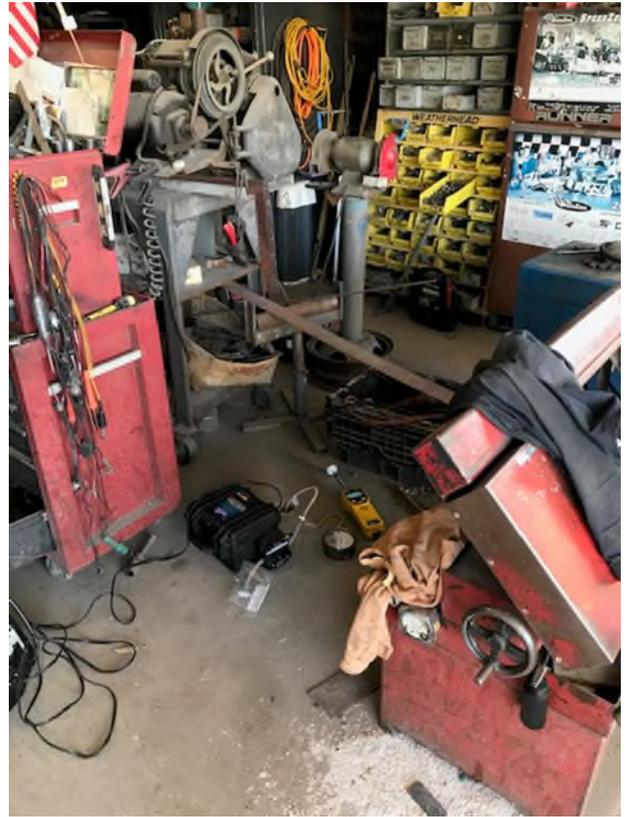


# APPENDIX A

## Site Photos



SG1



SG2



SG3



SG4

# APPENDIX B

## Laboratory Reports



# A & R Laboratories, Inc.

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## CASE NARRATIVE

Authorized Signature Name / Title (print)

Ken Zheng, President

Signature / Date

Ken Zheng, President  
11/18/2018 8:14:09

Laboratory Job No. (Certificate of Analysis No.)

1811-00149

Project Name / No.

20621 LAKE FOREST DR., LAKE FOREST

Dates Sampled (from/to)

11/16/18 To 11/16/18

Dates Received (from/to)

11/16/18 To 11/16/18

Dates Reported (from/to)

11/18/18 To 11/18/2018

Chains of Custody Received

Yes

Comments:

### Subcontracting

Organic Analyses

No analyses sub-contracted

### Sample Condition(s)

All samples intact

### Positive Results (Organic Compounds)

None



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## CERTIFICATE OF ANALYSIS

1811-00149

HILLMANN CONSULTING  
DAN LOUKS  
1745 ORANGEWOOD AVE., #110  
ORANGE, CA 92868

Date Reported 11/18/18  
Date Received 11/16/18  
Invoice No. 84029  
Cust # G073  
Permit Number  
Customer P.O.

**Project: 20621 LAKE FOREST DR., LAKE FOREST**

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 001 <b>SG1-5</b>							Date & Time Sampled: 11/16/18 @ 10:30	
Sample Matrix: <b>Soil Vapor</b>								
[VOCs by GCMS]								
Acetone	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
t-Amyl Methyl Ether (TAME)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Benzene	<0.050		µg/L	EPA 8260B	1.0	0.050	11/16/18	AL
Bromobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Bromochloromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Bromodichloromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Bromoform	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Bromomethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
t-Butanol (TBA)	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
2-Butanone (MEK)	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
n-Butylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
sec-Butylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
tert-Butylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Carbon Disulfide	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
Carbon Tetrachloride	<0.050		µg/L	EPA 8260B	1.0	0.050	11/16/18	AL
Chlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Chloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Chloroform	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Chloromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
2-Chlorotoluene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
4-Chlorotoluene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Dibromochloromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dibromoethane (EDB)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dibromo-3-Chloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Dibromomethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,3-Dichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,4-Dichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Dichlorodifluoromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1-Dichloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dichloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL

The data and information on this, and other accompanying documents, represent only the sample(s) analyzed and is rendered upon condition that it is not to be reproduced, wholly or in part, for advertising or other purposes without approval from the laboratory.

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## CERTIFICATE OF ANALYSIS

1811-00149

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Cust # G073  
Permit Number  
Customer P.O.

Project: 20621 LAKE FOREST DR., LAKE FOREST

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 001 <b>SG1-5</b>							Date & Time Sampled: 11/16/18 @ 10:30	
Sample Matrix: <b>Soil Vapor</b>								
.....continued								
1,1-Dichloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
cis-1,2-Dichloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
trans-1,2-Dichloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dichloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,3-Dichloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
2,2-Dichloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1-Dichloropropene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
cis-1,3-Dichloropropene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
trans-1,3-Dichloropropene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Diisopropyl Ether (DiPE)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Ethylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Ethyl-t-Butyl Ether (EtBE)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Hexachlorobutadiene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
2-Hexanone	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
Isopropylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
4-Isopropyltoluene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Methylene Chloride	<0.1		µg/L	EPA 8260B	1.0	0.1	11/16/18	AL
4-Methyl-2-Pentanone (MIBK)	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
Methyl-t-butyl Ether (MtBE)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Naphthalene	<0.050		µg/L	EPA 8260B	1.0	0.050	11/16/18	AL
n-Propylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Styrene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1,1,2-Tetrachloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1,1,2,2-Tetrachloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Tetrachloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Toluene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2,3-Trichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2,4-Trichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1,1-Trichloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1,2-Trichloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Trichloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL

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Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 001 <b>SG1-5</b>							Date & Time Sampled: 11/16/18 @ 10:30	
Sample Matrix: <b>Soil Vapor</b>								
.....continued								
1,2,3-Trichloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Trichlorofluoromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Trichlorotrifluoroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2,4-Trimethylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,3,5-Trimethylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Vinyl Chloride	<0.050		µg/L	EPA 8260B	1.0	0.050	11/16/18	AL
m,p-Xylenes	<0.20		µg/L	EPA 8260B	1.0	0.20	11/16/18	AL
o-Xylene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
[VOC Vapor Sampling Tracer]								
Isopropanol (IPA)	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
[VOC Surrogates]								
Dibromofluoromethane	103		%REC	EPA 8260B		70-130	11/16/18	AL
Toluene-D8	102		%REC	EPA 8260B		70-130	11/16/18	AL
Bromofluorobenzene	100		%REC	EPA 8260B		70-130	11/16/18	AL
Sample: 002 <b>SG2-5</b>							Date & Time Sampled: 11/16/18 @ 10:40	
Sample Matrix: <b>Soil Vapor</b>								
[VOCs by GCMS]								
Acetone	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
t-Amyl Methyl Ether (TAME)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Benzene	<0.050		µg/L	EPA 8260B	1.0	0.050	11/16/18	AL
Bromobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Bromochloromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Bromodichloromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Bromoform	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Bromomethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
t-Butanol (TBA)	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
2-Butanone (MEK)	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
n-Butylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
sec-Butylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
tert-Butylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL

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## CERTIFICATE OF ANALYSIS

1811-00149

HILLMANN CONSULTING  
DAN LOUKS  
1745 ORANGEWOOD AVE., #110  
ORANGE, CA 92868

Date Reported 11/18/18  
Date Received 11/16/18  
Invoice No. 84029  
Cust # G073  
Permit Number  
Customer P.O.

**Project: 20621 LAKE FOREST DR., LAKE FOREST**

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 002 <b>SG2-5</b>							Date & Time Sampled: 11/16/18 @ 10:40	
Sample Matrix: <b>Soil Vapor</b>								
.....continued								
Carbon Disulfide	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
Carbon Tetrachloride	<0.050		µg/L	EPA 8260B	1.0	0.050	11/16/18	AL
Chlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Chloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Chloroform	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Chloromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
2-Chlorotoluene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
4-Chlorotoluene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Dibromochloromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dibromoethane (EDB)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dibromo-3-Chloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Dibromomethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,3-Dichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,4-Dichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Dichlorodifluoromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1-Dichloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dichloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1-Dichloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
cis-1,2-Dichloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
trans-1,2-Dichloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dichloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,3-Dichloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
2,2-Dichloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1-Dichloropropene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
cis-1,3-Dichloropropene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
trans-1,3-Dichloropropene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Diisopropyl Ether (DiPE)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Ethylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Ethyl-t-Butyl Ether (EtBE)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Hexachlorobutadiene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL

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Cust # G073  
Permit Number  
Customer P.O.

Project: 20621 LAKE FOREST DR., LAKE FOREST

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 002 <b>SG2-5</b>							Date & Time Sampled: 11/16/18 @ 10:40	
Sample Matrix: <b>Soil Vapor</b>								
.....continued								
2-Hexanone	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
Isopropylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
4-Isopropyltoluene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Methylene Chloride	<0.1		µg/L	EPA 8260B	1.0	0.1	11/16/18	AL
4-Methyl-2-Pentanone (MIBK)	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
Methyl-t-butyl Ether (MtBE)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Naphthalene	<0.050		µg/L	EPA 8260B	1.0	0.050	11/16/18	AL
n-Propylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Styrene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1,1,2-Tetrachloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1,2,2-Tetrachloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Tetrachloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Toluene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2,3-Trichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2,4-Trichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1,1-Trichloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1,2-Trichloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Trichloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2,3-Trichloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Trichlorofluoromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Trichlorotrifluoroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2,4-Trimethylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,3,5-Trimethylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Vinyl Chloride	<0.050		µg/L	EPA 8260B	1.0	0.050	11/16/18	AL
m,p-Xylenes	<0.20		µg/L	EPA 8260B	1.0	0.20	11/16/18	AL
o-Xylene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
[VOC Vapor Sampling Tracer]								
Isopropanol (IPA)	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
[VOC Surrogates]								
Dibromofluoromethane	103		%REC	EPA 8260B		70-130	11/16/18	AL
Toluene-D8	100		%REC	EPA 8260B		70-130	11/16/18	AL

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Customer P.O.

Project: 20621 LAKE FOREST DR., LAKE FOREST

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 002 <b>SG2-5</b> Sample Matrix: <b>Soil Vapor</b> .....continued							Date & Time Sampled: 11/16/18 @ 10:40	
Bromofluorobenzene	99		%REC	EPA 8260B		70-130	11/16/18	AL
Sample: 003 <b>SG3-12</b> Sample Matrix: <b>Soil Vapor</b>							Date & Time Sampled: 11/16/18 @ 10:50	
[TPH Gasoline by GCMS ]								
C4-C12	<50		µg/L	LUFT GCMS	5.0	50	11/16/18	AL
[VOCs by GCMS]								
Acetone	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
t-Amyl Methyl Ether (TAME)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Benzene	<0.050		µg/L	EPA 8260B	1.0	0.050	11/16/18	AL
Bromobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Bromochloromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Bromodichloromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Bromoform	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Bromomethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
t-Butanol (TBA)	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
2-Butanone (MEK)	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
n-Butylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
sec-Butylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
tert-Butylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Carbon Disulfide	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
Carbon Tetrachloride	<0.050		µg/L	EPA 8260B	1.0	0.050	11/16/18	AL
Chlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Chloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Chloroform	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Chloromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
2-Chlorotoluene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
4-Chlorotoluene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Dibromochloromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dibromoethane (EDB)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dibromo-3-Chloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL

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Date Reported 11/18/18  
Date Received 11/16/18  
Invoice No. 84029  
Cust # G073  
Permit Number  
Customer P.O.

**Project: 20621 LAKE FOREST DR., LAKE FOREST**

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 003 <b>SG3-12</b>							Date & Time Sampled: 11/16/18 @ 10:50	
Sample Matrix: <b>Soil Vapor</b>								
.....continued								
Dibromomethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,3-Dichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,4-Dichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Dichlorodifluoromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1-Dichloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dichloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1-Dichloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
cis-1,2-Dichloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
trans-1,2-Dichloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dichloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,3-Dichloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
2,2-Dichloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1-Dichloropropene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
cis-1,3-Dichloropropene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
trans-1,3-Dichloropropene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Diisopropyl Ether (DIPE)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Ethylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Ethyl-t-Butyl Ether (EtBE)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Hexachlorobutadiene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
2-Hexanone	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
Isopropylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
4-Isopropyltoluene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Methylene Chloride	<0.1		µg/L	EPA 8260B	1.0	0.1	11/16/18	AL
4-Methyl-2-Pentanone (MIBK)	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
Methyl-t-butyl Ether (MtBE)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Naphthalene	<0.050		µg/L	EPA 8260B	1.0	0.050	11/16/18	AL
n-Propylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Styrene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1,1,2-Tetrachloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1,2,2-Tetrachloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL

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Customer P.O.

Project: 20621 LAKE FOREST DR., LAKE FOREST

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 003 <b>SG3-12</b>							Date & Time Sampled: 11/16/18 @ 10:50	
Sample Matrix: <b>Soil Vapor</b>								
.....continued								
Tetrachloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Toluene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2,3-Trichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2,4-Trichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1,1-Trichloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1,2-Trichloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Trichloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2,3-Trichloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Trichlorofluoromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Trichlorotrifluoroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2,4-Trimethylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,3,5-Trimethylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Vinyl Chloride	<0.050		µg/L	EPA 8260B	1.0	0.050	11/16/18	AL
m,p-Xylenes	<0.20		µg/L	EPA 8260B	1.0	0.20	11/16/18	AL
o-Xylene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
[VOC Vapor Sampling Tracer]								
Isopropanol (IPA)	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
[VOC Surrogates]								
Dibromofluoromethane	105		%REC	EPA 8260B		70-130	11/16/18	AL
Toluene-D8	102		%REC	EPA 8260B		70-130	11/16/18	AL
Bromofluorobenzene	97		%REC	EPA 8260B		70-130	11/16/18	AL
Sample: 004 <b>SG4-8</b>							Date & Time Sampled: 11/16/18 @ 11:00	
Sample Matrix: <b>Soil Vapor</b>								
[TPH Gasoline by GCMS ]								
C4-C12	<50		µg/L	LUFT GCMS	5.0	50	11/16/18	AL
[VOCs by GCMS]								
Acetone	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
t-Amyl Methyl Ether (TAME)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Benzene	<0.050		µg/L	EPA 8260B	1.0	0.050	11/16/18	AL
Bromobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL

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## CERTIFICATE OF ANALYSIS

1811-00149

HILLMANN CONSULTING  
DAN LOUKS  
1745 ORANGEWOOD AVE., #110  
ORANGE, CA 92868

Date Reported 11/18/18  
Date Received 11/16/18  
Invoice No. 84029  
Cust # G073  
Permit Number  
Customer P.O.

**Project: 20621 LAKE FOREST DR., LAKE FOREST**

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 004 <b>SG4-8</b>							Date & Time Sampled: 11/16/18 @ 11:00	
Sample Matrix: <b>Soil Vapor</b>								
.....continued								
Bromochloromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Bromodichloromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Bromoform	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Bromomethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
t-Butanol (TBA)	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
2-Butanone (MEK)	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
n-Butylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
sec-Butylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
tert-Butylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Carbon Disulfide	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
Carbon Tetrachloride	<0.050		µg/L	EPA 8260B	1.0	0.050	11/16/18	AL
Chlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Chloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Chloroform	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Chloromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
2-Chlorotoluene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
4-Chlorotoluene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Dibromochloromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dibromoethane (EDB)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dibromo-3-Chloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Dibromomethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,3-Dichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,4-Dichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Dichlorodifluoromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1-Dichloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dichloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1-Dichloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
cis-1,2-Dichloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
trans-1,2-Dichloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2-Dichloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL

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## CERTIFICATE OF ANALYSIS

1811-00149

Date Reported 11/18/18

Date Received 11/16/18

Invoice No. 84029

Cust # G073

Permit Number

Customer P.O.

HILLMANN CONSULTING  
DAN LOUKS  
1745 ORANGEWOOD AVE., #110  
ORANGE, CA 92868

Project: 20621 LAKE FOREST DR., LAKE FOREST

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 004 <b>SG4-8</b>							Date & Time Sampled: 11/16/18 @ 11:00	
Sample Matrix: <b>Soil Vapor</b>								
.....continued								
1,3-Dichloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
2,2-Dichloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1-Dichloropropene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
cis-1,3-Dichloropropene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
trans-1,3-Dichloropropene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Diisopropyl Ether (DiPE)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Ethylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Ethyl-t-Butyl Ether (EtBE)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Hexachlorobutadiene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
2-Hexanone	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
Isopropylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
4-Isopropyltoluene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Methylene Chloride	<0.1		µg/L	EPA 8260B	1.0	0.1	11/16/18	AL
4-Methyl-2-Pentanone (MIBK)	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
Methyl-t-butyl Ether (MtBE)	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Naphthalene	<0.050		µg/L	EPA 8260B	1.0	0.050	11/16/18	AL
n-Propylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Styrene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1,1,2-Tetrachloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1,2,2-Tetrachloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Tetrachloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Toluene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2,3-Trichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2,4-Trichlorobenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1,1-Trichloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,1,2-Trichloroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Trichloroethene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2,3-Trichloropropane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Trichlorofluoromethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Trichlorotrifluoroethane	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
1,2,4-Trimethylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL

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## CERTIFICATE OF ANALYSIS

1811-00149

Date Reported 11/18/18

Date Received 11/16/18

Invoice No. 84029

Cust # G073

Permit Number

Customer P.O.

HILLMANN CONSULTING  
DAN LOUKS  
1745 ORANGEWOOD AVE., #110  
ORANGE, CA 92868

Project: 20621 LAKE FOREST DR., LAKE FOREST

Analysis	Result	Qual	Units	Method	DF	RL	Date	Tech
Sample: 004 <b>SG4-8</b>					Date & Time Sampled:		11/16/18 @ 11:00	
Sample Matrix: <b>Soil Vapor</b>								
.....continued								
1,3,5-Trimethylbenzene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
Vinyl Chloride	<0.050		µg/L	EPA 8260B	1.0	0.050	11/16/18	AL
m,p-Xylenes	<0.20		µg/L	EPA 8260B	1.0	0.20	11/16/18	AL
o-Xylene	<0.10		µg/L	EPA 8260B	1.0	0.10	11/16/18	AL
[VOC Vapor Sampling Tracer]								
Isopropanol (IPA)	<1.0		µg/L	EPA 8260B	1.0	1.0	11/16/18	AL
[VOC Surrogates]								
Dibromofluoromethane	106		%REC	EPA 8260B		70-130	11/16/18	AL
Toluene-D8	100		%REC	EPA 8260B		70-130	11/16/18	AL
Bromofluorobenzene	97		%REC	EPA 8260B		70-130	11/16/18	AL

Respectfully Submitted:

Ken Zheng - Lab Director

### QUALIFIERS

B = Detected in the associated Method Blank at a concentration above the routine RL.  
B1 = BOD dilution water is over specifications. The reported result may be biased high.  
D = Surrogate recoveries are not calculated due to sample dilution.  
E = Estimated value; Value exceeds calibration level of instrument.  
H = Analyte was prepared and/or analyzed outside of the analytical method holding time  
I = Matrix Interference.  
J = Analyte concentration detected between RL and MDL.  
Q = One or more quality control criteria did not meet specifications. See Comments for further explanation.  
S = Customer provided specification limit exceeded.

### ABBREVIATIONS

DF = Dilution Factor  
RL = Reporting Limit, Adjusted by DF  
MDL = Method Detection Limit, Adjusted by DF  
Qual = Qualifier  
Tech = Technician

As regulatory limits change frequently, A & R Laboratories advises the recipient of this report to confirm such limits with the appropriate federal, state, or local authorities before acting in reliance on the regulatory limits provided.

For any feedback concerning our services, please contact Jenny Jiang, Project Manager at 951.779.0310. You may also contact Ken Zheng, President at office@arlaboratories.com.



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## QUALITY CONTROL DATA REPORT

HILLMANN CONSULTING  
 PACIFIC PALISADES, CA 90272

1811-00149

Date Reported 11/18/2018  
 Date Received 11/16/2018  
 Date Sampled 11/16/2018  
 Invoice No. 84029  
 Customer # G073  
 Customer P.O.

Project: 20621 LAKE FOREST DR., LAKE FOREST

**Method # EPA 8260B**

QC Reference # 77565 Date Analyzed: 11/16/2018 Technician: AL

Samples 001 002 003 004

**Results**

LCS %REC

1,1-Dichloroethene	90
Benzene	100
Chlorobenzene	105
Toluene	125
Trichloroethene	100

**Control Ranges**

LCS %REC

70 - 130
70 - 130
70 - 130
70 - 130
70 - 130

**Method # LUFT GCMS**

QC Reference # 77566 Date Analyzed: 11/16/2018 Technician: AL

Samples 003 004

**Results**

LCS %REC

C4-C12	93
--------	----

**Control Ranges**

LCS %REC

70 - 130
----------

No method blank results were above reporting limit

Respectfully Submitted:

*Ken Zheng*

Ken Zheng - President

For any feedback concerning our services, please contact Jenny Jiang, Project Manager at 951.779.0310. You may also contact Ken Zheng, President at office@arlaboratories.com.



# APPENDIX C

## Drilling Logs

## DRILL/LITHOLOGIC LOG

**BORING/WELL NUMBER** SG1  
**PROJECT** Nakase Nursery-Maintenance Area **OWNER** \_\_\_\_\_  
**LOCATION** 20621 Lake Forest Drive, Lake Forest, CA **PROJECT NUMBER** \_\_\_\_\_  
**DATE DRILLED** November 14, 2018 **TOTAL DEPTH OF HOLE** 5 Feet  
**SURFACE ELEVATION** \_\_\_\_\_ **DEPTH TO WATER** \_\_\_\_\_  
**SCREEN: DIA.** \_\_\_\_\_ **LENGTH** \_\_\_\_\_ **SLOT SIZE** \_\_\_\_\_  
**CASING: DIA.** \_\_\_\_\_ **LENGTH** \_\_\_\_\_ **TYPE** \_\_\_\_\_  
**DRILLING COMPANY** Hillmann **DRILL METHOD** Hand Auger  
**DRILLER** Dan/Neil **LOG BY** Dan Louks

DEPTH (FEET)	WELL CONST		PID (PPM)	SAMPLES		SOIL CLASS (USCS)	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
	PIPE	FILL		NUMBER	BLOW		
0-4			0.0			SM	Silty SAND; light brown, very fine sand, loose, no odor.
5			0.0			ML	Clayey SILT; brown, low plasticity, some very fine sand, no odor.
							Install Probe SG1 at 5 feet. Seal with bentonite and remove after soil gas sampling.

## DRILL/LITHOLOGIC LOG

**BORING/WELL NUMBER** SG2  
**PROJECT** Nakase Nursery-Maintenance Area **OWNER** \_\_\_\_\_  
**LOCATION** 20621 Lake Forest Drive, Lake Forest, CA **PROJECT NUMBER** \_\_\_\_\_  
**DATE DRILLED** November 14, 2018 **TOTAL DEPTH OF HOLE** 5 Feet  
**SURFACE ELEVATION** \_\_\_\_\_ **DEPTH TO WATER** \_\_\_\_\_  
**SCREEN: DIA.** \_\_\_\_\_ **LENGTH** \_\_\_\_\_ **SLOT SIZE** \_\_\_\_\_  
**CASING: DIA.** \_\_\_\_\_ **LENGTH** \_\_\_\_\_ **TYPE** \_\_\_\_\_  
**DRILLING COMPANY** Hillmann **DRILL METHOD** Hand Auger  
**DRILLER** Dan/Neil **LOG BY** Dan Louks

DEPTH (FEET)	WELL CONST		PID (PPM)	SAMPLES		SOIL CLASS (USCS)	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
	PIPE	FILL		NUMBER	BLOW		
0-4			0.0			SM	Silty SAND; brown, very fine sand, loose, no odor.
5			0.0			ML	SILT; brown, low plasticity, some very fine sand and clay, no odor.
							Install Probe SG2 at 5 feet. Seal with bentonite and remove after soil gas sampling.

## DRILL/LITHOLOGIC LOG

**BORING/WELL NUMBER** SG3  
**PROJECT** Nakase Nursery-UST Area **OWNER** \_\_\_\_\_  
**LOCATION** 20621 Lake Forest Drive, Lake Forest, CA **PROJECT NUMBER** \_\_\_\_\_  
**DATE DRILLED** November 14, 2018 **TOTAL DEPTH OF HOLE** 12 Feet  
**SURFACE ELEVATION** \_\_\_\_\_ **DEPTH TO WATER** \_\_\_\_\_  
**SCREEN: DIA.** \_\_\_\_\_ **LENGTH** \_\_\_\_\_ **SLOT SIZE** \_\_\_\_\_  
**CASING: DIA.** \_\_\_\_\_ **LENGTH** \_\_\_\_\_ **TYPE** \_\_\_\_\_  
**DRILLING COMPANY** Hillmann **DRILL METHOD** Hand Auger  
**DRILLER** Dan/Neil **LOG BY** Dan Louks

DEPTH (FEET)	WELL CONST		PID (PPM)	SAMPLES		SOIL CLASS (USCS)	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
	PIPE	FILL		NUMBER	BLOW		
0-4			0.0			SM	Silty SAND; brown, very fine sand, loose, no odor.
4-8			0.0			ML	Clayey SILT; brown, low plasticity, some very fine sand, no odor.
8-12			0.0			SM	Silty SAND; brown, very fine sand, loose, no odor. Refusal at 12 feet Bedrock. Install Probe SG3 at 12 feet. Seal with bentonite and remove after soil gas sampling.

## DRILL/LITHOLOGIC LOG

**BORING/WELL NUMBER** SG4  
**PROJECT** Nakase Nursery-UST Area **OWNER** \_\_\_\_\_  
**LOCATION** 20621 Lake Forest Drive, Lake Forest, CA **PROJECT NUMBER** \_\_\_\_\_  
**DATE DRILLED** November 14, 2018 **TOTAL DEPTH OF HOLE** 8 Feet  
**SURFACE ELEVATION** \_\_\_\_\_ **DEPTH TO WATER** \_\_\_\_\_  
**SCREEN: DIA.** \_\_\_\_\_ **LENGTH** \_\_\_\_\_ **SLOT SIZE** \_\_\_\_\_  
**CASING: DIA.** \_\_\_\_\_ **LENGTH** \_\_\_\_\_ **TYPE** \_\_\_\_\_  
**DRILLING COMPANY** Hillmann **DRILL METHOD** Hand Auger  
**DRILLER** Dan/Neil **LOG BY** Dan Louks

DEPTH (FEET)	WELL CONST		PID (PPM)	SAMPLES		SOIL CLASS (USCS)	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)
	PIPE	FILL		NUMBER	BLOW		
0-4			0.0			SM	Silty SAND; brown, very fine sand, loose, no odor.
4-8			0.0			ML	Clayey SILT; brown, low plasticity, some very fine sand, no odor.  Refusal at 8 feet Concrete. Channel Conduit?  Install Probe SG4 at 8 feet. Seal with bentonite and remove after soil gas sampling.

APPENDIX D  
Soil Gas Monitoring Data

# SOIL GAS MONITORING DATA FORM

**PROJECT:** Nakase Nursery Maintenance Area  
**LOCATION:** 20621 Lake Forest Drive, Lake Forest, California  
**DATE:** November 16, 2018

	VAPOR PROBE INFO							
<b>PROBE ID</b>	<b>SG1</b>	<b>SG2</b>	<b>SG3</b>	<b>SG4</b>				
<b>PROBE DEPTH (ft)</b>	5	5	12	8				
	EXTRACTION DATA							
<b>Applied Vacuum (in. WC)</b>	<5	<5	<5	<5				
<b>FLOW (L/min)</b>	0.2	0.2	0.2	0.2				
<b>Pore Volumes (borehole - sand pack)</b>	3	3	3	3				
	MONITORING DATA							
<b>OXYGEN (%)</b>	18.2	16.8	14.3	15.8				
<b>CARBON DIOXIDE (%)</b>	0.56	0.45	0.6	0.5				
<b>VOC by PID (ppm)</b>	0.0	0.0	0.0	0.0				

	VAPOR PROBE INFO							
<b>PROBE ID</b>								
<b>PROBE DEPTH (ft)</b>								
	EXTRACTION DATA							
<b>Applied Vacuum (in. WC)</b>								
<b>FLOW (L/min)</b>								
<b>Pore Volumes (borehole - sand pack)</b>								
	MONITORING DATA							
<b>OXYGEN (%)</b>								
<b>CARBON DIOXIDE (%)</b>								
<b>VOC by PID (ppm)</b>								

**REMARKS:** \_\_\_\_\_

**SAMPLED BY:** DL