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By Alameda County Environmental Health at 4:14 pm, Sep 30, 2013

Ms. Karel Detterman  
Alameda County Environmental Health Department  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502

Re: 640 Brooklyn Avenue, Oakland, California 94606  
ACEHD Case No. RO0003114, GeoTracker ID T10000004795

Dear Ms. Detterman:

I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document are true and correct to the best of my knowledge.

Sincerely,



Mr. Jeffrey Jung



3330 Cameron Park Drive, Ste 550  
Cameron Park, California 95682  
(530) 676-6004 ~ Fax: (530) 676-6005

September 27, 2013  
Project No. 2185-0640-01

Ms. Karel Detterman  
Alameda County Environmental Health Department  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502

Subject: **Soil and Groundwater Investigation Work Plan**  
Casa Amiga Apartments  
640 Brooklyn Avenue  
Oakland, California 94606

Dear Ms. Detterman:

On behalf of Mr. Jeffrey Jung, Stratus Environmental, Inc. (Stratus) has prepared this *Soil and Groundwater Investigation Work Plan (Work Plan)* to evaluate the extent of petroleum hydrocarbon impacted soil and groundwater at the Casa Amiga Apartments (the site) located at 640 Brooklyn Avenue, Oakland, California. This *Work Plan* has been prepared in response to Alameda County Environmental Health Department (ACEHD) correspondence dated August 13, 2013.

## **SITE DESCRIPTION**

The subject site is located at 640 Brooklyn Avenue in Oakland, California. The site is currently used as a residential apartment complex in a residential neighborhood. The subject site is at an elevation of approximately 95 feet above mean sea level (amsl). Lake Merritt is located 1,200 feet west of the property at an elevation of approximately 4 feet amsl. Groundwater flow in the area appears to be moving west to southwest toward the lake. A site location map and current site plan are shown as Figures 1 and 2, respectively.

## **SITE BACKGROUND**

One underground storage tank (UST) was discovered to exist beneath the sidewalk along Brooklyn Avenue in front of the subject site during a Phase I environmental site assessment. Golden Gate Tank Removal, Inc. (GGTR) was retained and scheduled to excavate and remove the UST from the subject site. Excavation began in February 2013, and after overburden soil was removed from the area and stockpiled, a 750-gallon UST containing residual diesel fuel was observed. The UST was situated 8 feet below ground surface (bgs) at bottom, measured 8 feet in length by 4 feet in width, and was constructed

of single-wall bare steel. After removal, the UST was transported to Circosta Iron & Metal, Inc. in San Francisco, California, for disposal and recycling.

Field observations during removal indicated there was a visible hole in the tank. Soil discoloration and petroleum hydrocarbon odor was observed during the removal of the UST. One soil sample (9325 C-10) was collected from 2 feet below (10 feet bgs) the center of the tank. Additionally, one four-point soil composite sample (9325 SP-COMP (A-D)) was collected from the stockpiled overburden soil. Samples were analyzed for total petroleum hydrocarbon as diesel (TPHd), as well as benzene, toluene, ethylbenzene, and total xylenes (collectively BTEX), methyl tertiary butyl ether (MTBE), and lead. Analysis of these samples did in fact indicate a release in soil. TPHd was reported at a maximum concentration of 4,820 milligrams per kilogram (mg/Kg) in the soil sample (9325 C-10) collected from beneath the former UST. Based upon these results, over-excavation around the former tank location was conducted to 16 feet bgs on March 27, 2013. Two confirmation soil samples were collected from the base of the excavation near the western (9325-EX-W-16) and eastern (9325-EX-E-16) ends of the excavation. In addition to the analytes above, fuel oxygenates di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), tert-butyl alcohol (TBA), tert-amyl methyl ether (TAME) and lead scavengers 1,2-dibromoethane (EDB) and 1,2-dichloroethane (1,2-DCA) were analyzed for in the confirmation soil samples. Soil analytical results reported concentrations of TPHd of 875<sup>1</sup> and 227 mg/Kg from samples 9325-EX-W-16 and 9325-EX-E-16, respectively. All other analytes were reported below laboratory detection limits. Approximately 7.85 tons of over-excavated soil was transported to Vasco Road Landfill Facility in Livermore, California, for proper disposal. Stockpiled overburden, along with 10 yards of clean imported soil, was used to backfill the excavation. Groundwater was not encountered at any point during the excavation. Historical soil sample locations and analytical data are shown in Figure 2 and Table 1, respectively.

## PROPOSED SCOPE OF WORK

The objective of the proposed scope of work is to:

- Assess the vertical extent of petroleum hydrocarbon impact to the subsurface below the location of the former UST.

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<sup>1</sup> Reported above the Regional Water Quality Control Board, San Francisco Bay Region, Environmental Screening Levels (May 2013) of 530 mg/Kg for middle distillates in deep soil, residential, with groundwater as a drinking source.

To accomplish this objective, Stratus is proposing the following work activities:

- Advance one (1) direct push soil boring near the confirmation soil sample 9325-EX-W-16 location using a direct push drilling rig,
- Collect continuous soil samples starting from the base of the former excavation (16 feet bgs) to first encountered groundwater. Collect one (1) grab groundwater sample if groundwater is encountered,
- Submit soil and groundwater samples for chemical analysis to a state-certified laboratory.

The proposed scope of work presented above has been subdivided into tasks 1 through 5. All geologic work will be conducted under the direct supervision of a State of California Professional Geologist (P.G.) or Professional Engineer (P.E.),

#### **Task 1: Pre-Field Activities**

Following approval of this *Work Plan*, the following activities will be completed:

- Obtain an encroachment permit from the City of Oakland for the advancement of one soil boring in the City sidewalk,
- Obtain a soil boring permit from the ACEHD,
- Retain and schedule a licensed C-57 contractor,
- Prepare a site specific Health and Safety Plan (HASP),
- Mark boring location and contact Underground Services Alert (USA) to locate underground utilities in the vicinity of the work area, and
- Notify ACEHD, the City of Oakland, and property owner of intended work schedule.

#### **Task 2: Field Activities**

Prior to beginning the advancement of the soil boring, appropriate traffic control measures (pedestrian and/or vehicle) will be set up.

A Stratus geologist, under the direct supervision of a California Professional Geologist (P.G.), will oversee a licensed C-57 drilling contractor advance one soil boring near the confirmation soil sample 9325-EX-W-16 location using a direct push drilling rig to first encountered groundwater. Stratus performed an online GeoTracker and Alameda County

Environmental Health (LUST/SLIC sites) database search and was unable to locate nearby sites with comparable physical attributes in order to assess the anticipated depth to groundwater. Stratus proposes advancing the soil boring to first encountered groundwater or until a minimum of 10 feet below the “observable,” visual and olfactory, vertical extent of petroleum hydrocarbon impacted soil is delineated

The initial 5 feet of the boring will be hand cleared using a hand auger, and/or other hand tools, to reduce the possibility of damaging any underground utilities. The boring will be continuously cored using a double-walled sampling system equipped with disposable 4-foot clear PVC liners. During advancement of the boring, soil samples will be cut out and collected from the liners at designated intervals for possible chemical analysis. Soil samples will be capped with Teflon sheets and sealed with plastic caps. Each sample will be labeled, placed in a resealable plastic bag, and stored in an ice-chilled cooler for transport to a state certified analytical laboratory. A minimum of two soil samples will be collected and submitted for chemical analysis, the sample collected from the terminus of the boring and the sample with the highest observable petroleum hydrocarbon impacted soil. Chain of custody procedures will be followed from the time the samples are collected to the time the samples are relinquished to the laboratory.

Soil will be continuously logged and classified onsite using the Unified Soil Classification System. Any other pertinent geological information and olfactory observations will also be recorded on a boring log.

Select sections of the remaining soil core will be removed and placed in resealable plastic bags to allow the accumulation of volatile organic compounds (VOC's) within the airspace of the plastic bags. The airspace within each bag will be screened for concentrations of VOC's in parts per million (ppm) using a photo-ionization detector (PID) and results will be recorded. Due to chemical properties of TPHd, the PID is not expected to detect concentrations of TPHd.

In the event that groundwater is encountered, 3/4- to 1-inch diameter PVC casing with 5 feet of slotted PVC casing will be placed within the direct push probe barrel. The probe barrel will then be retracted to a specific depth, as determined based upon field observations, to allow water to enter the slotted PVC casing. Once groundwater is purged clear, a grab groundwater sample will be collected using a clean, disposable bailer, or disposable tubing, and transferred to laboratory supplied glass vials (VOAs) containing a hydrochloric acid preservative. The groundwater sample will be labeled, placed in a resealable plastic bag, and stored in an ice-chilled cooler for transport to a state certified analytical laboratory. Chain of custody procedures will be followed from the time the sample is collected to the time the sample is relinquished to the laboratory.

After completion of the drilling, the borehole will be backfilled to existing surface grade using a neat cement slurry. The surface in which the soil boring was advanced will be restored to its original condition and/or according to City of Oakland encroachment permit conditions.

### **Task 3: Waste Management**

Due to the drilling method, soil cuttings generated during field activities are expected to be minimal. In the event that excessive soil cuttings are generated, cuttings will be placed in a DOT-approved, 55-gallon steel drum. The drum will be appropriately labeled and stored on-site pending proper disposal. A licensed contractor will transport the soil to an appropriate facility for disposal.

### **Task 4: Laboratory Analysis**

Soil and groundwater samples will be forwarded to a state-certified laboratory for chemical analysis following chain of custody procedures. Soil samples will be analyzed for TPHd using USEPA Method 8015B, and for BTEX using USEPA Method 8260C.

### **Task 5: Data Evaluation and Report Preparation**

After completion of all field activities and receipt of all analytical data, Stratus will prepare a results report that summarizes and documents all field activities and analytical results associated with the assessment of the subject site. Once reviewed and finalized by a State of California Professional Geologist (P.G.) or Professional Engineer (P.E.), the report will be submitted to ACEHD and uploaded to Geotracker.

## **SCHEDULE**

Upon receiving approval of this *Work Plan*, Stratus will first obtain an encroachment permit from the City of Oakland allowing the advancement of one direct push soil boring through the City sidewalk. A soil boring permit from ACEHD will also be obtained. A licensed C-57 contractor will then be scheduled and the proposed work will be implemented.

## **LIMITATIONS**

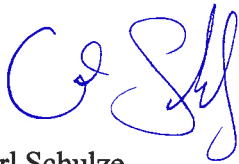
This *Work Plan* was prepared in general accordance with accepted standards of care that existed at the time this work was performed. No other warranty, expressed or implied, is made. Conclusions and recommendations are based on field observations and data obtained from this work and previous investigations. It should be recognized that definition and evaluation of geologic conditions is a difficult and somewhat inexact science. Judgments leading to conclusions and recommendations are generally made

with an incomplete knowledge of the subsurface conditions present. More extensive studies may be performed to reduce uncertainties. This *Work Plan* is solely for the use and information of our client unless otherwise noted.

If you have any questions or comments concerning this document, please contact Trevor Hartwell at (530) 313-9966.

Sincerely,

*STRATUS ENVIRONMENTAL, INC.*



Carl Schulze  
Staff Geologist

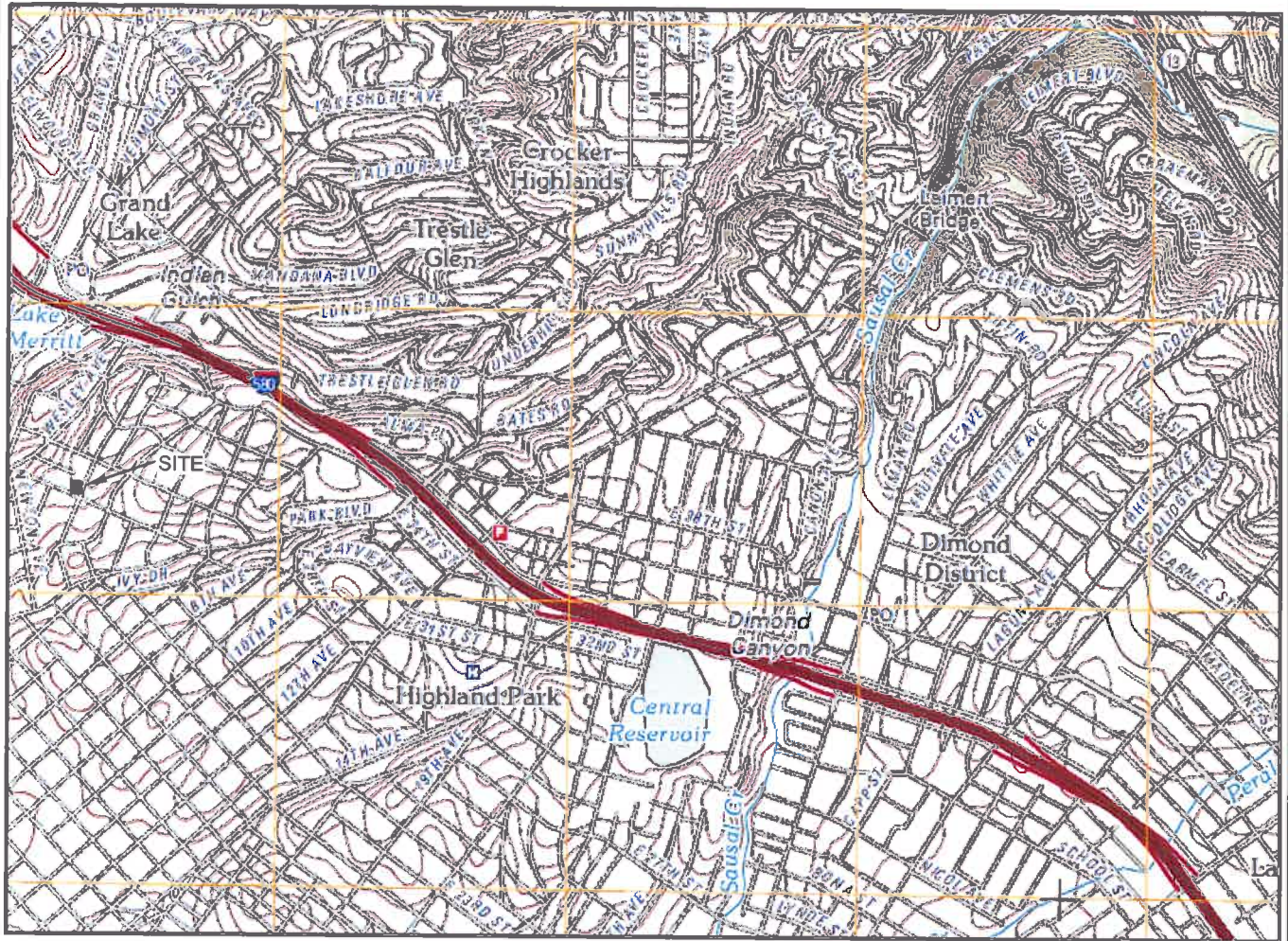


Trevor Hartwell, P.G.  
Project Manager



Attachments: Figure 1      Site Location Map  
                  Figure 2      Site Plan  
                  Table 1      Historical Soil Analytical Data

cc: Mr. Jeffrey Jung



GENERAL NOTES:  
 BASE MAP FROM U.S.G.S.  
 OAKLAND EAST, CA.  
 7.5 MINUTE TOPOGRAPHIC  
 PHOTOREVISED 2012



QUADRANGLE LOCATION



SCALE 1:24,000

*STRATUS*  
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CASA AMIGA APARTMENTS  
 640 BROOKLYN AVENUE  
 OAKLAND, CALIFORNIA

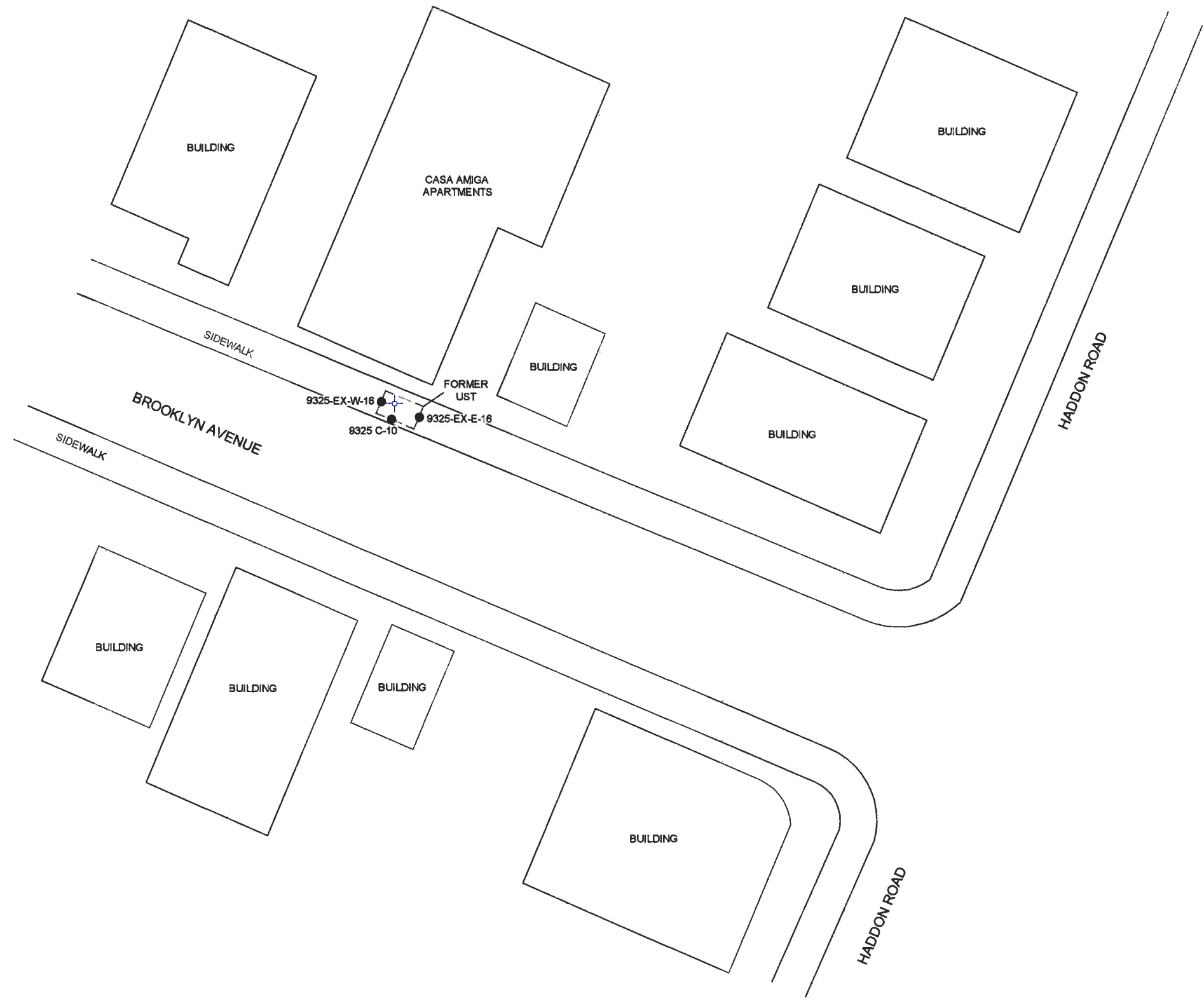
SITE LOCATION MAP

FIGURE

1

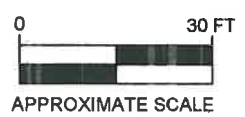
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 2185-0640-01





LEGEND  
● 9325 C-10 SOIL SAMPLE LOCATION  
⊕ PROPOSED SOIL BORING LOCATION

*STRATUS*  
ENVIRONMENTAL, INC.



CASA AMIGA APARTMENTS  
640 BROOKLYN AVENUE  
OAKLAND, CALIFORNIA

SITE PLAN

FIGURE  
**2**  
PROJECT NO.  
2185-0640-01

**TABLE 1**  
**HISTORICAL SOIL ANALYTICAL DATA**  
 Casa Amiga Apartments  
 640 Brooklyn Avenue, Oakland, California

Sample Location	Sample Depth (feet bgs)	Date Collected	TPHd (mg/Kg)	Benzene (mg/Kg)	Toluene (mg/Kg)	Ethyl-benzene (mg/Kg)	Total Xylenes (mg/Kg)	MTBE (mg/Kg)	TBA (mg/Kg)	DIPE (mg/Kg)	ETBE (mg/Kg)	TAME (mg/Kg)	1,2-DCA (mg/Kg)	EDB (mg/Kg)	Lead (mg/Kg)
9325 C-10	10	02/14/13	4,820	<23	<23	<23	127	<47	--	--	--	--	--	--	7.1
9325 SP-COMP (A-D)	SP	02/14/13	13.1	<0.47	<0.47	<0.47	<0.94	<0.94	--	--	--	--	--	--	48
9325-EX-E-16	16	03/27/13	227	<2.3	<2.3	<2.3	<4.6	<4.6	<46	<2.3	<2.3	<2.3	<2.3	<2.3	--
9325-EX-W-16	16	03/27/13	875	<2.0	<2.0	<2.0	<4.1	<4.1	<41	<2.0	<2.0	<2.0	<2.0	<2.0	--

<p><b><u>Explanation</u></b>          TPHd = Total petroleum hydrocarbons as diesel (C10-C28)          BTEX = Benzene, toluene, ethylbenzene, and xylenes          MTBE = Methyl tertiary butyl ether          TBA=Tertiary butyl alcohol          DIPE =Di-isopropyl ether          ETBE = Ethyl tertiary butyl ether          TAME = Tertiary amyl methyl ether          1,2-DCA=1,2-Dichloroethane          EDB = 1,2-Dibromoethane          mg/Kg = milligrams per kilogram          SP = Stockpiled overburden</p>	<p><b><u>Analytical Methods</u></b>          TPHd analyzed using EPA Method SW846 8015B          BTEX, MTBE, TBA, DIPE, ETBE, TAME, 1,2-DCA, and EDB analyzed using EPA Method SW8260C          Lead analyzed using EPA Method SW846 6010B</p> <p><b><u>Analytical Laboratory</u></b>          Northern California Accutest Laboratories (08258CA)</p>
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