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By Alameda County Environmental Health 2:44 pm, Nov 09, 2015

**PERJURY STATEMENT**

Subject: Fuel Lake Case No. Ro0002981 and Geotracker Clobal ID T1000000416, Red Hanger Cleaners, 6335-6339 College Ave., Oakland, CA 94618

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

**Ted Cleveland**
Vice President – Eastern Region
EFI Global, Inc.

# P&D ENVIRONMENTAL, INC.

**55 Santa Clara Ave, Suite 240**
**Oakland, CA 94610**
**(510) 658-6916**


November 9, 2015
Work Plan 0461.W2

Mr. Keith Nowell
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

SUBJECT: SUB-SLAB DEPRESSURIZATION FEASIBILITY TEST WORK PLAN
ACEH Case # RO2981 and GeoTracker Global ID T10000000416
Red Hanger Kleaners
6235-6239 College Avenue
Oakland, CA

Dear Mr. Nowell:

P&D Environmental, Inc. (P&D) has prepared this work plan for a sub-slab depressurization feasibility testing at the subject site on behalf of the property owner Ronald Elvidge and EFI Global, Inc. (EFI). The feasibility test objective is to determine if sub-slab depressurization is feasible as a mitigation measure for vapor intrusion of the dry cleaning chemical tetrachloroethene (PCE) at the site. The work scope includes extracting sub-slab vapors at three different locations in the former dry cleaner space, monitoring vacuum at surrounding locations, and collection of soil gas samples from the blower exhaust at the conclusion of extraction at each of the three locations. All work will be performed under the direct supervision of a professional geologist.

A Site Location Map is attached as Figure 1 and a Site Plan showing proposed sub-slab extraction locations SSE1 through SSE3 and vacuum observation locations VP1 through VP8 at the site is attached as Figure 2.

## BACKGROUND

A discussion of the historical site use as a drycleaner and historical subsurface and indoor air investigations is provided in P&D's October 16, 2015 Soil Gas Investigation Work Plan (document 0461.W1), and P&D's November 3, 2015 Indoor Air Investigation and Mitigation Report. Historical soil gas PCE concentrations at a depth of five feet below the ground surface (bgs) and sub-slab PCE soil gas concentrations are shown on Figure 2. Proposed soil gas wells shown on Figure 2 are associated with a different work scope set forth in P&D's October 16, 2015 work plan.

## SCOPE OF WORK

P&D will perform the following tasks for installation sub-slab depressurization pilot testing at the subject site.

- Health and safety plan preparation.
- Floor slab coring at three locations (SSE1 through SSE3) for extraction and installation of vacuum observation Vapor Pins VP2 through VP8. Vapor Pin VP1 will be installed associated with soil gas well installation which is addressed in a different work plan.
- Sub-slab depressurization pilot test flow, vacuum, radius of influence, and extracted vapor sample collection.
- Arrange for laboratory analysis of one air sample collected from each well where vacuum is applied.
- Report preparation.

Each of these is discussed below in detail.

Health and Safety Plan Preparation

A health and safety plan will be prepared for the scope of work identified in this work plan. Prior to the beginning of field work, the drilling location will be marked with white paint and Underground Service Alert will be notified for underground utility location.

Sub-Slab Vapor Extraction Location and Vapor Pin Installation

Three holes measuring 5-inches in diameter and designated as SSE1 through SSE3 will be cored through the building floor slab and seven Vapor Pins designated as VP2 through VP8 will be installed at locations shown on Figure 2. Vapor Pin VP1 will be installed associated with soil gas well installation which is addressed in a different work plan. The cored holes will be fitted with 4-inch diameter PVC pipe that will be caulked in place and fitted with PVC caps, and the Vapor Pins will be installed as recessed Vapor Pins with flush-mounted secured stainless steel covers. Temporary valves with barbs will be installed at each Vapor Pin and in the PVC cap at each concrete cored location for vacuum monitoring during the feasibility test.

Sub-Slab Depressurization Pilot Test

Prior to the application of vacuum to the first extraction location, baseline vacuum values will be measured using a digital manometer and/or Magnehelic gages at each vapor extraction well and at each sub-slab monitoring port to establish baseline vacuum conditions.

During the sub-slab depressurization pilot test, vacuum will be applied sequentially to each of the extraction locations and vacuum will be simultaneously monitored at all Vapor Pin locations (VP1 through VP8) and at extraction locations where extraction is not being performed. Vacuum will be applied for up to 2 hours at each extraction location with a 1 horsepower regenerative blower capable of generating a maximum air flow of 92 cubic feet per minute (cfm) and a maximum

vacuum of 48 inches of water column. Air flow will be monitored with a hot wire anemometer, and vacuum will be monitored with digital monometers and/or Magnehelic gages. Organic vapor concentrations of extracted air will be monitored using a portable Photoionization Detector that will be calibrated with a 100 ppm isobutylene standard. Emissions from the blower will be abated using one 55-gallon drum containing granular activated carbon. Vacuum, flow, and PID values will be recorded on field forms.

One air sample will be collected from the inlet to the blower into a 1-liter Summa canister at the conclusion of vapor extraction for each of the three extraction locations. Each sample will be collected using an unused manifold equipped with a nominal 150 cubic centimeter flow controller until the canister vacuum is approximately 5 inches of Mercury. Each canister will be labeled and stored in a box pending shipment to the laboratory. Chain of custody procedures will be observed for all sample handling.

The drum containing granular activated carbon will be labeled and stored at the site pending appropriate disposal.

Arrange for Sample Analysis

All three of the air samples collected from sub-slab extraction locations SSE1 through SSE3 will be analyzed at Eurofins-Air Toxics Ltd. of Folsom, California for Volatile Organic Compounds (VOCs) using EPA Method TO-15.

Report Preparation

Upon receipt of the laboratory analytical results, a report will be prepared. The report will document the pilot test procedures and results and will include a site map showing the sub-slab extraction locations, copies of field data sheets generated during the pilot test, a copy of the laboratory report, tables summarizing the sample results (including air flow, vacuum, radius of influence, and extracted vapor concentrations), recommendations based on the sample results, and the stamp of a professional geologist. A copy of the report and associated laboratory information (including EDFs) will be uploaded to the County ftp site and to GeoTracker.

November 9, 2015
Work Plan 0461.W2

Should you have any questions, please do not hesitate to contact us at (510) 658-6916.

Sincerely,

P&D Environmental, Inc.

Paul H. King
California Professional Geologist #5901
Expires: 12/31/15


Attachments:

Figure 1 – Site Location Map
Figure 2 – Site Plan Showing PCE Concentrations in Soil Gas and Sub-Slab Soil Gas

PHK/ sjc
0461.W2

# FIGURES

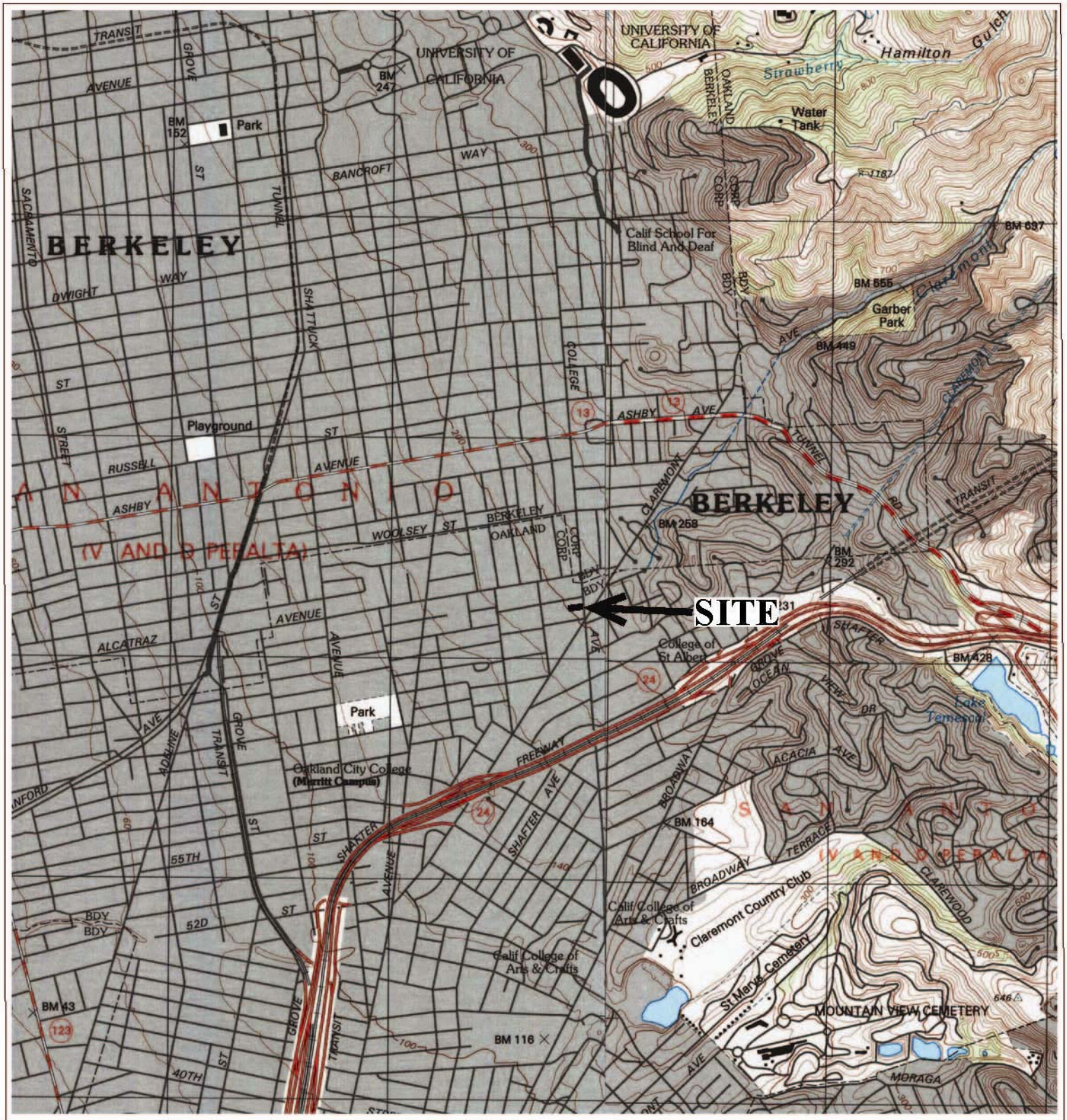


Figure 1
Site Location Map
Red Hanger Kleaners
6239 College Avenue
Oakland, California

Base Map From:
U.S. Geologic Survey 7.5 Minute Quadrangles Oakland East, and Oakland West, both maps edited 1996.

P&D Environmental, Inc.
55 Santa Clara Avenue, Suite 240
Oakland CA 94610

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Approximate Scale in Feet

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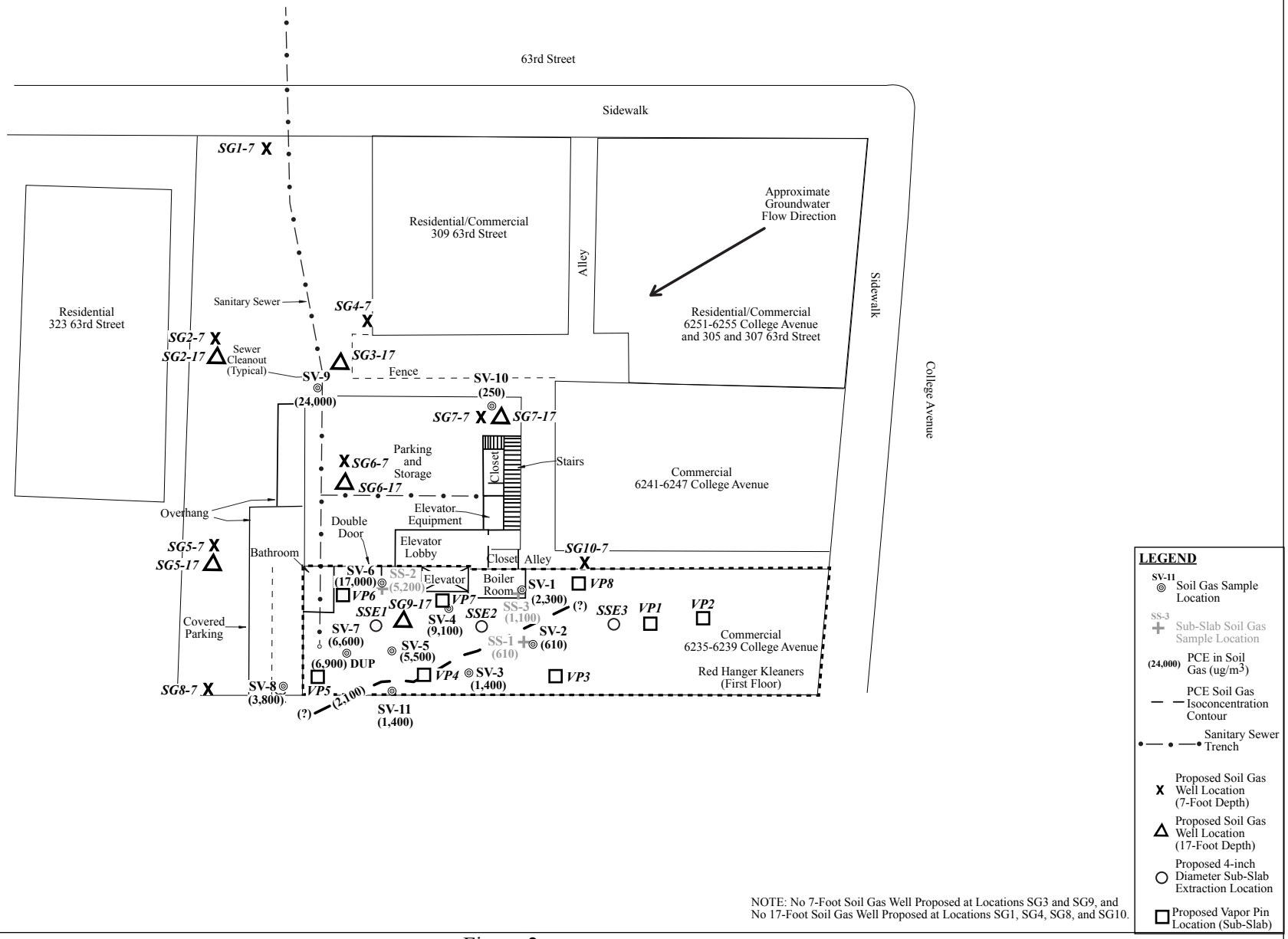


NOTE: No 7-Foot Soil Gas Well Proposed at Locations SG3 and SG9, and No 17-Foot Soil Gas Well Proposed at Locations SG1, SG4, SG8, and SG10.

**LEGEND**

- SV-11 — Soil Gas Sample Location
- SS-3 — Sub-Slab Soil Gas Sample Location
- (24,000) — PCE in Soil Gas (ug/m$^3$)
- PCE Soil Gas Isoconcentration Contour
- Sanitary Sewer Trench
- Proposed Soil Gas Well Location (7-Foot Depth)
- Proposed Soil Gas Well Location (17-Foot Depth)
- Proposed 4-inch Diameter Sub-Slab Extraction Location
- Proposed Vapor Pin Location (Sub-Slab)

Figure 2
Site Plan Showing PCE Concentrations in Soil Gas and Sub-Slab Soil Gas
Red Hanger Kleaners
6239 College Avenue
Oakland, California

Base Map from:
Gordon Building, July 30, 2007, Alameda County Assessor's Map, Revised June 15,1989, and Google Earth, 2015

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Oakland, CA 94610

0 15 30
Approximate Scale in Feet

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