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Alameda County
Environmental Health

September 2, 2010

Mr. Jerry Wickham
Senior Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94501-6577

Subject: Soil Vapor Investigation Work Plan
Pacific Shops, Inc.
1829 Clement Avenue
Alameda, California
SLIC Case No. RO0002624 and GeoTracker Global ID SLT2O00414

Dear Mr. Wickham:

Enclosed please find the *Soil Vapor Investigation Work Plan* (work plan) for the Pacific Shops, Inc., site located at 1829 Clement Avenue in Alameda, California (SLIC Case No. RO0002624 and GeoTracker Global ID SLT2O00414). This work plan was prepared by AMEC Geomatrix, Inc. (AMEC), on behalf of Pacific Shops, Inc., in response to a letter dated June 24, 2010, from the Alameda County Environmental Health Services Department (ACEH) to Pacific Shops, Inc.

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.

Please contact me at (510) 521-1133 or Darren Croteau of AMEC at (510) 663-4139 if you have any questions regarding this work plan.

Sincerely yours,

Sean Svendsen
Owner
Pacific Shops, Inc.

Attachment: Soil Vapor Investigation Work Plan

cc: Ed Conti, AMEC Geomatrix, Inc.



SOIL VAPOR INVESTIGATION WORK PLAN

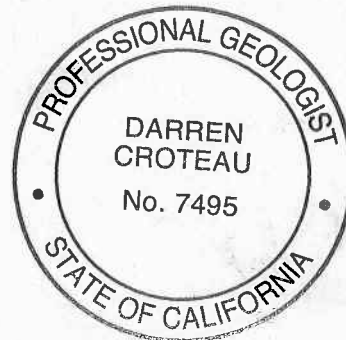
Pacific Shops, Inc.
1829 Clement Avenue
Alameda, California

September 2, 2010
Project 0147400000

This work plan was prepared by AMEC Geomatrix, Inc. under the professional supervision of Darren Croteau. The findings, recommendations, specifications and/or professional opinions presented in this work plan were prepared in accordance with generally accepted professional geologic practice, and within the scope of the project. There is no other warranty, either express or implied.

A handwritten signature in blue ink, appearing to read "Darren Croteau", written over a horizontal line.

Darren Croteau, P.G.
Senior Geologist





September 2, 2010

Project 0147400000

Mr. Sean Svendsen
Pacific Shops, Inc.
1829 Clement Avenue
Alameda, CA 94501

Subject: Soil Vapor Investigation Work Plan
Pacific Shops, Inc.
1829 Clement Avenue
Alameda, California
SLIC Case No. RO0002624 and GeoTracker Global ID SLT2O00414

Dear Mr. Svendsen:

AMEC Geomatrix, Inc. (AMEC), has prepared this *Soil Vapor Investigation Work Plan* (work plan) on behalf of Pacific Shops, Inc. (Pacific Shops), for the property located at 1829 Clement Avenue in Alameda, California (the site; Figure 1). This work plan has been prepared pursuant to a letter dated June 24, 2010, from the Alameda County Environmental Health Services Department (ACEH) to Mr. Sean Svendsen of Pacific Shops, Inc.¹ In their letter, ACEH requested a work plan for soil vapor or other appropriate sampling.

OBJECTIVE

The objective of the soil vapor investigation is to assess whether volatile organic compounds (VOCs) are present in soil vapor beneath the building at 1829 Clement Avenue.

SCOPE OF WORK

Four soil vapor samples will be collected at the proposed approximate locations shown on Figure 2. The methods and procedures for the soil vapor investigation are described below and are based on guidelines presented in the *Advisory – Active Soil Gas Investigations* (Advisory), jointly published by the California Department of Toxic Substances Control (DTSC) and the California Regional Water Quality Control Board, Los Angeles Region,² and the draft *Advisory – Active Soil Gas Investigation* (Draft Advisory) published by the California Environmental Protection Agency (EPA).³

Pre-Field Activities

Prior to commencing fieldwork, AMEC will perform the the following activities:

- Notify ACEH of the work schedule;
- Notify Underground Service Alert (USA) at least 48 hours in advance of beginning field work; and

¹ Alameda County Environmental Health, 2010, SLIC Case No. RO0002624 and Geotracker Global ID SLT2O00414, Pacific Shops, 1829 Clement Avenue, Alameda, CA 94501 – Email Submittal dated June 15, 2010, June 24.

² Department of Toxic Substances Control (DTSC) and California Environmental Protection Agency (Cal-EPA), 2003, *Advisory – Active Soil Gas Investigations*, January 28.

³ California Environmental Protection Agency, 2010, *Advisory – Active Soil Gas Investigation* (Draft for Public Comment), March.

Mr. Sean Svendsen
Pacific Shops, Inc.
September 2, 2010
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- Contract with a private utility locator to survey proposed boring locations for underground utilities.

We understand that Pacific Shops will prepare penetrations through the building floor and, if present, underlying concrete or asphalt for the soil vapor probes and ensure that the penetrations are clear of above ground utilities.

Field Methods

Four temporary soil vapor probes will be installed and sampled in accordance with the following methodology. The proposed locations are shown on Figure 2. The locations may be adjusted in the field based on field conditions, such as the locations of floor joists and utilities.

Temporary Vapor Probe Installation

Each probe will be installed at an approximate depth of 4.5 feet below ground surface (bgs) by a California C57-licensed contractor. The soil boring for each probe will be advanced using hand tools to drive stainless steel rods, fitted with a disposable tip, to the desired total depth (anticipated to be approximately 5 feet bgs). Each soil boring is planned to be advanced through the sub-floor space, from the building floor above.

Once the total desired depth has been reached, the drive rods will be retracted several inches, leaving the disposable tip in the ground, and new, disposable, small-diameter (e.g., 1/8-inch or 1/4-inch outside diameter) Teflon[®] tubing, fitted with a filter at the bottom to prevent particulate infiltration, will be placed in the boring at approximately 0.5 feet above the bottom of the boring. Approximately 12 inches of filter pack sand will be placed in the bottom of the boring, with the bottom of the Teflon[®] tubing placed midway through the filter pack sand.

Following installation of the sand pack, approximately 1 foot of dry granular bentonite will be placed in the boring. The boring will then be sealed to the ground surface in maximum 6-inch lifts with hydrated bentonite. A valve will be fitted to the above-ground end of the tubing and will remain closed prior to purging and sampling. The rods will be slowly retracted as all probe materials are installed in the boring.

If groundwater is encountered in any of the borings, bentonite chips will be emplaced in the open hole to seal the boring to the depth of the groundwater surface. A soil vapor probe will then be constructed immediately above the bentonite seal, using the methodology described above, with the exception that the interval of dry, granular bentonite may be reduced.

Each soil vapor probe will be allowed to equilibrate for a minimum of 30 minutes prior to purging and sampling.

Temporary Vapor Probe Purging

Following equilibration, AMEC will assemble a soil vapor sampling manifold that will allow each probe to be purged and a soil gas sample to be collected into a 1-liter Summa[™] canister. The manifold will include a Summa[™] canister and flow controller, and a three-way valve so that the purge port is not in line with the Summa[™] canister. Canisters and flow controllers will be provided by a California Department of Public Health–accredited laboratory.⁴

⁴ California laboratory accreditation is not yet available for U.S. EPA Method TO-15; however, samples will be shipped to a laboratory that is accredited by the California Environmental Laboratory Accreditation Program (ELAP) for other methods.

Mr. Sean Svendsen
Pacific Shops, Inc.
September 2, 2010
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Immediately prior to sampling, the tubing and manifold will be purged to clear the tubing and sample train of stagnant or ambient air. Because samples will be collected into Summa™ canisters for analysis at a fixed laboratory and analytical results will not immediately be available, a purge volume test will not be possible and the default of three purge volumes will be removed before sampling at each location. One purge volume will be calculated in the field based on the volume of the void space in the tubing plus an estimate of the void space in the sand pack. The estimated purge volume calculation is presented below.

Estimated purge volume: one purge volume \approx (internal volume of tubing) + (annular pore space around probe tip)

The vapor flow rate during purging will be limited to approximately 167 milliliters per minute (mL/min) using a universal pump calibrated with a volumetric air flow meter, consistent with the recommended flow rate range in the Advisory. The use of a consistent, low flow rate at each sample location is intended to limit vacuum-enhanced volatilization and ambient air intrusion.

Temporary Vapor Probe Sampling

Immediately following purging, a soil gas sample will be collected into a 1-liter Summa™ canister, which will be equipped with a flow controller that limits the flow rate into the canister to less than 200 mL/minute. The Summa™ canister will be allowed to fill almost completely. Following sampling, the Summa™ canister will be capped with a fitting to prevent ambient air intrusion during shipping, labeled, and stored in a cardboard box prior to being shipped to the analytical laboratory under AMEC chain-of-custody procedures.

Following sampling, the probe tubing will be pulled from the boring, and the surrounding bentonite and sand pack will remain in the ground. It is not anticipated that any waste will be generated during the investigation.

Quality Control Measures

This section presents quality control (QC) measures that will be implemented during the soil vapor investigation, including leak testing and collection of a duplicate sample.

Leak testing will be conducted prior to sampling using a shut-in test at each sampling location. During the shut-in test, a vacuum will be created in the sample train, extending to the valve closest to the ground surface, and the vacuum will be monitored over a period of several minutes to confirm that it remains stable. A tracer compound leak test will not be performed during sampling, because it would be necessary to fill a shroud at the ground surface with a tracer compound, and access to the ground surface via the sub-floor space will not be available.

A blind field duplicate sample will be collected at one sampling location. The duplicate sample will be collected simultaneously with the primary sample, using a laboratory-provided T-joint between the flow controller and two Summa™ canisters. The duplicate sample will be labeled with a false identifier and time, and will be stored in the manner of the primary samples and submitted to the analytical laboratory for the analysis of the same constituents as the primary samples.

Laboratory Analytical Methods

The SUMMA™ canisters will be shipped to the analytical laboratory and will be analyzed for VOCs using U.S. Environmental Protection Agency (U.S. EPA) Method TO-15.

Mr. Sean Svendsen
Pacific Shops, Inc.
September 2, 2010
Page 4 of 4

Reporting

AMEC will prepare a figure showing the sample locations. The figure and copies of the analytical laboratory report and sample chain-of-custody record will be provided to ACEH by Pacific Shops, and will also be uploaded the GeoTracker website.

ANTICIPATED SCHEDULE

We anticipate that field work will commence within four weeks of approval of this work plan by ACEH. We anticipate that the field investigation can be performed in one day. The results will be submitted to the ACEH approximately two weeks following the receipt of final laboratory data.

Please contact either of the undersigned if you have any questions or require additional information regarding this work plan.

Sincerely yours,
AMEC Geomatrix, Inc.



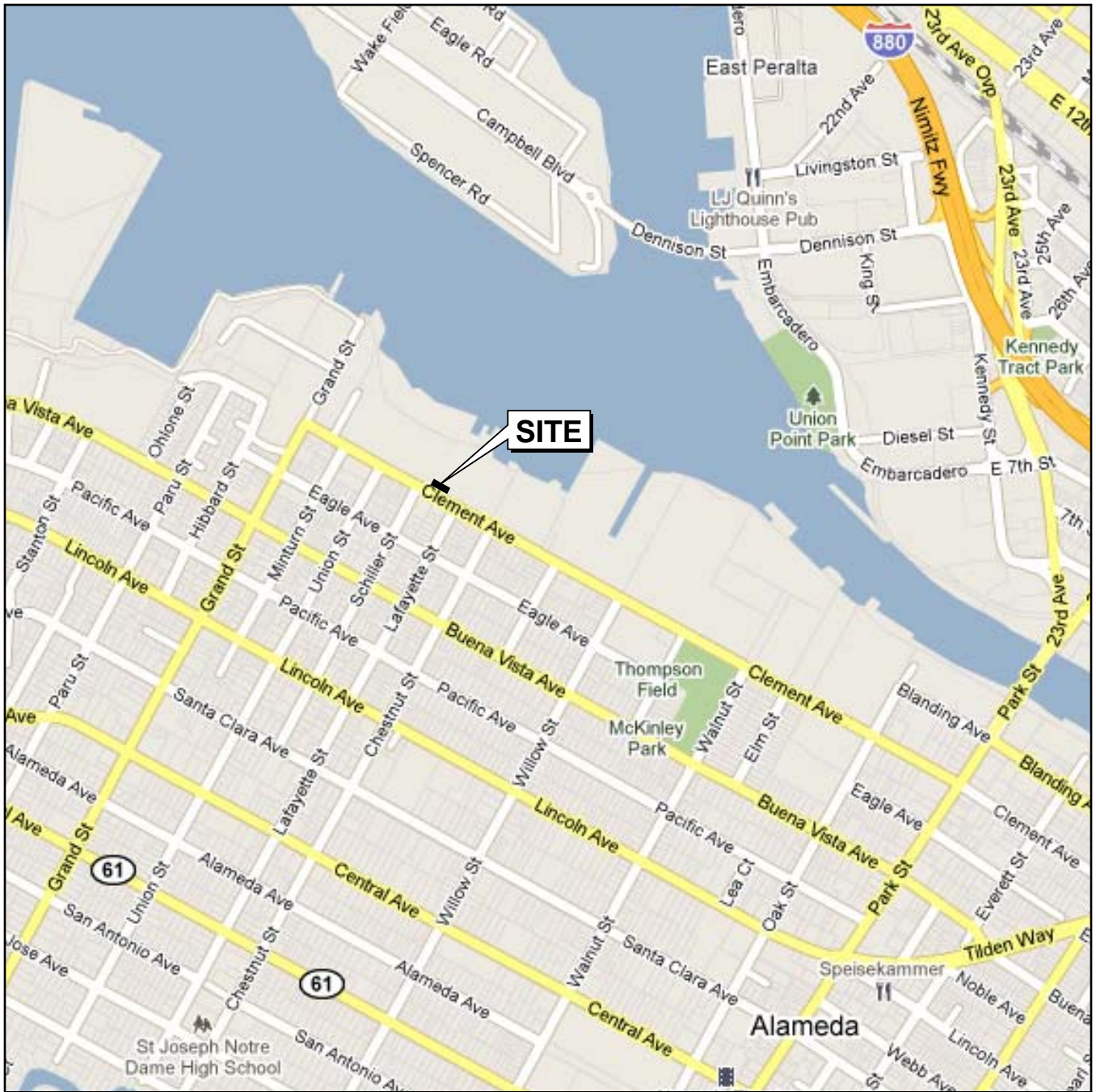
Edward P. Conti, C.E.G., C.HG.
Principal Geologist



Darren Croteau, P.G.
Senior Geologist

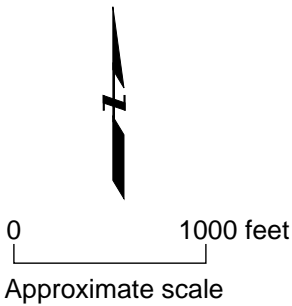
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Attachments: Figure 1 – Site Location Map
Figure 2 – Site Plan and Proposed Soil Vapor Sample Locations

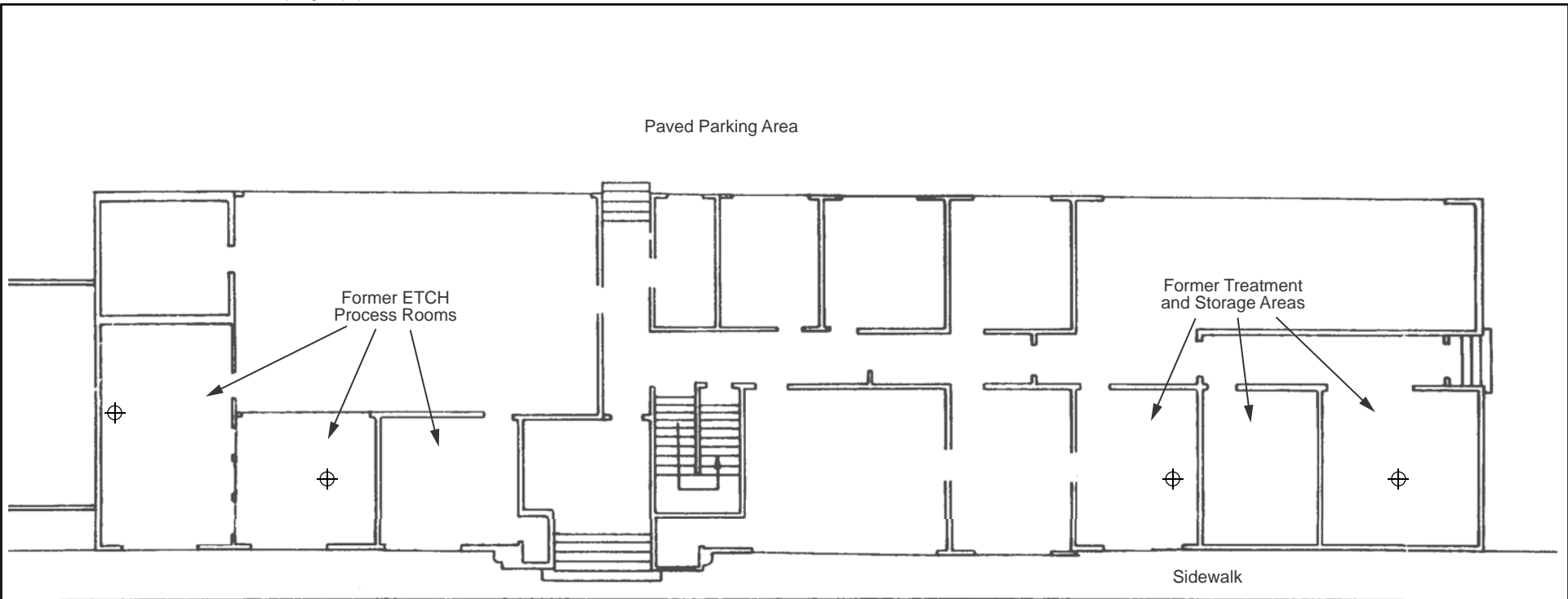


Base map from Google Maps 2010.

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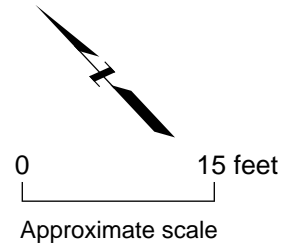
<p>SITE LOCATION MAP Pacific Shops, Inc. 1829 Clement Avenue Alameda, California</p>		
By: AP	Date: 08/11/2010	Project No. 14740.000
AMEC Geomatrix		Figure 1



LEGEND

⊕ Approximate location of proposed soil vapor sample

Note:
Figure from Kaldveer Associates, Soil Cleanup Report, dated July 18, 1990.



**SITE PLAN AND PROPOSED SOIL VAPOR
SAMPLE LOCATIONS**
Pacific Shops, Inc.
1829 Clement Avenue
Alameda, California

By: AP	Date: 08/30/2010	Project No. 14740.000
AMEC Geomatrix		Figure 2