



ENVIRONMENTAL  
PROTECTION

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**PROGRAM WORKPLAN FOR FURTHER  
GROUNDWATER INVESTIGATION AND  
HEALTH RISK EVALUATION  
FORMER YOUNG'S CLEANERS  
FOOTHILL SQUARE SHOPPING CENTER  
OAKLAND, CALIFORNIA**

Dear Messrs. Chan and Arigala:

This letter presents a workplan prepared by PES Environmental, Inc. (PES) on behalf of Drake Builders (Drake) for the Former Young's Cleaners site at the Foothill Square Shopping Center, Oakland, California. This Workplan describes procedures to implement further groundwater investigation activities and to evaluate health risks associated with possible contamination in groundwater from halogenated volatile organic compounds (VOCs). These activities are intended to address groundwater quality issues and potential health risks related to past dry cleaning solvent releases at the site. This program was discussed during a meeting held on November 27, 1996, with representatives of the San Francisco Bay Regional Water Quality Control Board (RWQCB; Sum Arigala), Alameda County Department of Environmental Health (ACDEH; Barney Chan), the property owner (Drake Builders; Richard and Joy Gilcrease), their environmental consultant (PES; Robert Creps and William Mast), and counsel to Drake Builders (Beveridge & Diamond; David Cooke and Julie Walters).

Past practices at the former dry cleaners apparently resulted in the release of perchlorethylene (PCE) which has affected soil and groundwater quality. In late 1995 and early 1996, affected soil at the source area was excavated and the overlying rental units were renovated. However, groundwater monitoring indicates residual PCE is present beneath the site. This Workplan has been developed to accomplish three primary goals related to this residual contamination:

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- Address regulatory agency concerns regarding the distribution of contamination in groundwater;
- Develop procedures to assess the potential risks to onsite and offsite receptors resulting from the presence of PCE in groundwater; and
- Establish a monitoring program to provide future evaluation of the position of an offsite groundwater plume, if present.

During the November 27 meeting, it was agreed that this Workplan would be prepared to provide details of an offsite groundwater investigation and monitoring program.

## **OFFSITE GROUNDWATER INVESTIGATION**

The objective of the offsite groundwater investigation is to evaluate the lateral and vertical extent of PCE (and possible degradation products), if present, in groundwater in the offsite upper and lower aquifer zones. The investigation will be conducted in two phases. The preliminary phase will consist of using direct-push exploration and sampling methods to collect discrete groundwater samples to assess the general distribution of PCE in onsite and offsite groundwater. Installation of sentry monitoring wells to provide long-term data on the offsite groundwater plume, if present, will comprise the second phase of field work. All work will be performed under permits issued by the Zone 7 Water Agency of the Alameda County Flood Control and Water Conservation District, and the City of Oakland.

### **Preliminary Groundwater Sampling**

At the six locations shown on Plate 1, holes will be advanced using a direct-push method. The sampling will consist of collecting lithologic data using Cone Penetrometer Test (CPT) technology. Using the CPT results, new holes will be advanced to the selected target sampling depths in both the shallow and deep groundwater zones. The shallow groundwater zone has been defined onsite as the uppermost water-bearing zone, typically from the water table to a depth of approximately 30 feet. The deep groundwater zone extends from approximately 30 to 55 feet below ground surface (bgs).

Groundwater samples will be collected from both the shallow and deep groundwater zones using BAT or HydroPunch<sup>TM</sup> groundwater samplers. Groundwater samples will be analyzed for chlorinated volatile organic compounds (VOCs) using EPA Test Method 8010. All CPT and groundwater sampling holes will be backfill using a bentonite grout pumped under pressure into the sampling hole via a tremie pipe.

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### **Monitoring Well Installation and Sampling**

Upon receipt of analytical results from the preliminary sampling, chemical results will be posted on a map and reviewed to establish monitoring well locations. This information will be forwarded to both ACDEH and RWQCB representatives for review and discussion. Because PCE has been primarily observed in the deep groundwater zone at the down-gradient boundary of the site, it is anticipated that any PCE present offsite may also be in the deep zone. As a result, it is estimated that up to three deep groundwater zone wells will be installed to provide data on the position of a groundwater plume related to past onsite releases of PCE.

Three soil samples will be collected during the drilling of the monitoring well borings and analyzed for Total Organic Carbon (TOC) by EPA Test Method 9060. This parameter, converted to the fraction of organic carbon ( $f_{oc}$ ) will be used in the evaluation of the fate and transport of PCE and possible degradation products as discussed below.

After installation is complete, the wells will be developed by surging and evacuating at least 10 well-casing volumes. The wells will be sampled at least 24 hours after completion of development. Groundwater samples will be analyzed for VOCs using EPA Test Method 8010. Additionally, PES proposes to analyze water samples from sentry wells for dissolved oxygen, oxidation/reduction potential, and the byproducts of VOC degradation, carbon dioxide, and methane to assess whether intrinsic remediation is ongoing.

### **EVALUATION OF POTENTIAL OFFSITE SOURCES**

PES is currently reviewing files to examine whether other sources of chlorinated VOCs are present, in the vicinity of the site. The task will be accomplished by conducting interviews or reviewing files at: (1) the City of Oakland (Building and Planning Department, Zoning Department, Business License Department, and Fire Department); (2) Sanborn Fire Insurance Maps; (3) Polk Address Directory; (4) ACDEH; and (5) East Bay Municipal Utility District.

### **EVALUATION OF HEALTH RISKS**

The objective of this task is to evaluate the potential health risks to onsite (shoppers, workers, and construction workers) and offsite (residential) receptors and the qualitative prospects for intrinsic remediation of the VOCs in groundwater. Because the PCE-impacted groundwater is predominantly not in a shallow zone discharging to surface waters, ecological risks will not be evaluated for this site.

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Evaluation of health risks will estimate ambient air concentrations of VOCs within the onsite shops and offices and offsite residences resulting from volatilization of residual VOCs that may be present in soil (onsite only) and/or groundwater beneath the site. Upward diffusion of the VOCs through the soil cover is modeled to calculate a vapor flux at the ground surface. A simplified air-mixing model is then used to estimate air concentrations in the buildings and residences. The estimated indoor air concentrations will then be compared to U.S. Environmental Protection Agency Region IX Preliminary Remediation Goals for air. For those samples that exceed the PRGs, a more detailed evaluation of potential health risk will be prepared using the following general methodology: (1) Identify exposure pathways and receptors; (2) Screen for chemicals of potential interest; (3) Evaluate fate and transport information and the potential for intrinsic remediation; (4) Estimate exposure point concentrations; and (5) Estimate the upper bound on possible risks to human receptors.

*how about  
actual  
field  
measurement.*

Generally, intrinsic remediation of chlorinated solvent sites has been accepted by the RWQCB in cases where groundwater quality is poor (i.e., meets the SWRCB Resolution 88-63 definition of non-potable water supply) and several site-specific conditions exist, such as these:

- The source area has been removed/remediated.
- Degradation products are present in groundwater.
- Decreases in parent VOC compound concentrations are comparable (on a mass balance basis) to increases in concentrations of byproducts of the VOC breakdown.
- Geochemical conditions at the site (i.e. anaerobic, low oxygen) support solvent breakdown.
- The VOC plume is stable or decreasing in concentration, especially at the edges of the plume.

Following collection of the site investigation data, and if health risk calculations indicate exceedences of PRGs, an evaluation of the fate and transport conditions at the site and the prospects for intrinsic remediation of the VOCs will be prepared in support of the human health risk assessment.

## RISK MANAGEMENT EVALUATION

Based on the results of the human health evaluation and the qualitative evaluation of intrinsic remediation, an assessment of future action that should be taken to address risk will be prepared. Until the offsite data is available and reviewed, it is premature to speculate what types of actions might be recommended.

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**REPORTING**

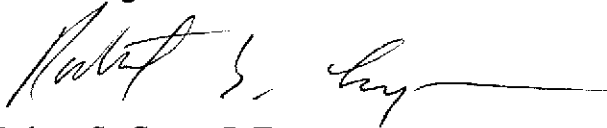
A Risk Management Report for the site will be prepared that documents the results of the data collection and evaluation tasks outlined above. The target date for submittal of the Risk Management Report to the RWQCB and ACHCSA is January 10, 1997.

Yours very truly,

**PES ENVIRONMENTAL, INC.**



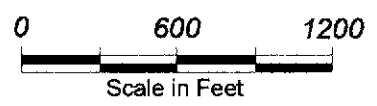
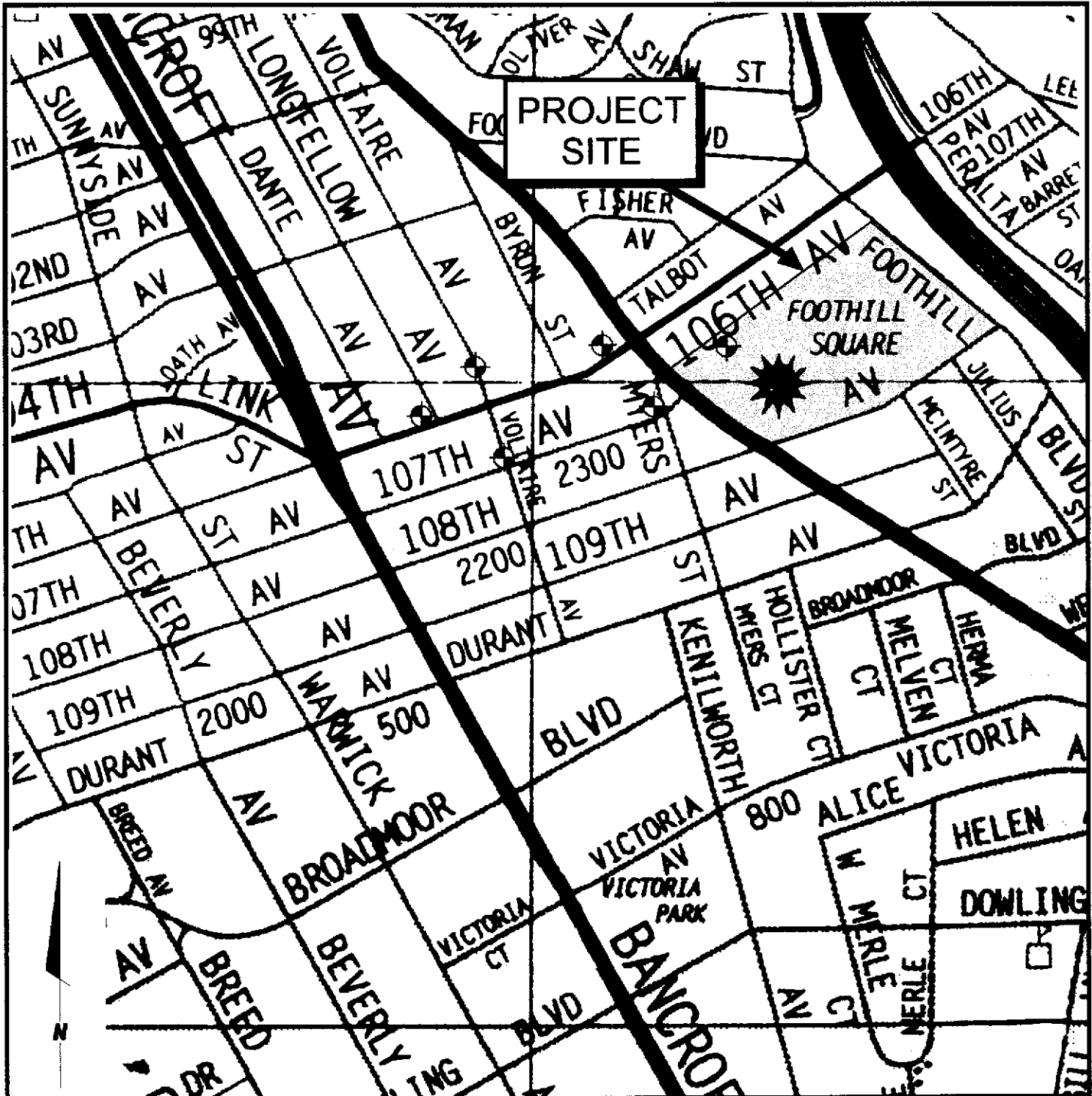
William W. Mast R.G.  
Senior Engineer



Robert S. Creps, P.E.  
Principal Engineer

Attachment: Plate 1

cc: Mr. Richard Gilcrease, Drake Builders  
Mr. David Cooke, Esq., Beveridge & Diamond



 Proposed Preliminary Groundwater Sampling Location

Ref: The Thomas Brothers Guide, Alameda County, 1997

 **PES Environmental, Inc.**  
Engineering & Environmental Services

**Site Location Map**  
Risk Management Workplan  
Foothill Square Shopping Center  
Oakland, California

PLATE  
**1**

502.0101.001  
JOB NUMBER

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DRAWING NUMBER

*Al Mast*  
REVIEWED BY

12/96  
DATE