PES Environmental, Inc.
Engineering & Environmental Services

August 29, 2001

167.002.01.008

Greater Bay Trust Company
Hanson, Bridgett, Marcus, Vlahos & Rudy
333 Market Street, Suite 2300
San Francisco, California 94105-2173

SEP 04 2001

Attention: Rory Campbell, Esq.

WORKPLAN
MONITORING WELL INSTALLATION,
RESUMPTION OF ENHANCED BIO-REMEDIATION, AND
RESUMPTION OF QUARTERLY SAMPLING
FORMER COX CADILLAC FACILITY
230 BAY PLACE
OAKLAND, CALIFORNIA

Dear Mr. Campbell

PES Environmental, Inc. (PES) presents this workplan to install one groundwater monitoring well, and resume enhanced bio-remediation and groundwater monitoring at the former Cox Cadillac facility, located in Oakland, California (the "Site")(Plate 1). The workplan has been completed on behalf of Greater Bay Trust Company, trustee for the Robert Shepard Trust, Brian F. Shepard Trust, Douglas C. Shepard Trust, and the Lisa C. Shepard Trust, the former owners of the property. This workplan is submitted in response to the April 6, 2001 letter from Alameda County Environmental Health Services (ACEHS). A copy of the letter is attached in the Appendix. This workplan presents: (1) a description of the project background; (2) an evaluation of cleanup objectives; (3) a description of the proposed well location and installation methods; (4) procedures for performing bio-remediation; (5) procedures for groundwater monitoring; and (6) a summary of data evaluation and reporting.

1.0 BACKGROUND INFORMATION

The nearly two-acre Bill Cox Cadillac facility is bounded on the northwest by Harrison Street, on the southwest by Bay Street, and on the southeast by Vernon Street (Plate 2). The facility has most recently been used for automobile sales and services, including automobile sales, storage, maintenance, repair and painting. Onsite activities have also included use and storage of fuels, oils, greases, paint, thinners, and petroleum solvents. The facility presently contains an approximately 30,000 square feet vacant building. Approximately 6,500 square feet of the building was used as a sales showroom and offices, while the remainder of the building was used for automobile storage, body work and painting, as well as an indoor service area. The remaining areas of the site are asphalt-covered parking areas.

A 3,000-gallon waste oil storage tank was removed in December 1988. One groundwater monitoring well (Well MW-1) and seven temporary monitoring wells (Wells TW-1 through TW-7) were installed at the site by PES to investigate subsurface conditions in the vicinity of the former waste oil tank. MW-1 was installed in February 1993 down gradient of the former waste oil tank and a groundwater sample was collected from it in March 1993. Elevated concentrations of total petroleum hydrocarbons quantified as gasoline (TPHg) were detected in the sample analyzed from Well MW-1 at that time. Gasoline detected in groundwater was characterized as "fresh" and no waste oil constituents were detected. Temporary wells, Wells TW-1 through TW-7 were subsequently installed in March 1993 to investigate the degree and extent, and the likely source of the gasoline contamination in groundwater. Results of the additional investigation indicated that elevated TPHg and benzene, toluene, ethylbenzene, and total xylenes (BTEX) were detected in groundwater samples from four of the temporary wells and in Well MW-1. MTBE was not detected in the samples. The highest concentrations of petroleum hydrocarbon constituents were detected in groundwater samples from two wells (TW-5 and TW-7) closest to a 10,000-gallon underground gasoline tank and associated product piping located to the west of the former waste oil tank. The results of the investigations were presented in PES' report, *Soil and Groundwater Investigation, Bill Cox Cadillac, 230 Bay Place, Oakland, California* dated December 23, 1993. The well locations and former waste oil tank location are shown on Plate 2.

The 10,000-gallon underground gasoline tank and product piping were removed on behalf of Bill Cox Cadillac by DECON Environmental Services of Hayward, California under the direction of Eisenberg, Olivieri & Associates (EOA) of Oakland, California in January 1994. During removal, a hole was observed in the product piping between the tank and dispenser. Floating free-phase product was observed on the groundwater surface in the tank excavation. EOA subsequently performed limited investigations to evaluate the offsite extent of gasoline contamination. EOA performed quarterly groundwater monitoring of wells MW-1, TW-2, TW-6 and TW-7 between December 1994 and February 1996.

Soil and groundwater remediation was subsequently requested by ACEHS in a letter to the Harold Shepard Trust dated October 24, 1996. In the letter, ACEHS specified that soil remediation consisting of excavation of hydrocarbon-affected soil, and groundwater remediation consisting of oxygen introduction was required. In response to that request, PES developed a remedial plan that included the following: *Revised Interim Remedial Action Plan* (IRAP) dated October 31, 1996 and *Addendum, Revised Interim Remedial Action Plan* dated November 26, 1996. As part of the Remedial Plan, site characterization, well installation, soil remediation, baseline groundwater monitoring, and initial groundwater remediation were conducted by PES between June 1997 and April 1999. The results of work conducted between June 1997 and April 1999 were previously submitted to ACEHS in PES' report, *Site Characterization and Interim Remedial Actions, Former Cox Cadillac Facility, Oakland, California,* dated September 30, 1999.

A 1-year pilot program was conducted between January 1999 and January 2000 to evaluate possible enhanced in-situ remediation of groundwater by applying a combination of in-situ bio-remediation methods, which introduced oxygen and nutrients into groundwater at the site to enhance natural biodegradation rates of petroleum hydrocarbons. The methods included: (1) adding nutrient- and hydrogen peroxide-enriched water (hereinafter referred to as enriched water); and (2) placement of Oxygen Releasing Compound (ORC) in selected wells at the site. Groundwater and bio-remediation monitoring reports presenting the results of enriched water introduction and quarterly monitoring conducted in April, July, and October 1999, and January 2000 were prepared by PES and submitted to ACEHS. The bio-remediation pilot program was completed in December 2000. Quarterly monitoring was resumed in April 2001. The results of the monitoring event are presented in PES' report *Quarterly Groundwater Monitoring, April 2001 Quarterly Event, Former Cox Cadillac Facility, Oakland, California,* dated July 16, 2001.

TPHg and MTBE concentrations decreased in wells MW-2 and TW-7 while increases of TPHg, MTBE and BTEX concentrations in well MW-1 were observed from samples taken in April 2001 as compared to January 2000. Prior monitoring indicated that the enhanced bio-remediation program had been effective in reducing hydrocarbon concentrations in groundwater from well MW-1. No concentration rebound was noted in groundwater samples from well TW-6, the other well where enhanced biodegradation appeared to be effective during the 1999-2000 pilot study. The lack of rebound likely indicates that biodegradation of contaminants in groundwater in the immediate vicinity of well TW-6 is complete. Consistent with historical findings, the highest concentrations of petroleum hydrocarbons were detected in the groundwater from wells nearest to the former gasoline UST and product piping, specifically Wells MW-1 and TW-7.

Results of the April 6, 2001 groundwater elevations indicate a hydraulic gradient of approximately 0.04-foot per foot. The estimated groundwater flow direction continues to be toward the southwest, which is consistent with historical data from the site.

2.0 GROUNDWATER CLEANUP OBJECTIVES

The objective of resuming enhanced bio-remediation of groundwater is to reduce the concentrations of petroleum hydrocarbons in groundwater to acceptable risk levels for the planned and possible future use of the site. PES proposes adoption of remedial goals for the site based on the City of Oakland Risk-Based Corrective Action (RBCA), by applying Oakland-specific Tier 2 site-specific target levels (SSTLs).

Previously reported soil and groundwater data has been presented in PES' report *Site Characterization and Interim Remedial Actions*, dated September 30, 1999 and EOA's *Report of Soil Excavation and Disposal Activities,* dated September 19, 1994. PES has evaluated the previous data in relation to the Oakland RBCA and identified that the project site is eligible for

using the Oakland-specific risk levels as the cleanup goals for BTEX and MTBE. Table 1 presents the RBCA Tier 2 SSTLs for BTEX and MTBE in subsurface soil and groundwater. The SSTLs are for sandy silt soil conditions that are representative of the soil type encountered at the site. Residual concentrations of BTEX and MTBE in soil after the tank excavation and soil remediation are all below the soil SSTLs. Consequently, no further action with respect to soil is warranted. In groundwater, the concentration of benzene in wells MW-1 and TW-7 exceeds the commercial/industrial SSTL of 38 milligrams per liter (mg/L).

3.0 PROPOSED SCOPE OF WORK

The purpose of the proposed well is to provide additional hydrogeologic data to assess the lateral extent of hydrocarbon affected groundwater in the site vicinity. PES will also resume enhanced bio-remediation to reduce concentrations of petroleum hydrocarbons in groundwater.

3.1 Pre-field Activities

Prior to conducting field activities, PES will update the existing site-specific Health and Safety Plan. The Health and Safety Plan will comply with applicable federal and California Occupational Safety and Health Administration (OSHA) guidelines. PES will also obtain a well permit from ACEHS and an encroachment permit for locating the well along Bay Place from the City of Oakland.

Prior to drilling, PES will retain a private underground utility locating service to conduct a subsurface electromagnetic survey to clear the proposed sampling location of subsurface utilities. Underground Service Alert (USA) will also be contacted to schedule visits by public and private utility companies.

3.2 Well Installation, Development and Sampling

One new groundwater monitoring well will be installed between existing well TW-7 and the intersection of Bay Place and Harrison Street on the western side of the site. The proposed monitoring well location is shown on Plate 3. The construction completion details, including total depth and screened interval, will be determined based on geologic conditions encountered during field activities and shall be consistent with previous well completions.

The monitoring well will be installed by a State-licensed drilling contractor. The first four feet of the monitoring well boring will be drilled using a hand auger to verify that no underground utilities are present at the drilling location. The well boring will be drilled using a truck-mounted drill rig equipped with 8-inch outside-diameter hollow-stem augers. Soil samples will be collected every 5 feet to document lithology and subsurface conditions. Samples will be collected by driving a modified California split-spoon sampler (lined with three, 6-inch long stainless-steel liners) approximately 18 inches into undisturbed soil. The soil lithology will be

logged from cuttings and from samples in accordance with the Unified Soil Classification System (USCS) under the supervision of a California-registered geologist or registered engineer. The soil samples will be field-screened for the presence of volatile organics by placing the soil in zip-lock plastic bags and evaluating the head-space with a portable organic vapor meter (OVM). The results of the field screening will be used to assist in selection of samples for laboratory analyses.

Groundwater is expected to be encountered at a depth of approximately 4 to 6 feet below ground surface (bgs). The soil boring will be advanced to a depth of approximately 20 feet below ground surface. The well will be constructed using 2-inch diameter, flush-threaded PVC casing and 0.020-inch machine slotted well screen, so that the top of the screen extends at least 2 feet above the seasonal groundwater high at the site. The annular space will be filled with #3 graded filter-pack across the screened interval and 6 inches above the screen. Blank PVC casing will be placed from the screened interval to ground surface. An approximately 6-inch seal of hydrated bentonite will be placed in the annular space above the sand-pack. A concrete and bentonite grout will be placed from the top of the bentonite seal to ground surface. A below-grade utility box will be set in concrete slightly above ground surface to protect the monitoring well. The concrete shall be sloped to drain surface water away from the well.

Following monitoring well installation, the well will be developed to sort the sand pack and remove fines from the well bore. Development will be performed by surging and/or bailing followed by pumping until discharge is visually clear and free of sediment, and at least 6 to 10 well volumes of water have been removed, if possible. Development discharge water will be monitored for pH, temperature, and electrical conductivity during development. Development equipment will be cleaned prior to use in each well. Development water will be collected in labeled Department of Transportation (DOT)-approved 55-gallon steel drums and stored at the site until appropriate disposal arrangements are made.

At least 24 hours following well development, a groundwater sample will be collected from the monitoring well. Water level measurements will be conducted prior to sample collection. Field parameters such as pH, electrical conductivity, turbidity, and temperature will be monitored. A minimum of three-well volumes of water will be removed or until the field parameters have stabilized. Groundwater samples will then be collected using a clean Teflon or stainless steel bailer. The sample will be transferred to the appropriate sample containers. The sample containers will be filled slowly to minimize sample volatilization and ensure that the sample is free of air bubbles. The sample containers will be labeled, placed in a thermally insulated cooler, and transported under chain-of-custody protocol to a state-certified laboratory for analysis.

Based on results of previous grab groundwater sampling, the groundwater monitoring well samples collected during the first round of well sampling will be analyzed for TPHg using EPA Test Method 8015-modified, BTEX and MTBE using EPA Test Method 8020. The

analytical program for subsequent well sampling events will be determined based on results of the first round of sampling.

3.3 Resumption of Enhanced Bio-Remediation

3.3.1 Bacterial Augmentation

PES will prepare a culture of hydrocarbon-degrading bacteria that will be introduced to the groundwater at the site for augmenting the current bacterial population. Groundwater samples will be collected from three onsite wells for submittal to a microbiologist for laboratory analyses. The samples will be analyzed for total bacteria enumeration, hydrocarbon utilizer enumeration, ammonia nitrogen, o-phosphate phosphorus and pH. The microbiologist will interpret the laboratory results and recommend an appropriate batch culture to introduce at the site.

A batch culture will be prepared using groundwater pumped from wells at the site to a holding tank. Based on the sample results, the microbiology lab will recommend appropriate nutrients (ammonia and phosphate) and provide a culture of bacteria for adding to the water tank to prepare the batch culture. The batch culture will be aerated to add oxygen and warmed to enhance microbial growth. Between approximately two and four days, the batch will appear opaque with suspended bacteria and ready for use. The batch culture will then be introduced to selected wells at the site.

3.3.2 Nutrient Introduction

Nutrient introduction will be conduced twice each quarter for the shorter of 4 years (32 events) or until the cleanup objectives are met. An oxygen source in the form of a solution of potable water, hydrogen peroxide and a blend of micronutrients (enriched water) will be prepared and introduced twice each quarter into wells MW-1, TW-4, TW-5, and TW-7, to stimulate natural biodegradation of the hydrocarbons.

PES will obtain a fire hydrant meter permit from East Bay Municipal Utility District to provide water to the site for the nutrient introductions.

The enriched water will be prepared in a tank by combining hydrogen peroxide, potable water and small quantities of nitrogen and phosphorus nutrients. A centrifugal pump, valves, flow meters and pipeline delivery system will be attached to the mixing tank to allow controlled addition of enriched water to the designated wells.

The nutrient amendment will be mixed at a concentration to maximize oxygen delivery and prevent accumulation of biomass in the immediate vicinity of the wells while reducing the potential for precipitation of inorganic carbonates. The anticipated volume of enriched water to be prepared and a volume of approximately 900 gallons per event will be introduced into the

wells at an initial concentration of 500 parts per million (ppm) hydrogen peroxide. Hydrogen peroxide concentrations will be incrementally increased during subsequent enriched water applications until it reaches a concentration of 1,000 to 1,500 ppm hydrogen peroxide. This delivery program is intended to result in a concentration of hydrogen peroxide which will inhibit biological activity in the immediate vicinity of the wells to prevent plugging of the well screen by biomass. Higher concentrations of hydrogen peroxide in the well may result in precipitation of carbonates and plugging of the well screen. Application rates and concentrations may be adjusted as necessary to minimize mounding of the groundwater and well plugging and to maximize oxygen delivery.

Following enriched water introduction, ORC Filter Socks will be installed in each of the five designated wells. The ORC Filter Socks will provide continuous supply of oxygen between enriched water introductions. The ORC Filter Socks will be replaced when they no longer maintain elevated dissolved oxygen concentrations. PES estimates that the ORC will be replaced after approximately six months of use.

To monitor the progress of the bio-remediation and effectiveness of nutrient delivery, the concentration of dissolved oxygen will be measured in wells MW-1, MW-2, TW-2, TW-4, TW-5, TW-6, and TW-7 prior to and following each nutrient introduction event. Total dissolved oxygen will be measured at the start of the day before introduction of enriched water and at the end of the day after introducing enriched water.

3.4 Quarterly Monitoring

Quarterly groundwater monitoring at the site will be conducted to evaluate environmental conditions and monitor the progress of the remedial program until cleanup objectives are met. Water levels and dissolved oxygen concentrations in all the wells will be measured before quarterly groundwater sampling events. Water level measurements will be converted to water-level elevations to evaluate groundwater gradient. Water-level measurements will be obtained using an electronic water-level sounder.

Prior to sampling each well, a minimum of three well volumes will be purged using a clean stainless steel bailer, bladder pump, or Teflon bailer. During purging, the discharge water will be monitored for pH, temperature, and electrical conductivity. Once the water quality parameters have stabilized, groundwater samples will be collected using a Teflon bailer.

Monitoring wells TW-2, TW-6, TW-7, MW-1 and MW-2 and the new well will be purged and sampled quarterly and samples submitted to a California-certified analytical laboratory under chain-of-custody procedures. Samples will be analyzed for TPHg by EPA Test Method 8015 modified and BTEX and MTBE by EPA Test Method 8020. The highest detection of MTBE will be quantified by EPA Test Method 8260B. The samples will be analyzed on a standard 10-day turnaround time.

In addition to recording the groundwater quality parameters, PES will monitor parameters related to the progress of the bio-remediation. To monitor the progress of the bio-remediation and effectiveness of nutrient delivery, the concentration of dissolved oxygen will be measured in all the wells during quarterly groundwater monitoring and prior to and following each nutrient delivery event. Dissolved oxygen is an indirect indicator of hydrocarbon concentration. In areas of high hydrocarbon concentration, dissolved oxygen is consumed by the native bacteria and residual dissolved oxygen concentrations are expected to be low. Conversely, effective nutrient addition will be demonstrated by elevated concentrations of dissolved oxygen in the monitoring wells.

3.5 Reporting

Upon receipt of analytical data, a groundwater monitoring well installation and sampling report will be prepared. This report will describe: (1) field methods and procedures used in groundwater monitoring well installation, development and sampling; (2) the results of the groundwater sampling; (3) enhanced bio-remediation activities and quarterly monitoring; and (4) data evaluation, conclusions and recommendations. In addition to the well installation report, PES will produce quarterly groundwater monitoring and bio-remediation progess reports. The quarterly reports will include an evaluation of the bio-remediation program monitoring results and will identify potential adjustments to the program in an effort to optimize bio-remediation effectiveness.

We trust this workplan provides you with the information required at this time and meets with your approval. If you have any questions or require additional information, please call either of the undersigned.

Very truly yours,

PES ENVIRONMENTAL, INC.

François A. Bush
Senior Geologist

Andrew A. Briefer, P.E.
Principal Engineer

Attachments: Table 1 – Oakland RBCA Tier 2 SSTLs
Plate 1 – Site Location Map
Plate 2 – Site Plan and Well Location Map
Plate 3 – Proposed Monitoring Well Location

cc: Ms. Cheryl Howell – Greater Bay Trust Company
Mr. Don Huang – Alameda County Environmental Health Services
Mr. Mark Owens – California UST Cleanup Fund
Mr. Chuck Pardini - LFR

REFERENCES

EOA 1994. *Report of Soil Excavation and Disposal Activities, 230 Bay Place, Oakland, California,* September 19.

PES, 1993. *Soil and Groundwater Investigation, Bill Cox Cadillac, 230 Bay Place, Oakland, California,* December 23.

PES, 1996. *Revised Interim Remedial Action Plan, Former Bill Cox Cadillac, 230 Bay Place, Oakland, California,* October 31.

PES, 1996. *Addendum, Revised Interim Remedial Action Plan, Former Bill Cox Cadillac, 230 Bay Place, Oakland, California,* November 26.

PES, 1999. *Site Characterization and Interim Remedial Actions, Former Cox Cadillac Facility, 230 Bay Place, Oakland, California,* dated September 30.

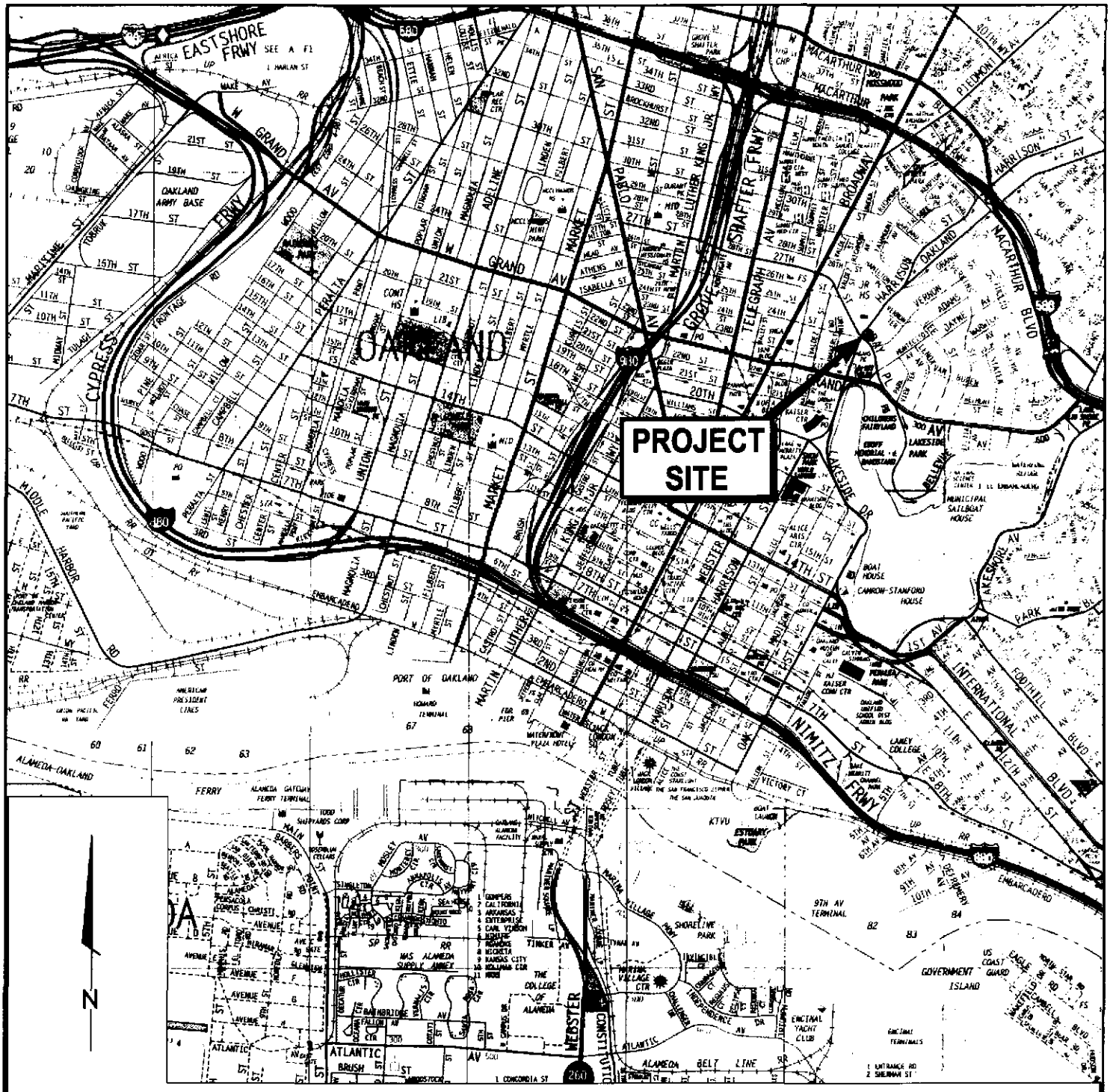
PES, 2001. *Quarterly Groundwater Monitoring, April 2001 Quarterly Event, Former Cox Cadillac Facility, 230 Bay Place, Oakland, California,* July 16.

Table 1
Oakland Risk-Based Corrective Action
Tier 2 Site Specific Target Levels (SSTLs)
Former Cox Cadillac
230 Bay Place
Oakland, California

Medium	Exposure Pathway	Land Use	Type of Risk	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
Subsurface Soil (mg/kg)	Inhalation of Indoor Air Vapors	Residential	Carcinogenic	1.1				
			Hazard	3.6	SAT	SAT	SAT	8,000
		Commercial/Industrial	Carcinogenic	1.7				
			Hazard	100	SAT	SAT	SAT	SAT
Groundwater (mg/L)	Inhalation of Indoor Air Vapors	Residential	Carcinogenic	2.4				
			Hazard	7.9	>Sol	>Sol	>Sol	26,000
		Commercial/Industrial	Carcinogenic	38				
			Hazard	230	>Sol	>Sol	>Sol	>Sol

Notes:

MTBE - Methyl tertiary butyl ether
mg/kg - Milligrams per kilogram
mg/l - Milligrams per liter
SAT - SSTL exceeds saturated soil concentration of chemical
>SOL - SSTL exceed solubility of chemical in water
Hazard - non-carcinogenic



Ref: "The Thomas Guide- Alameda/Contra Costa Counties Street Guide and Directory" 1998 Edition

PES Environmental, Inc.
Engineering & Environmental Services

Site Location Map
Former Cox Cadillac-230 Bay Place
Oakland, California

PLATE 1

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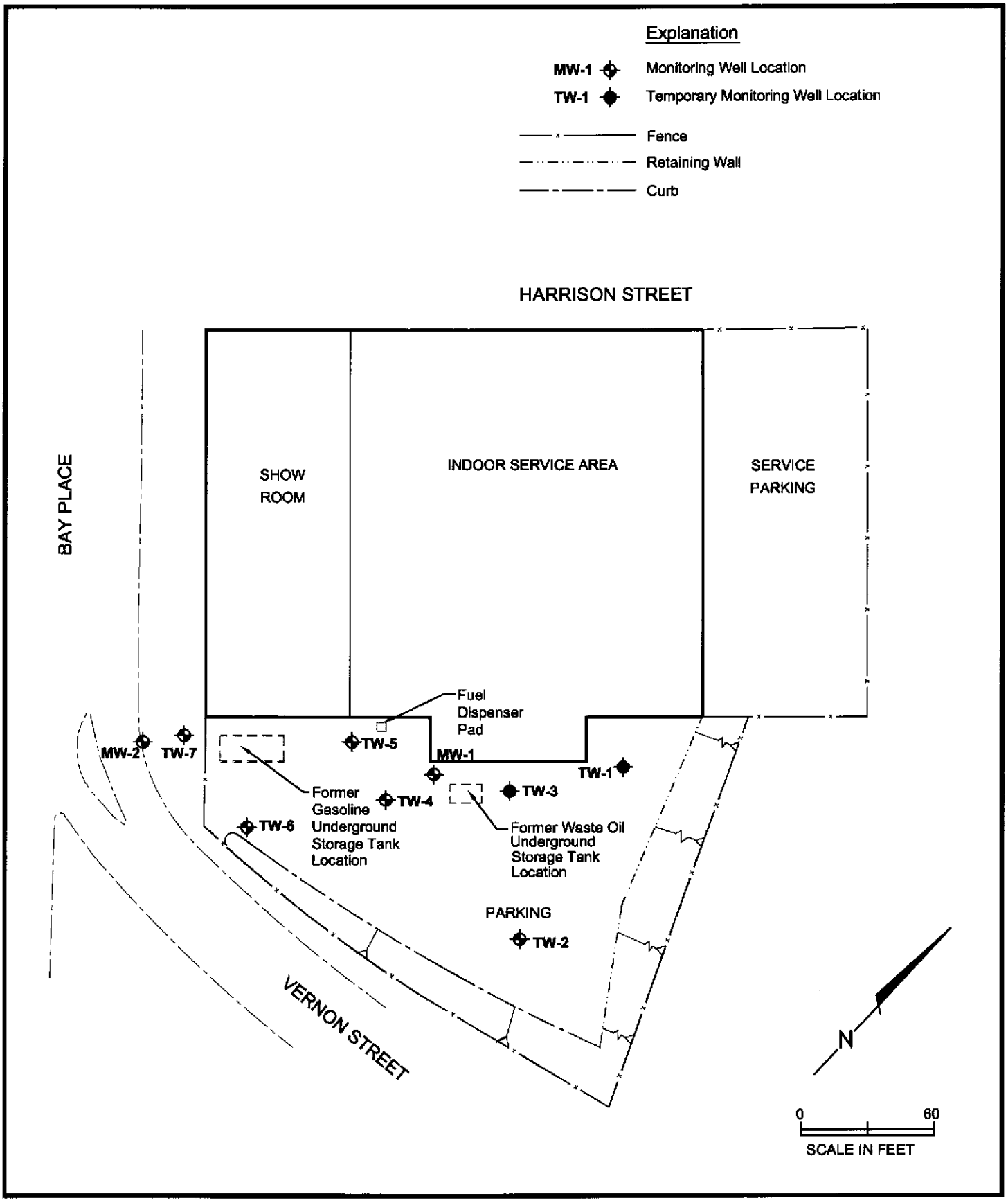

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Site Plan and Well Location Map
Former Cox Cadillac-230 Bay Place
Oakland, California

PLATE
2

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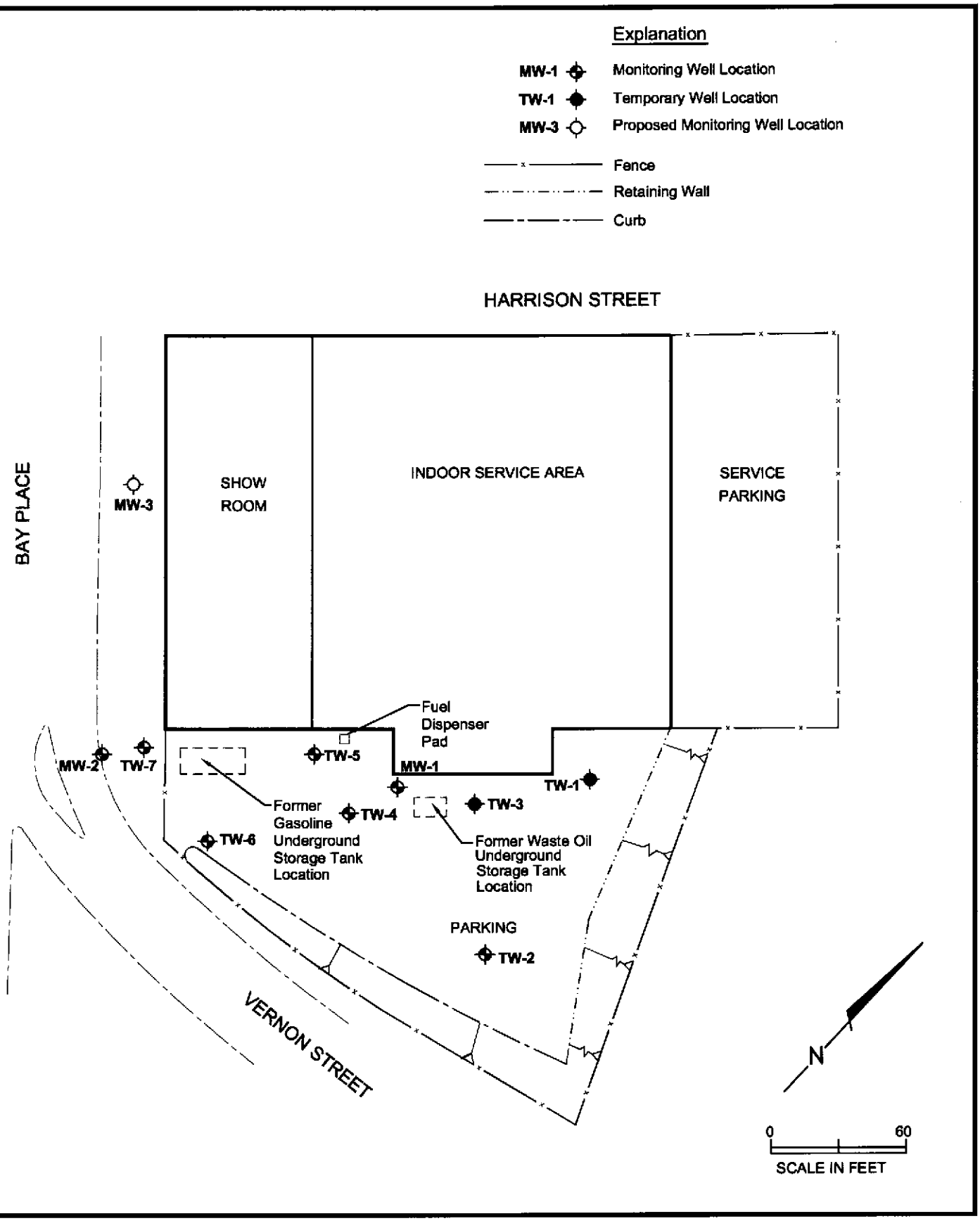

PES Environmental, Inc.
Engineering & Environmental Services

Site Plan and Proposed Well Location
Former Cox Cadillac-230 Bay Place
Oakland, California

PLATE 3

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ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

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April 6, 2001

Greater Bay Trust Co.
C/o Leah S. Goldberg, Esq.
Hanson, Bridgett, Marcus, Vlahos & Rudy
333 Market St., Suite 2300
San Francisco, CA 94105-2173

Dear Ms. Goldberg:

Subject: Former Cox Cadillac, 230 Bay Pl., Oakland, CA
StId 494

"Transmittal, Quarterly Groundwater Monitoring and Year-End Bio-Remediation Evaluation Report & Recommendations, ..." and "Quarterly Groundwater Monitoring and Year-End Bio-Remediation Evaluation Report & Recommendations, ..., May 24, 2000" by PES Environmental, Inc., were reviewed. 1) We concur with the recommendation to continue groundwater monitoring using the existing wells. 2) The other recommendation is the installation of an offsite well between TW-7 and the intersection of Bay Place and Harrison Street to assess if offsite sources are migrating toward the site. We believe sampling of the trenches may indicate if the trenches are being used as pathways. However, an explanation is needed for how the installation of a well at the location suggested is indicative of an offsite source, and whether additional sampling of the trenches is required to make this determination, and also if the trenches are intercepting the onsite plume. 3) Additionally, Andy Briefer, PES Environmental, Inc., stated that he wished to try bioremediation again at monitoring wells MW-2 and TW-7 but instead use bacterial cultures from the other monitoring wells. We would need to evaluate documentation which demonstrates that this approach could be feasible for monitoring wells MW-2 and TW-7. Previously, bio-remediation using enriched water and ORC was tried at these wells but the groundwater contaminant concentrations did not decrease and the concentrations have in fact increased in MW-2 since the introduction of enriched water in March 1999.

A workplan must be submitted for sampling of the trenches and bioremediation of monitoring wells MW-2 and TW-7.

If you have any questions, I may be reached at (510) 567-6746.

Sincerely,

Don Hwang
Hazardous Materials Specialist

C: Andy Briefer, PES Environmental, Inc., 1682 Novato Blvd., Suite 100, Novato, CA 94947

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