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Environmental Health

September 12, 2008

Alameda County
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Attention: Barbara J. Jakub, P.G., Hazardous Materials Specialist

Subject: Post Remediation Evaluation Work-plan, Former Ambassador Laundry, Emeryville, California, Fuel Leak Case No. RO0002973

Dear Ms. Jakub

The City of Emeryville has prepared the enclosed Post Remediation Evaluation Work-plan Former Ambassador Laundry Emeryville, California in response to concerns and your requests stated in your letter, , dated July 7, 2008.

The information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge.

If you have any questions or comments on the work plan please contact Álvaro Domínguez at 510-628-9000 x 202, or my self at (510)596-4356.

Sincerely,

Ignacio Dayrit
Project Manager

POST REMEDIATION EVALUATION WORK PLAN
FORMER AMBASSADOR LAUNDRY
EMERYVILLE, CALIFORNIA

September 12, 2008

A Site Investigation Work Plan Prepared for:

Ignacio Dayrit
City of Emeryville
1333 Park Avenue
Emeryville, California

POST REMEDIATION EVALUATION WORKPLAN
FORMER AMBASSADOR LAUNDRY
EMERYVILLE, CALIFORNIA

File No.: 73943/PW-Wplan

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September 12, 2008

TABLE OF CONTENTS

PLATES

1.0 INTRODUCTION

Kleinfelder prepared this work plan on behalf of the City of Emeryville (the City) to perform a subsurface investigation at the property located at 3601-3623 Adeline Street in Emeryville, California; the former Ambassador Laundry (the Site) to assess post remediation conditions at the Site. Plate 1 presents a Site vicinity map. The City is interested in facilitating the development of the 'Ambassador Housing' residential complex at the Site. The Ambassador Housing project is designed to have most of its surface paved. The housing building structure will be located on a second story, above the parking area on the ground level. This work plan was prepared in response to the Alameda County Environmental Health Services (ACEHS) letter, dated July 7, 2008, and the conversation held with the ACEHS case officer Barbara Jakub on July 17, 2008.

The objectives of this work plan are to describe the investigation work proposed to evaluate the adequacy of the remedial measures implemented in 2007 during the removal of an underground storage tank (UST) for heating oil, and address the ACEHS requirements to further assess the Site's subsurface condition, including the monitoring of groundwater gradient and groundwater quality at the Site. Implementation of this work plan will 1) assist in confirming that the completed remedial actions were adequate, 2) assess if current subsurface conditions are conducive for natural attenuation of the chemicals of concern (COC) identified at the Site, and 3) help evaluate the need to implement more aggressive remediation measures to facilitate the residential development project at the Site. The proposed investigation work includes:

- Advancing seven borings for soil sample collection to further assess the horizontal and vertical extent of petroleum impacted soil associated with the sump, removed in 2005, and the UST, removed in 2007;
- Installing six groundwater monitoring wells to establish the hydraulic gradient and flow direction of groundwater at the Site,
- Conduct groundwater monitoring to assess groundwater quality for at least three quarters;
- Professionally surveying the wells;

- Uploading the Site's information into the GeoTracker database system.
- Obtaining information on the location, status and construction of water wells and underground utilities within a 2,000-foot radius of the Site that may serve as preferential pathways for petroleum hydrocarbons in groundwater.

The results of the proposed investigation, including the quarterly groundwater monitoring, will be used to 1) delineate the horizontal and vertical extent and magnitude of the COC identified at the Site, 2) assess the potential for natural attenuation of COCs at the Site's subsurface, and 3) assess the need to implement active remediation measures to facilitate the proposed development of the Site.

2.0 BACKGROUND INFORMATION

This section presents a description of the Site and a summary of previous investigations.

2.1 SITE DESCRIPTION

The U-shaped Site occupies approximately 34,136 square feet (0.78-acres) in a mixed residential/light industrial land-use area of the City of Emeryville. Currently, the Site is a vacant lot with a billboard facing the west-bound traffic of Interstate 580. The Site formerly consisted of three building structures that included a two-story masonry building (1168 36th Street) with additions towards the east; a residential building with a single car garage (1160 36th Street); and a residential structure (3601 Adeline Street). The eastern portion of the Site (3623 Adeline Street) was an open paved yard associated with two garage/shops that were attached to the main buildings. All onsite structures were demolished in August 2005 (Clayton 2005).

2.2 OPERATIONAL HISTORY

An industrial laundry facility operated at the Site between 1910 and the 1980s and may have included the storage and handling of chemicals, such as solvents, spot removers, and other unknown products. According to the Phase I Environmental Site Assessment (ESA) (Clayton 2003a), the land use at the Site changed in the mid 1980s, becoming a multi-tenant, mixed residential/commercial land-use area. Businesses operating at the Site included a spa assembly, a commercial sign company, art studios, a bronze art foundry, a metal contractor, vehicle maintenance, and other commercial uses.

2.3 PREVIOUS INVESTIGATIONS/REGULATORY INVOLVEMENT

Kleinfelder reviewed copies of available environmental investigation reports on the Ambassador Laundry Site, most of which are summarized in the Phase 1 ESA prepared by Clayton (Clayton 2003a). Previous environmental work at the Site included:

- The removal of one UST for gasoline (1994) and one heating oil UST (1995);
- Soil and groundwater investigations associated with the removal of the USTs;

- The cleaning of Sump-1 in 1999;
- A subsurface investigation to assess the potential impacts associated with the UST for heating oil (Kleinfelder, 1996a);
- A groundwater sampling and case closure request (Kleinfelder, 1996b);
- A Phase I ESA (Clayton 2003a),
- A soil and groundwater sampling investigation (Clayton 2003b),
- A wooden sump (Sump-2) closure report (Clayton 2005), and
- A subsurface investigation and UST removal (Kleinfelder, 2008).

Plate 2 shows the approximate location of previous UST and sump removal locations and subsurface investigation sampling locations.

In 2005, during the removal of Sump-2, an unidentified UST was encountered at the southeastern corner of the excavation, at approximately nine feet below ground surface (bgs). The unidentified UST was left in place for future removal (Clayton, 2005). In 2007, Kleinfelder was retained by the City to perform additional subsurface investigations at the Site and remove the recently discovered UST. Activities performed by Kleinfelder included:

1) Conducting a geophysical survey of the Site;
2) Collecting and analyzing soil vapor samples for volatile organic compounds (VOCs);
3) Removing the unidentified UST;
4) Collecting confirmation soil samples from the former hydraulic freight elevator and existing electrical transformers areas; and
5) Performing a soil and groundwater investigation.

Fieldwork and analytical results from these activities are summarized in the Subsurface Investigation Underground Storage Tank Removal and Remediation Report (Kleinfelder 2008). For environmental screening purposes, chemicals reported at concentrations above the laboratory's reporting limit (RL) during the 2007 subsurface investigation were compared to the San Francisco Bay Regional Water Control Board's (SFBRWQCB) environmental screening levels (ESLs) for residential land use where groundwater is not a potential source of drinking water (SFBRWQCB 2007). A brief summary of Kleinfelder's 2007 investigation is presented below.

2.3.1 Geophysical Survey

This survey identified the location of the unidentified UST, as well as excavation disturbances corresponding to the locations of the previously removed gasoline UST (1994) and Sump-2 (2005).

2.3.2 Soil Vapor Investigation

The soil vapor investigation indicated the presence of 19 VOCs at concentrations above the laboratory's reporting limit (RL), but none at concentrations exceeding their respective ESLs.

2.3.3 UST Removal and Over Excavation

The bottom and sidewalls of the pit excavated to remove the unidentified UST, particularly the western wall, were noticeably impacted with petroleum hydrocarbons. Photo-ionization detector (PID) readings of up to 600 parts per million (ppm) were recorded. Visibly impacted soil was removed as a remediation measure, primarily from the bottom and western sidewalls of the excavation. A maximum depth of approximately 14 feet bgs was reached. A total of approximately 100 cubic yards of soil was excavated and appropriately disposed after being characterized. No groundwater was encountered. VOCs and semi-volatile organic compounds (SVOCs) were not reported at or above the laboratory's RL or above their respective ESLs in soil confirmation samples collected from the sidewalls and bottom of the excavation. Except for total petroleum hydrocarbons as diesel (TPH-d), reported as high as 774 milligrams per Kilogram (mg/Kg) in the northern wall of the excavation, petroleum hydrocarbon concentrations were below their respective ESLs.

2.3.4 Former Hydraulic Freight Elevator and Electrical Transformer Area

In these two areas, total petroleum hydrocarbons as motor oil (TPH-mo) and/or polychlorinated biphenyls were not reported at or above the laboratory's RL or above their respective ESLs.

2.3.5 Soil and Groundwater Investigation

In soil, no VOCs, total petroleum hydrocarbons as gasoline (TPH-g), TPH-d, and TPH-mo were reported at or above the laboratory's RL or their respective ESLs. In groundwater, VOC and SVOC concentrations were below their respective ESLs, except for toluene and ethylbenzene in the groundwater sample collected from boring KB-9 at maximum concentrations of 598 micrograms per liter (µg/L) and 604-µg/L, respectively. The ESLs for toluene and ethylbenzene in groundwater are 400-µg/L and 300-µg/L, respectively. TPH-g concentrations above the ESL of 5 milligrams per Liter (mg/L) were reported in samples from two boring locations, KB-7 (5.7 mg/L) and KB-9 (10 mg/L). Concentrations of TPH-d and TPH-mo exceeding their respective ESLs (5 mg/L) were reported in the sample collected from location KB-8, at 22.1 mg/L (TPH-d) and 53.7 mg/L (TPH-mo). Total petroleum hydrocarbons as Stoddard Solvent (TPH-ss) were reported in the groundwater sample collected from boring KB-9 at a maximum concentration of 0.93 mg/L. Total petroleum hydrocarbons as Stoddard Solvent (TPH-ss) were reported in the groundwater sample collected from boring KB-9 at a maximum concentration of 0.93 mg/L. An ESL for TPH-ss has not been established; however, because the carbon chain of TPH-ss is similar to TPH-d, the ESL for TPH-d has been used for comparison (5 mg/L). Thus, the documented TPH-ss concentration is below the surrogate ESL.

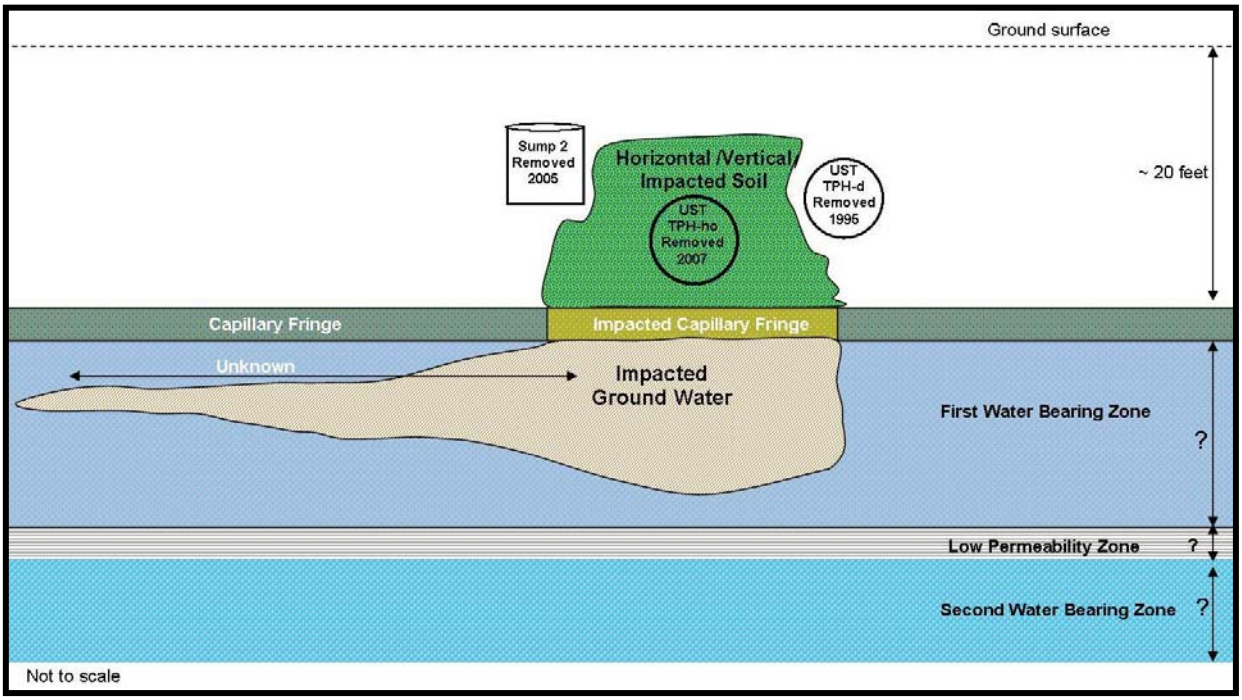
3.0 IDENTIFICATION OF DATA GAPS AND SCOPE OF WORK

This section describes a conceptual contaminant migration model, identifies data gaps, and presents a scope of work to fill the identified data gaps.

3.1 CONCEPTUAL SITE MODEL

The conceptual site model presented in this section describes and summarizes the understanding of current subsurface conditions at the Site. The conceptual Site model is based on the results of previous investigations and serves as the guideline for the proposed investigation.

The figure below is a graphical interpretation of current subsurface conditions in the area where the presence of petroleum hydrocarbons associated with the former UST for diesel, former Sump-2, and the former UST for heating oil have been documented. The former USTs for diesel and heating oil and the sump were in relatively close proximity to each other, and hereafter this area will be referred to as the area of concern.



Based on field observations and analytical results from subsurface investigations at the Site, it appears that petroleum hydrocarbons released from one or more of these

containers migrated through the unsaturated soil and capillary fringe into groundwater. Once in groundwater, petroleum hydrocarbons are subject to horizontal advective transport. Due to their low water solubility and low density relative to water, petroleum hydrocarbons can be considered light non aqueous phase liquids (LNAPL) that will tend to stay near the water table. Dissolved constituents may disperse in and migrate with groundwater in the water bearing zones (WBZ). The concentrations of the dissolved constituents will tend to attenuate by physical factors, such as adsorption to soil particles and dispersion, as well as by biological degradation. Low permeability sediments located below more permeable soil layers will tend to retard the potential downward movement of the dissolved petroleum hydrocarbon constituents.

During the removal of the UST for heating oil, approximately 100-cubic yards of petroleum hydrocarbon impacted soil were excavated and disposed of off-site. A depth of approximately 14 feet bgs was reached. The analytical results of the excavation's confirmation soil samples indicate the presence of TPH-d as high as 774 mg/Kg in the northern wall of the excavation; indicating that residual impacted soil remains at the Site.

3.2 PROBLEM DEFINITION

Petroleum hydrocarbons in soil and groundwater have been reported in the area of concern at concentrations above their respective ESLs. While the primary sources of contamination in the area of concern have been removed, secondary source material may remain in soil, the capillary fringe, and shallow groundwater in the area of concern. As discussed in Section 2 of this work plan, subsurface investigation work has been performed to confirm and assess the presence of petroleum hydrocarbons in soil and groundwater; however, data gaps on the Site's subsurface condition exist, including:

- Defining the horizontal and vertical extent of impacted soil and groundwater in the area of concern;
- Confirming that the petroleum hydrocarbon compounds identified in soil and groundwater are breaking down, and that conditions exist for the continuing breakdown of petroleum hydrocarbon compounds;
- Identifying the location and thickness of the first encountered WBZ;

- Confirming and assessing groundwater flow rates and direction;
- Assessing the depth and environmental quality of the low permeability zone beneath the first encountered WBZ;
- Assessing the presence of potential preferential pathways for contaminants to migrate offsite;
- Assessing the fate of chemicals of concern identified on site and identifying potential environmental receptors.

3.3 SCOPE OF WORK

Based on previously collected data, summarized in Section 2.0, the following subsections provide a scope of work to fill data gaps.

3.3.1 Impacted Soil Delineation of the Area of Concern

To assess the horizontal and vertical extent of impacted soil, four borings (A – D) will be advanced within or in the vicinity of the area of concern until the second discrete WBZ is encountered or a maximum depth of approximately 35 feet bgs is reached. Plate 3 shows the approximate location of the proposed borings. Soil samples for chemical analysis will be collected at regular intervals from borings A - D, as described in section 4.4.

3.3.2 Delineation of Impacted Groundwater

To assess groundwater quality conditions at the Site, six groundwater monitoring-wells (MW-1 to MW-6) will be installed. Three groundwater monitoring wells will be installed within the area of concern, in borings A – C; and three additional groundwater monitoring wells, one up gradient and two down gradient of the area of concern will be installed to confirm that impacted groundwater is restricted to the area of concern. Plate 3 shows the approximate location of the proposed wells. The proposed wells will be screened within the first encountered WBZ, between approximately 20-feet bgs to an assumed maximum depth of 30-feet bgs.

3.3.3 Groundwater Sampling

If, while advancing borings A – D, a second discrete WBZ is encountered, grab groundwater samples for chemical analysis will be collected from the second WBZ. The grab groundwater sample(s) will be sent to an analytical laboratory for VOC and total petroleum hydrocarbons chemical analysis within a 24-hour turn around time. If VOCs or petroleum hydrocarbons are reported at concentrations above the laboratory's reporting limit in the groundwater sample(s), paired monitoring wells will be installed adjacent to the proposed well(s), and screened in the second discrete WBZ.

3.3.4 Groundwater Monitoring

Three quarterly groundwater monitoring events will be performed to obtain information on 1) the hydraulic gradient at the site, 2) assess potential changes in the quality of groundwater at the Site, and 3) confirm that conditions for the continued breakdown of petroleum hydrocarbons are present in groundwater at the Site. Groundwater monitoring events will consist of the collection of groundwater field parameters, including depth to water, temperature and conductivity, and samples for chemical analysis from the six wells installed on site. Groundwater samples will be analyzed for VOCs, petroleum hydrocarbons, dissolved oxygen, and other parameters indicative of conditions conducive for natural biodegradation of COCs.

3.3.5 Potential Contamination Conduits and Sensitive Receptor Survey

Information on the location, status and construction of water wells and underground utilities within a 2,000-foot radius of the Site will be obtained to assess the presence of preferential pathways for contaminants documented in groundwater to migrate offsite.

4.0 PRE-FIELD AND FIELD ACTIVITIES

This section describes the scope of the pre-field and field activities of the proposed subsurface investigation, including:

- Acquiring required permits and retaining sub-contractors;
- Advancing seven borings, (Plate 3);
- Collecting soil samples for chemical analysis from borings A – D;
- Collecting groundwater samples for chemical analysis from borings A – D where a second discrete WBZ is encountered;
- Installing groundwater monitoring wells in six of the seven borings (Plate 3);
- Installing paired wells in the second WBZ if encountered in the area of concern and the groundwater in that zone if VOCs or petroleum hydrocarbons are reported at concentrations above the reporting limit;
- Retaining a licensed surveyor to provide location coordinates of borings and monitoring well head elevations;
- Performing three quarters of groundwater monitoring; including the collection of groundwater physical parameters and samples for chemical analysis;
- Uploading the proposed investigation results and previous investigation results into the GeoTracker system; and
- Obtaining information on the location, status and construction of water wells and underground utilities within a 2,000-foot radius of the Site that may serve as preferential pathways for petroleum hydrocarbons in groundwater.

Activities proposed in this work plan will be conducted under the supervision of a California Professional Geologist (P.G.) or Professional Engineer (P.E.). Kleinfelder will only contract with State-licensed drillers and use California Department of Health Services Environmental Laboratory Accreditation Program and National Laboratory Accreditation Program certified analytical laboratories.

4.1 PRE-FIELD ACTIVITIES

Kleinfelder will prepare and submit the permit application to the Alameda County Public Works Agency (ACPWA) to advance seven boreholes and install six wells.

Based on the results of the recently performed geophysical survey at the Site (Kleinfelder 2008), the presence of underground utilities is not apparent, and therefore the services of a private utility locator will not be retained. However, Kleinfelder will mark the proposed boring/well locations with white paint and notify Underground Service Alert at least 48 hours prior to initiating drilling activities.

4.2 SOIL BORING ADVANCEMENT AND WELL INSTALLATION

Kleinfelder will retain the services of a licensed driller to advance seven soil borings and install six groundwater monitoring wells. The locations of the proposed soil borings and wells are shown on Plate 3. The borings will be advanced with a truck-mounted hydraulic and percussion drive-point rig with dual-wall drilling capabilities. Borings for logging and sampling purposes will be advanced by direct push, and wells will be installed by hollow stem auger methods.

The thickness of the first WBZ is unknown and based on the varying water yields obtained in the previous investigation (Kleinfelder 2008), the thickness of the WBZ is likely to vary within short distances. To assess the environmental quality of the low permeability zone underneath the first discrete WBZ, borings A – D will be advanced until a second discrete WBZ is encountered or a maximum depth of 35-feet bgs, which ever occurs first.

To monitor groundwater quality at the Site, groundwater monitoring wells will be installed in six of the seven borings. Three wells (MW-2, -3, and -4) will be installed within the area of concern; one (MW-1) up-gradient and two (MW-5 and MW-6) down-gradient of the area of concern. Since the first WBZ is expected to be encountered at approximately 20-feet bgs, the depth of the wells is expected to vary between 25- and 30-feet bgs.

If a second WBZ is encountered and the analytical results of the grab groundwater sample(s) collected from this zone indicate that VOCs or total petroleum hydrocarbons are present at concentrations above the laboratory's reporting limit, paired monitoring wells will be installed. Paired wells will be screened in the second discrete WBZ.

An 8-inch-diameter hollow stem auger will be used to advance the boreholes to install the wells. Before the hollow stem auger is advanced to create the borehole for well installation, the direct push boreholes will be grouted with cement.

The six wells, as well as any paired well, will be constructed with 2-inch-diameter, schedule 40 polyvinyl chloride (PVC) pipe, and flush threaded 0.010 or 0.020-inch factory slotted pipe will be used in the screened section. Slot size will depend on the grain size of the sediment encountered in the WBZ. The screened section of the wells will be a maximum of 10-feet. The annular space between the well screen and the boring wall will be backfilled with No. 2/12 Lonestar sand-pack (or equivalent) to form a filter pack that will extend to approximately two feet above the well screen. Upon placement of the filter pack, a two-foot annular seal will be constructed using bentonite pellets hydrated in place with potable water. Neat cement grout, consisting of 95 pounds of cement mixed in five gallons of potable water, will be poured using a tremie pipe on top of the bentonite seal. The grout seal will extend to within approximately one foot of ground surface. The wells will be completed with a well box and fitted with a watertight locking cap.

The annular seal grout will be allowed to cure for 48 to 72 hours before the wells are developed. Well-development will be performed by surging, bailing, and pumping water to remove fine sediments from the well casing and sand pack. During purging, conductivity, pH, temperature, and turbidity measurements will be obtained at regular intervals, approximately after each gallon of water is purged. Field measurements and observations will be recorded on well development logs. Well development will continue until one of the following occurs: 1) groundwater appears relatively clear; or 2) at least ten well volumes are removed (approximately six to eight gallons from each well).

Soil cuttings generated during soil boring advancement and well drilling will be contained, separately, in U.S. Department of Transportation (DOT)-approved, 55-gallon

steel drums. The drums will be labeled and temporarily held at the Site pending disposal determination.

4.3 DRILLING EQUIPMENT DECONTAMINATION

The rods and augers used to advance the borings and drill the wells will be steamed cleaned before being advanced into the subsurface. Rinsates will be stored in U.S. DOT-approved, 55-gallon steel drums.

4.4 SOIL SAMPLING AND ANALYSIS

The soil in the boring cores will be screened with a PID, and logged according to the Unified Soil Classification System. Boring logs describing the stratigraphy encountered in each boring, PID readings at approximately two to five-foot intervals, and the depth where groundwater is encountered will be prepared with the collected field information.

Previous analytical soil data indicate that impacted soil in the area of concern was encountered at depths below 10 feet bgs, particularly in the walls and bottom of the UST removal excavation. During the proposed investigation, soil samples from borings A – D will be collected at approximately 4 foot intervals, starting at 12-feet bgs until the WBZ is reached, and then through the low permeability zone if encountered. Soil samples for chemical analysis will be selected from the first encountered WBZ capillary fringe, the low permeability zone below the first encountered WBZ, and where field observations, including odor, stains and PID readings of 50 ppm or greater are observed.

Soil samples for chemical analysis from the other proposed monitoring well locations will not be collected unless field observations, such as petroleum odor, stains or PID readings above 50 ppm are observed.

Soil samples for chemical analysis will be collected in acetate liners advanced with the boring rods. Samples will be obtained by cutting approximately six-inch sections of the acetate liners. The ends of the acetate liners with the soil samples will be covered with Teflon® sheets and capped with plastic end caps. The samples will be labeled and placed in a cooler with “wet” ice for transport to an analytical laboratory, following chain-

of-custody procedure. Soil samples will be analyzed using the following Environmental Protection Agency (EPA) Methods:

- Total Extractable Petroleum Hydrocarbons (with silica gel cleanup) using EPA Method 8015M
- TPH-g and VOCs (including BTEX, and fuel oxygenates, ethylene dibromide [EDB], and ethylene dichloride [EDC]), using EPA Method 8260B.

The number of proposed soil samples for chemical analysis, the sample collection depths, and analytical methods are summarized below:

Number of Samples	Approximate Depth (feet bgs)	Constituent(s)	EPA Analytical Method
8	First WBZ capillary fringe (18 to 20 feet) and, Low permeability zone below first WBZ (26 to 30-feet)	Total Extractable Petroleum Hydrocarbons (with Silica Gel Cleanup)	8015M
		TPH-g and VOCs	8260B
4	12 to 20 feet; depth determined on the field based on the presence of stains, odors or elevated PID readings	Total Extractable Petroleum Hydrocarbons (with Silica Gel Cleanup)	8015M
		TPH-g and VOCs	8260B
4	Approximately 30-feet (assumed)	Total Extractable Petroleum Hydrocarbons (with Silica Gel Cleanup)	8015M
		TPH-g and VOCs	8260B

4.5 GROUNDWATER SAMPLING AND ANALYSIS

If a second WBZ is encountered in borings A – D, grab groundwater samples will be collected from this zone using a peristaltic pump with new tubing or dedicated bailer at each boring, and contained in laboratory-supplied vials. The samples will be labeled and stored in a cooler with “wet” ice for transport to an analytical laboratory, following chain-of -custody procedure. Grab groundwater samples from the second WBZ will be analyzed with a 24-hour turn-around-time using the following EPA Methods:

- Total Extractable Petroleum Hydrocarbons for diesel and motor oil using EPA Method 8015M and silica gel cleanup;

- Total Petroleum Hydrocarbons as gasoline (TPH-g) using EPA Method 8015M; and

- VOCs, including BTEX, fuel oxygenates, and EDB and EDC, using EPA Method 8260B.

4.6 GROUNDWATER MONITORING

Groundwater conditions, including physical and chemical parameters, will be monitored for three consecutive quarters. The first groundwater monitoring event will take place immediately after well development. The second and third groundwater monitoring events will take place approximately three and six months thereafter. Groundwater samples will be collected from each well using new polyvinyl chloride (PVC)-disposable bailers. Before collecting groundwater samples the wells will be purged. Physical parameters of the purge water, including conductivity, pH, temperature, and turbidity readings will be measured periodically, approximately after each gallon of water is purged, and recorded. The well-water will be purged until physical parameters have stabilized, or a maximum of ten well volumes have been purged. Stabilization of physical parameters will be assumed when three consecutive readings are within a maximum ten percent difference.

Groundwater samples for chemical analysis will be contained in laboratory-supplied vials, labeled, and stored in a cooler with “wet” ice for transport to a State-certified laboratory, following chain-of -custody protocol. The laboratory will be request to analyze the groundwater samples using the following EPA Methods:

- Total Extractable Petroleum Hydrocarbons (with silica gel cleanup) using EPA Method 8015M;

- TPH-g using EPA Method 8015M;

- VOCs, including BTEX, fuel oxygenates, EDB and EDC using EPA Method 8260B

During the first monitoring event, natural attenuation parameters will be measured and analyzed for in five selected wells, one up gradient, two within the area of concern, and two down gradient wells. Dissolved oxygen and reduction-oxidation (REDOX) potential will be measured with a flow through cell, and samples will be analyzed at the laboratory for nitrate, ferrous iron, sulfate, methane, ammonia and phosphate.

4.7 SOIL BORING AND MONITORING WELL SURVEYING

Kleinfelder will retain the services of a licensed land surveyor to survey the locations and elevations of the borings and monitoring wells, consistent with GeoTracker requirements. The elevations for the monitoring well heads will be determined to plus or minus 0.01 foot.

4.8 INVESTIGATION-DERIVED WASTE MANAGEMENT

Investigation-derived waste, such as decontamination rinsate fluids and soil cuttings, will be contained in U.S. DOT-approved, 55-gallon steel drums. Liquid and solid waste will be stored separately. The drums will be labeled and temporarily held at the Site. Kleinfelder will profile the waste materials for its disposal at a permitted facility.

5.0 NON-FIELD ACTIVITIES

This section describes proposed non-field activities to be performed as part of the investigation.

5.1 UPLOAD INFORMATION INTO GEOTRACKER

Kleinfelder will upload available environmental information on the Site into the GeoTracker system. The information to be uploaded will include the coordinates of soil borings and wells obtained by the land surveyor, and analytical results of the samples collected during this investigation. Kleinfelder will also upload the results and reports of previous investigations, including the:

- Subsurface Investigation 3623 Adeline Street, Emeryville, California (Kleinfelder 1996);
- Phase 1 ESA 1160-1168 36th Street and 3601 & 3623 Adeline Street, Emeryville, California (Clayton 2003a);
- Soil and Groundwater Sampling Investigation at 1160-1168 36th Street and 3601 & 3623 Adeline Street, Emeryville, California (Clayton 2003b);
- Environmental Consulting Services for Sump Closure Former Ambassador Laundry, 36th Street and Adeline Street, Emeryville, California (Clayton 2005); and
- Former Ambassador Laundry Subsurface Investigation Underground Storage Tank Removal and Remediation Report City of Emeryville, Alameda County, California (Kleinfelder 2008).

5.2 POTENTIAL CONDUIT AND RECEPTORS ASSESSMENT

Kleinfelder will obtain information from the City of Emeryville Public Works Agency on the location of utility lines and corridors located in the vicinity of the Site, and will request information on the location, status, and well construction data on groundwater monitoring wells located within a 2,000-foot radius from the former UST location from the ACPWA and the California Department of Water Resources. Information on the

location and characteristics of the potential conduits for contamination to the Site will be summarized, and a plate showing the approximate location of the potential conduits will be prepared and included in the report.

6.0 QUALITY ASSURANCE/QUALITY CONTROL

6.1 FIELD PROCEDURES

Field quality assurance/quality control (QA/QC) procedures will be documented by two means: field documentation and QC sample collection and analysis.

6.1.1 Field Documentation

The following five formats will be used for documenting field activities:

- Daily field report;
- Field data sheets;
- Sample labels; and
- Chain-of-custody forms.

6.1.2 Daily Field Report

Field data will be recorded in a logbook or daily field report forms. Recorded data will include date and weather conditions when fieldwork is being performed, as well as time of arrival and relevant events, such as drilling start and end times, the arrival/departure and conversations with stakeholders, such as Site custodians and or government agency personnel.

Field notes will also include any anomalies observed in soil, such as stains, odors or high PID readings, and the time and depth samples are collected.

6.1.3 Field Data Sheets

The data sheets will be completed in the field and include: daily field reports and geologic boring logs.

6.1.4 Sample Labels

Sample labels will be completed in waterproof ink before the sample is placed into the cooler. Sample labels will include the following information: sample identification (ID)

number, project number, sample collection date and time, sample location, preservative, and samplers' initials.

6.1.5 Chain-of-Custody

Custody of field samples is maintained and documented from the time of sample collection through receipt of samples at the analytical laboratory using chain-of-custody procedures. Information on the chain-of-custody record will include: sample date and time, sample ID and location, matrix, number of containers, requested analyses, data turnaround time, project manager's name, project number, project name and location, client and laboratory names, and sampler signatures. Sample containers will be hand-delivered to the selected analytical laboratory accompanied by chain-of-custody records.

6.1.6 Field QA/QC Sample Collection and Analysis

One duplicate groundwater sample will be collected from the monitoring wells during each sampling round. Due to the heterogeneity of soil samples, duplicates soil samples will not be collected. In addition, one trip blank per cooler of VOC samples will be provided to the analytical laboratory.

Field instrumentation, including PID and flow through cell for measuring dissolved oxygen and REDOX potential will be calibrated daily before use.

6.2 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL

Analytical testing will be performed by an analytical laboratory certified by the California Department of Health Services Environmental Laboratory Accreditation Program and the National Laboratory Accreditation Program. The laboratory will maintain and document custody of the samples from the time of sample receipt through sample disposal. The analytical laboratory has established custody procedures that include:

- Designation of a sample custodian;

- Completion of the chain-of-custody record, any sample tags, and laboratory request sheets, including documentation of sample condition upon receipt by the custodian;
- Laboratory sample tracking and documentation procedures;
- Secure sample storage with the appropriate environment (e.g. refrigerated, dry);
- Data logging and documentation procedures, including custody of original laboratory records.

Kleinfelder will review executed chain-of-custody and laboratory receiving documentation as provided with analytical results.

7.0 SITE INVESTIGATION REPORT PREPARATION

A Post Remediation Evaluation Report will be prepared to: document field activities and observations; summarize the analytical results; and provide conclusions and recommendations based on field observations and analytical results. The Site Investigation Report will include the following sections:

- Introduction, describing the purpose and objectives of the investigation;
- Background, summarizing the Site's known land use history and results of prior environmental investigations;
- Field Activities, summarizing the actions performed during the proposed investigation;
- Site's general geology, summarizing the general geologic characteristics encountered during the investigation. This section will include cross section diagrams describing the site's stratigraphy and iso-contour maps describing the hydraulic gradient of groundwater in the WBZ;
- Analytical results summarizing the analytical methods and results for this investigation. This section will reference tables summarizing the analytical results of COCs reported at concentrations above the laboratory's reporting limit, and plates showing the approximate location of borings. The analytical results of the proposed and previous investigations will be used to create cross sections describing the horizontal and vertical extent of petroleum hydrocarbons in soil reported at concentrations above their respective ESLs.
- Groundwater quality, summarizing groundwater parameters, including color, conductivity, groundwater elevation, pH, temperature, and turbidity. This section will reference tables summarizing the analytical results of constituents reported at concentrations above the laboratory's reporting limit, and iso-concentration contour maps of VOCs and petroleum hydrocarbon in groundwater reported at concentrations above their respective ESLs.
- Analytical results of natural attenuation parameters and a discussion of the natural attenuation potential present at the Site;

- Description of field and laboratory QA/QC procedures.
- A summary of the review of potential preferential pathways found within a 2,000 foot radius of the Site;
- Conclusions based on field observations and analytical results.

The following information will be included as Appendices in the Report:

- Boring logs, and
- Laboratory analytical reports and executed chain-of-custody records.

The subsurface investigation and report preparation will be conducted under the direct supervision of, and will be signed and stamped by, a California P.G. or P.E.

8.0 GROUNDWATER MONITORING REPORTS

The second and third Quarterly Groundwater Monitoring Reports will be prepared to document the physical conditions of groundwater encountered in each well, including color, conductivity, groundwater elevation, pH, temperature, and turbidity; as well as the analytical results of the groundwater samples collected from each well. The second and third quarterly groundwater monitoring reports will include the following sections:

- Introduction, describing the purpose and objectives of the investigation;
- Background summarizing the Site's known land use history and results of prior environmental investigations;
- Groundwater Physical conditions, summarizing the observed and or measured groundwater parameters, including color, conductivity, groundwater elevation, pH, temperature, and turbidity. Plates showing the groundwater elevation iso-contours will be prepared and referenced in this section;
- Analytical results; summarizing the analytical methods used and constituents analyzed during each groundwater monitoring event. This section will reference tables summarizing the analytical results of constituents reported at concentrations above the laboratory's reporting limit. Plates showing the iso-concentrations of the primary chemicals of concern reported at concentrations exceeding their respective ESLs in groundwater will be prepared and referenced in this section; and
- Conclusions based on the physical parameters and chemical analytical results.

Certified laboratory analytical reports and chain-of-custody records will be included as Appendices in the Report:

Groundwater monitoring and report preparation will be conducted under the direct supervision of, and will be signed and stamped by, a California P.G. or P.E.

9.0 SCHEDULE

Kleinfelder will begin implementing the activities described in this work plan as soon as approval from the ACEH and City of Emeryville authorization to proceed is received. Field preparation activities will include securing the required permits and approvals from regulatory agencies, as well as scheduling inspectors and a drilling sub-contractor, and are anticipated to take two to three weeks. Fieldwork is anticipated to take approximately four to fives days, followed by approximately two weeks for chemical analysis. The Site Investigation Report will include the results of the first groundwater monitoring event and will be prepared for submittal in approximately six weeks after receiving the analytical results. Overall, the proposed Site investigation will be completed in approximately ten to eleven weeks following authorization.

The subsequent groundwater monitoring events will be conducted approximately three and six months after the subsurface investigation is completed. Groundwater monitoring reports are anticipated to be completed three weeks after receipt of analytical data.

The reports and analytical results will be submitted to the ACEH and uploaded onto the GeoTracker system.

10.0 HEALTH AND SAFETY

A Site specific Health and Safety Plan (HASP) will be prepared in general accordance with Federal Occupational Safety and Health Administration (OSHA) and California Department of Safety and Health (DOSH) requirements outlined in 29 CFR Part 1910.120[j]; Title 8, CCR, Section 5192.

The Site-specific HASP will provide general guidelines for decision points in Site safety planning and will establish personnel protection standards and mandatory safety practices and procedures. The HASP will cover the following subjects:

- Emergency contacts to be used in the event of an accident or exposure;
- Description of potential onsite hazards, both physical and chemical;
- On-site monitoring and personnel protection requirements;
- Project team organization and responsibilities;
- Site control measures; and
- Decontamination procedure requirements.

The HASP will be prepared prior to field activities, and its provisions will be mandatory for onsite personnel. A field investigation kick-off meeting will be held each field work day, and the contents of the HASP will be reviewed with all Site personnel.

11.0 LIMITATIONS

Kleinfelder prepared this report in accordance with generally accepted standards of care that exist in Alameda County at this time. This report may be used only by the City of Emeryville and only for the purposes stated, within a reasonable time from its issuance, but in no event later than one (1) year from the date of the report. All information gathered by Kleinfelder is considered confidential and will be released only upon written authorization of the City of Emeryville or as required by law. Non-compliance with any of these requirements by the City of Emeryville or anyone else, unless specifically agreed to in advance by Kleinfelder in writing, will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party and the City of Emeryville agrees to defend, indemnify, and hold harmless Kleinfelder from any claim or liability associated with such unauthorized use of non-compliance.

Kleinfelder offers various levels of investigation and engineering services to suit the varying needs of different clients. It should be recognized that definition and evaluation of geologic and environmental conditions are a difficult and inexact science. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present. Although risk can never be eliminated, more-detailed and extensive investigations yield more information, which may help understand and manage the level of risk. Since detailed investigation and analysis involves greater expense, our clients participate in determining levels of service that provide adequate information for their purposes at acceptable levels of risk. More extensive studies, including subsurface investigations or field tests, may be performed to reduce uncertainties. Acceptance of this report will indicate that the City of Emeryville has reviewed the document and determined that it does not need or want a greater level of service than provided.

During the course of the performance of Kleinfelder's services, hazardous materials may be discovered. Kleinfelder will assume no responsibility or liability whatsoever for any claim, loss of property value, damage, or injury that results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials. Nothing contained in this reports should be construed or interpreted as requiring Kleinfelder to assume the status of an owner, operator, generator, or person who arranges for disposal, transport, storage or

treatment of hazardous materials within the meaning of any governmental statute, regulation or order. The City of Emeryville will be solely responsible for notifying all governmental agencies, and the public at large, of the existence, release, treatment or disposal of any hazardous materials observed at the project site, either before or during performance of Kleinfelder's services. The City of Emeryville will be responsible for all arrangements to lawfully store, treat, recycle, dispose, or otherwise handle hazardous materials, including cuttings and samples resulting from Kleinfelder's services.

Regulations and professional standards applicable to Kleinfelder's services are continually evolving. Techniques are, by necessity, often new and relatively untried. Different professionals may reasonably adopt different approaches to similar problems. As such, our services are intended to provide the City of Emeryville with a source of professional advice, opinions and recommendations. Our professional opinions and recommendations are/will be based on our limited number of field observations and tests, collected and performed in accordance with the generally accepted engineering practice that exists at the time and may depend on, and be qualified by, information gathered previously by others and provided to Kleinfelder by the City of Emeryville. Consequently, no warranty or guarantee, expressed of implied, is intended or made.

12.0 REFERENCES

Clayton, 2003a, Phase I Environmental Site Assessment 1160-1168 36th Street and 3623 Adeline Street, Emeryville, California, May 28.

Clayton, 2003b, Soil and Groundwater Sampling Investigation at 160-1168 36th Street and 3623 Adeline Street, Emeryville, California, May 28.

Clayton, 2005, Environmental Consulting Services for Sump Closure, Former Ambassador Laundry, 1160-1168 36th Street and 3623 Adeline Street, Emeryville, California, November 22.

Kleinfelder, 1996a, Subsurface Investigation, 3623 Adeline Street, Emeryville, California, January 29.

Kleinfelder, 1996b, Final Groundwater Sampling Report and Request for Closure, 3623 Adeline Street, Emeryville, California, April 15.

Kleinfelder, 2008, Former Ambassador Laundry Subsurface Investigation Underground Storage Tank Removal and Remediation Report, City of Emeryville, Alameda County, California, March 11.

SFBRWQCB, 2007, Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater, San Francisco Bay Regional Water Quality Control Board, November 2007 (revised 2008).

Southwest Geophysics, 2007, Geophysical Evaluation, Ambassador Laundry, Emeryville, California, August 24.

PLATES

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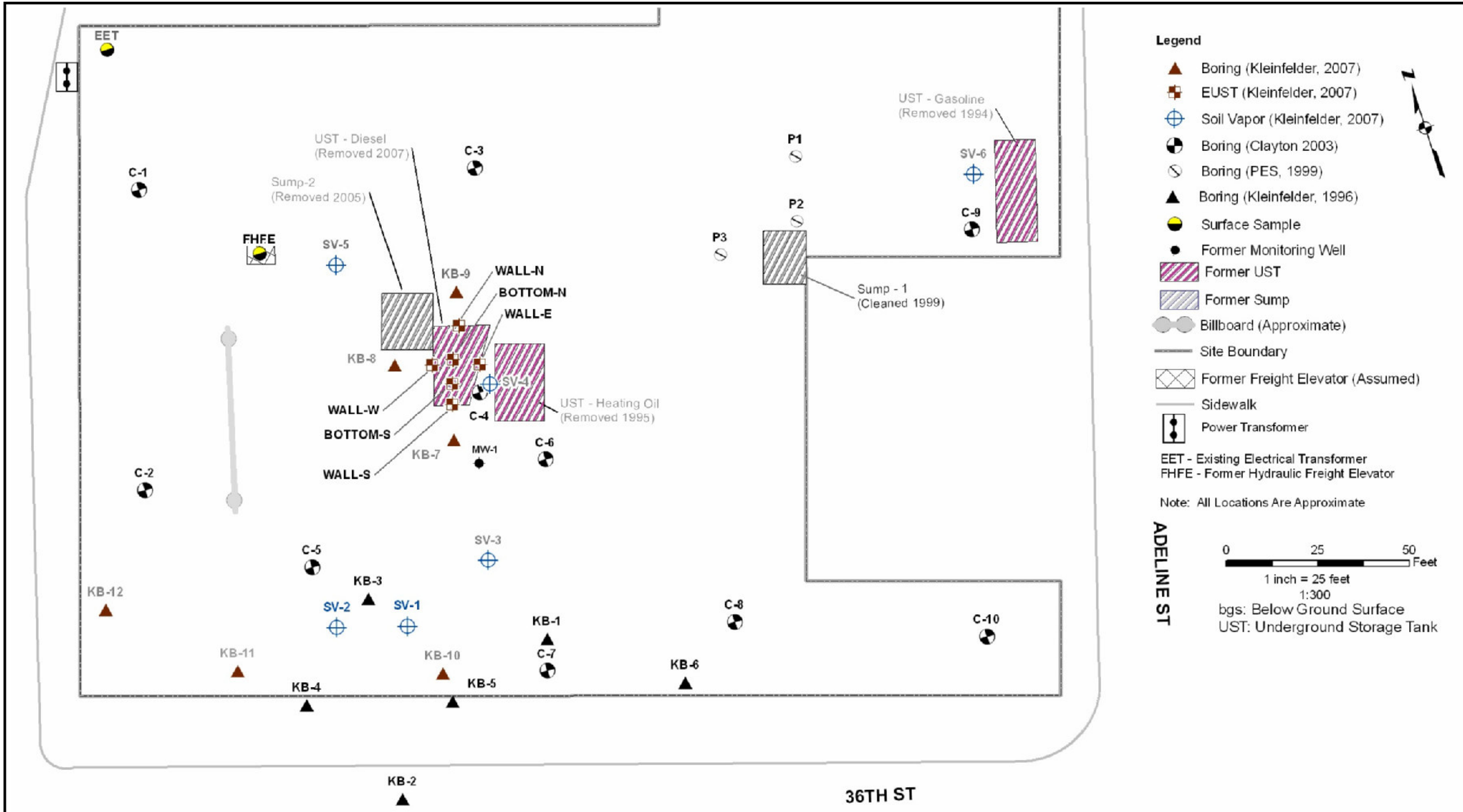
PROJECT NO.	73943-pw-
DRAWN:	August 28, 2008
DRAWN BY:	IMc
CHECKED BY:	AD
FILE NAME:	Former Ambassador Laundry

Site Vicinity Map

Former Ambassador Laundry
Further Site Investigation Work Plan
3601-3623 Adeline Street in Emeryville, California

PLATE

1



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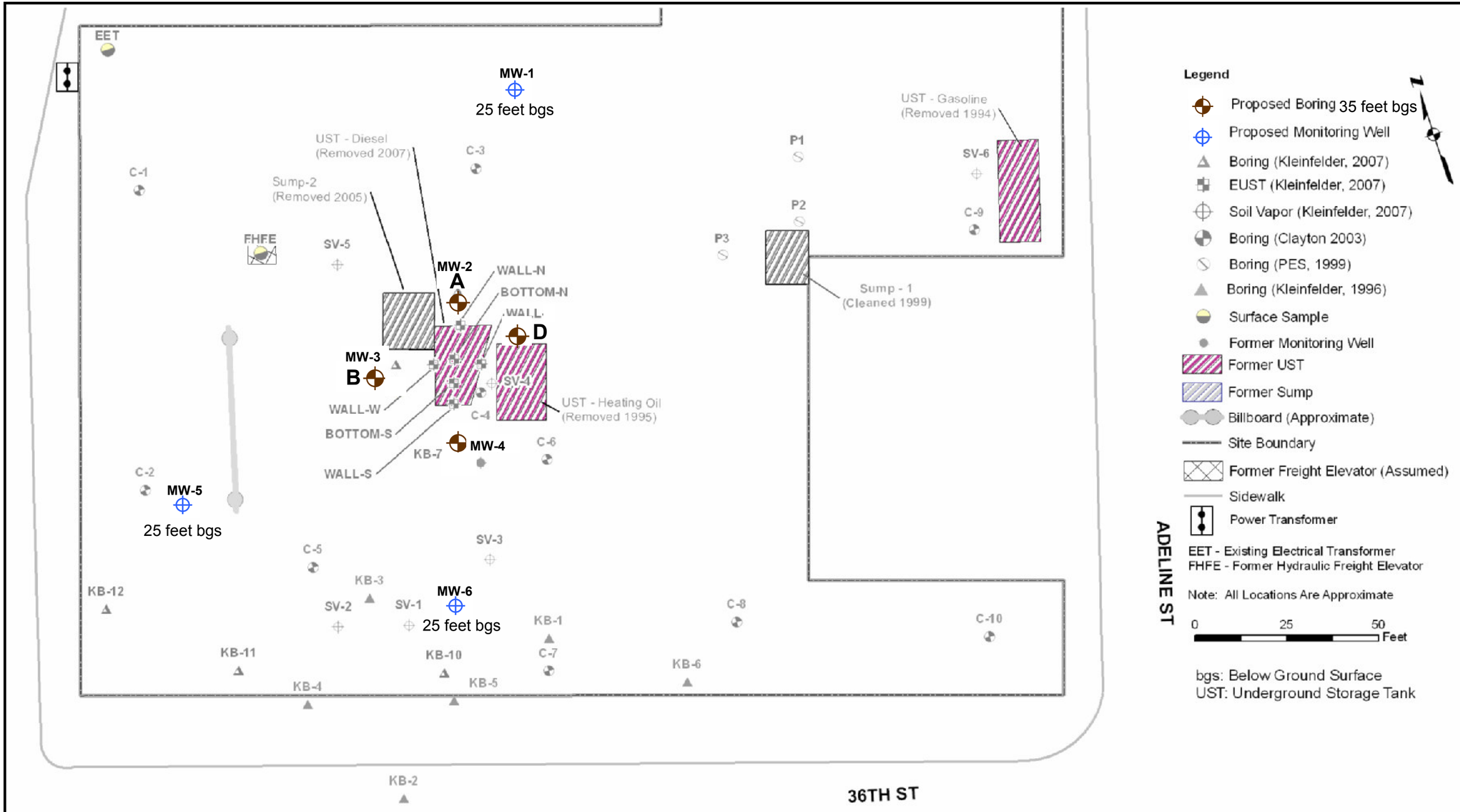
PROJECT NO.	73943
DRAWN:	August 20, 2008
DRAWN BY:	IMc
CHECKED BY:	AD
FILE NAME:	Former Ambassador Laundry

Site Map and Former Sampling Points

Former Ambassador Laundry
Further Site Investigation Work Plan
3601-3623 Adeline Street in Emeryville, California

PLATE
2



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PROJECT NO.	73943
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FILE NAME:	Former Ambassador Laundry

Proposed Locations of Borings and Monitoring Wells

Former Ambassador Laundry
Further Site Investigation Work Plan
3601-3623 Adeline Street in Emeryville, California

PLATE
3