DEPARTMENT OF TRANSPORTATION
111 GRAND AVENUE
P. O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 286-5635
TTY (800) 735-2929

Flex your power!
Be energy efficient!

March 29, 2011

Ms. Barbara Jakub
Hazardous Materials Specialist
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Subject: Report Submittal- 6th Street & Castro Street, Oakland, CA 94607

Reference: ACEH Fuel Leak Case No. RO250, Facility Global ID # T0600102155

Dear Ms. Jakub:

On behalf of California Department of Transportation (Caltrans), I am pleased to submit the following environmental investigation reports for the above referenced site:

1. 6th at Castro St, Oakland Work Plan
2. 4th Quarter 2008 Quarter Groundwater Monitoring Report
3. 1st Quarter 2009 Groundwater Monitoring Report
4. 2nd Quarter 2009 Groundwater Monitoring Report
5. Caltrans Site Investigation 6th and castro_OAK9R048.pdf
6. 2nd Quarter 2000 GW Monitoring Report

The groundwater monitoring reports were prepared by Kleinflder, Inc. and Professional Service Industries. The work plan for further investigation was prepared by Northgate Environmental Management, Inc.

Certification

I certify under penalty of law that these documents are prepared for Caltrans by the consultants in accordance with the system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing the violations.

If you have any questions, or comments, please contact me at (510) 286-5635.

Sincerely,

Charles D. Smith

CHARLES D. SMITH, P.E.
Senior Transportation Engineer
Office of Environmental Engineering

SITE INVESTIGATION
WORK PLAN
CALTRANS PROPERTY
SIXTH STREET AND CASTRO STREET
OAKLAND, CALIFORNIA

KLEINFELDER

May 30, 2008

Site Investigation Work Plan Prepared for:

California Department of Transportation
Consultant Services Unit, District 4
111 Grand Avenue
Oakland, CA 94623-0660

SITE INVESTIGATION WORKPLAN
CALTRANS PROPERTY
SIXTH STREET AND CASTRO STREET
OAKLAND, CALIFORNIA

TASK ORDER NO. 03
CONTRACT NO. 04A2497
CALTRANS EA NO. 04-0R0002

File No.: 94149/3

Prepared by:

Cynthia Ruelas, E.I.T.
Staff Professional

Lynne Srinivasan
Project Manager

Charles Almestad, P.G., C.HG.
Principal Professional

Jenny Meyer, C.I.H.
Certified Industrial Hygienist

KLEINFELDER WEST, INC.
1970 Broadway, Suite 710
Oakland, California 94612
(510) 628-9000

May 30, 2008

TABLE OF CONTENTS

1.0 INTRODUCTION 1
1.1 PURPOSE, OBJECTIVES AND SCOPE OF WORK 1

2.0 BACKGROUND INFORMATION 3
2.1 SITE DESCRIPTION 3
2.2 HISTORICAL SITE INFORMATION 3
2.3 GEOLOGY/HYDROGEOLOGY 7

3.0 PROPOSED INVESTIGATIONS 9
3.1 CONTAMINATION SOURCE IDENTIFICATION 9
3.2 PREFERENTIAL PATHWAY STUDY 9
3.3 TRENCHING 9
3.4 SOIL BORING SAMPLING 11
3.5 MONITORING WELL SAMPLING AND DEVELOPMENT 11

4.0 FIELD ACTIVITIES 13
4.1 FIELD PREPARATION ACTIVITIES 13
4.1.1 Boring/Monitoring Well Locations 13
4.1.2 Utility Clearance 14
4.1.3 Permits 14
4.2 FIELD SAMPLING ACTIVITIES 14
4.2.1 Trenching 14
4.2.2 Soil Borings 15
4.2.3 Borehole Abandonment 15
4.2.4 Monitoring Well Installation, Development, and Sampling 15
4.2.5 Decontamination of Sampling Equipment 17
4.2.6 Investigation-Derived Waste Management 17
4.2.7 Traffic Control 17

5.0 QUALITY ASSURANCE/QUALITY CONTROL 19
5.1 FIELD DOCUMENTATION 19
5.1.1 Field Log Book 19
5.1.2 Field Data Sheets 19
5.1.3 Photo Documentation Record 19
5.1.4 Sample Containers 20
5.1.5 Sample Labels 20
5.1.6 Sample Preservation 20
5.1.7 Sample Packaging and Shipment 20
5.1.8 Chain-of-Custody Records 21
5.1.9 Corrections to Documentation 21
5.2 FIELD QUALITY ASSURANCE/QUALITY CONTROL 21
5.3 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL 22

6.0 REPORT PREPARATION..... 23

7.0 PROPOSED SCHEDULE..... 24

8.0 HEALTH AND SAFETY 25

9.0 LIMITATIONS..... 26

10.0 REFERENCES 28

TABLES

Table 1 Proposed Sample Locations, Depths and Analyses
Table 2 Sample Container, Holding Time, and Preservative Requirements
Table 3 Investigation-Derived Waste Samples

PLATES

Plate 1 Site Vicinity Map
Plate 2 Site Plan
Plate 3 Site Plan with Historical Sample Locations
Plate 4 Site Plan with Proposed Sampling Locations

APPENDICES

A Historical Site Plan
B Location of Geophysical Investigation and Vertical Magnetic Gradient Contour Map
C IRIS Environmental Boring Locations
D Health and Safety Plan

1.0 INTRODUCTION

Kleinfelder prepared this Work Plan on behalf of the California Department of Transportation (Caltrans) to perform a site investigation at the Caltrans-owned site, located on the northwest corner of Sixth Street and Castro Street in Oakland, California (site) (Plates 1 and 2). This Work Plan was prepared in accordance with Task Order Number 3 issued on April 16, 2008 by Caltrans, Consultant Services Group, District 4 under Contract No. 04A2497.

This Work Plan describes the objectives, tasks, and methods for performing a site soil and groundwater investigation. Data collected from this investigation will later be used to prepare a feasibility study, an evaluation of various potential types of soil and/or groundwater cleanup activities, at the site.

This Work Plan is subject to review by the Alameda County Environmental Health Services (ACEHS). In general, this Work Plan was prepared in conformance with the ACEHS policies and guidelines. This site is listed under ACEHS Fuel Leak Case RO0000250.

1.1 PURPOSE, OBJECTIVES AND SCOPE OF WORK

The purpose of this investigation Work Plan is to fill data gaps in the information required to develop a feasibility study and correction action plan for the property. The results from this investigation will be used to evaluate alternatives for soil and/or groundwater remediation at the site.

The objectives of the investigation are as follows:

- To compile documentation indicating potential sources of contamination in soils and groundwater at the site;
- To perform a preferential pathway study;
- To assess historical concentrations of contaminants of concern in subsurface soils and in groundwater;

- To obtain soil and groundwater samples from soil borings for laboratory analysis;
- To carry out a quarterly groundwater monitoring program for a year to evaluate the migration of the plume beneath the site; and
- To collect soil and groundwater parameters to aid in future site remediation and cleanup

To meet these objectives the following scope of work will be implemented:

- Review existing documentation to assess the presence of potential sources of contamination at the site;
- Review utility maps and prepare cross-sections on the site to evaluate preferential pathways;
- Advance borings and collect soil and groundwater samples from these borings;
- Excavate trenches and collect soil samples from these trenches;
- Install/sample four new groundwater monitoring wells and develop/sample the three existing groundwater monitoring wells; and
- Prepare a report indicating the results of the investigation and recommendations.

2.0 BACKGROUND INFORMATION

This Section presents the site description, a summary of past activities and investigations at the site, and a summary of geological and hydrological information for this site.

2.1 SITE DESCRIPTION

This Caltrans-owned site is located in Oakland, California and is bordered to the north by Seventh Street, to the south by Sixth Street, to the west by Brush Street, and to the east by Castro Street. The site is approximately 1.6 acres in size. The Site Assessors Parcel Number (APN) is 1-221-14-1. Addresses listed for the subject parcel include: 616 Brush Street; 603, 609, 611 and 615 Castro Street; 716, 720, 722, 728, 738 an 740 Sixth Street; and 701, 717, 725, 738, 747 Seventh Street.

The site is currently vacant and unpaved, although a few truck trailers are currently located along the northern boundary of the site. Two piers from an elevated section of Interstate 980 are currently situated on the northeastern corner of the property. The site is in an area with combined commercial and residential-use. The site is relatively flat and at an elevation of approximately 20 feet above mean sea level. A storm drain inlet is located on the western portion of the property.

2.2 HISTORICAL SITE INFORMATION

The State of California acquired the site between July 1, 1969 and March 30, 1971. Since this time, Caltrans has owned and maintained the site. The site was historically used for residential and commercial purposes. In approximately 1973, the buildings that occupied the site were removed or demolished with the exception of the residence at 722 Sixth Street. No buildings were situated on the site after 1977. Although the site was undeveloped after 1977, construction-related material was staged at the site during the construction of Interstate Highway 980 in 1985. The materials stored on the site appeared to consist of stockpiled soil, concrete, and wood. The site currently does not contain any staged material.

Prior to the demolition of the buildings, the site was formerly subdivided into various lots, which have collectively housed a gasoline retail and auto repair station, a machine shop, a dairy, a laundry facility, a materials warehouse, residences, and retail stores (Appendix A). Commercial and/or residential use at these lots dates back to at least 1936. The majority of the site has been vacant since approximately 1977. The site was then used for storage of construction materials. According to an interview conducted with a Caltrans employee, the site stopped being used as material storage since approximately 1990.

According to information provided in a Phase I Environmental Site Assessment (ESA) Report prepared by Engeo Incorporated (Engeo, 1993), at least four former underground storage tanks (USTs) were installed at the site, and were utilized by a service station, warehouse, and dairy. The Oakland Fire Department issued a permit to Caltrans in January 1971 for the removal of three on-site USTs: one 10,000-, one 7,500-, and one 5,000-gallon. The permit listed the owner as the State of California Division of Highways. No Fire Department Inspection Reports were available for the businesses formerly on the site.

The first available environmental investigation at the site was performed in 1987 by ERM-West. ERM-West compiled a site history indicating the former businesses on the site with potential environmental concern. This included a gas station, a diary and a commercial warehouse. ERM-West stated that the gasoline station had at least two USTs and the creamery and warehouse maintained one UST each. ERM-West stated that it was their understanding that the USTs were removed at the time the buildings were demolished. ERM-West conducted a soil and groundwater study in which seven boreholes were advanced, ranging in depth from approximately 16.5 to 17.5 feet below ground surface (bgs) (Plate 3). The results of this investigation indicated detection of low concentrations of ethylbenzene, toluene, and xylene in four soil samples; three of these samples were collected from the western part of the site and one sample was collected from the eastern part of the site. Low concentrations of ethylbenzene, toluene, xylenes, hydrocarbons, and other aliphatic and alicyclic compounds were detected in a groundwater sample collected on the southwestern corner of the site.

A Phase I ESA of the site was conducted by Engeo Incorporated (Engeo) on January 27, 1993. Engeo concluded that existing and potential impacts to the soil and

groundwater have been documented on the site from a number of potential on-site sources. Based on this conclusion, Engeo recommended a subsurface investigation for the portion of the site where past site use could have included potential contaminants. This investigation would include collection of soil and groundwater samples with laboratory analysis. Records of a former groundwater production well at the site were found, however, upon visual inspection, it could not be located. Engeo recommended locating the well, and if found, to decommission the well according to applicable Alameda County ordinances. Engeo also recommended conducting a geophysical survey of the site to identify USTs or other subsurface structures prior to beginning an intrusive subsurface exploration. Engeo also recommended sampling surface or near-surface soil to assess whether or not hazardous levels of lead are present from historical use of lead-based paints. Engeo recommended decommissioning of the temporary monitoring well installed by ERM-West in 1987. Review of an adjacent site, the Francis Plating Company, was recommended to evaluate potential impacts to the site. Engeo recommended groundwater characterization on the northeastern portion of the site to determine the potential upgradient impact from the former gasoline service station situated on the northern corner of Seventh Street and Castro Street.

A geophysical survey was conducted at the site by Norcal Geophysical Consultants (Norcal), Inc. on July 21, 1995 (Appendix B). Five anomalies, A through E, were identified during the geophysical survey (Appendix B). Anomalies A, B, and D were located approximately in the middle of the site. Anomaly C and E were located on the southwestern part of the site. Anomalies A through C were characterized as high magnitude anomalies. Anomalies of these magnitudes and areal extents typically represent small USTs, or large isolated metallic objects such as utility vaults. However, the ground penetrating radar (GPR) data obtained over these anomalies resolved numerous zones of isolated hyperbolic signatures within the upper one to three feet that could represent a UST. Therefore, the source of these anomalies may also be buried deeper than the detection limits of the GPR. Anomalies D and E represented broad areas containing numerous magnetic gradients. Both anomalies comprised areas of approximately 5,000 to 10,000 square feet. The high magnitude values detected indicate significant disturbance of the magnetic gradient. GPR profiles were obtained over these anomalies. The data did not indicate hyperbolic signatures within the upper two to four feet that could represent a UST. Typically, isolated metal debris does not produce high magnitude anomalies as was indicated. Therefore, Norcal concluded that

the source of these anomalies was buried too deep to be further characterized by the GPR. The storm drain was identified during the course of the investigation. It was detected in the southwest corner of the site. Just north of the storm drain, a buried object, thought to be a large nonmetallic pipe or possibly a nonferrous tank was identified. Norcal estimated the depth of this object to be approximately two to three feet bgs.

In October 1995, Geocon was retained to conduct surface and subsurface soil sampling and groundwater sampling at the site. A total of seven borings were advanced at the site (Plate 3). The surface and subsurface soil samples were analyzed for total lead, metals, and oil and grease. Groundwater samples were collected from two of the borings and were analyzed for total petroleum hydrocarbons as gasoline (TPH-g), total petroleum hydrocarbons as diesel (TPH-d), and benzene, toluene, ethylbenzene, and xylenes (BTEX). The results indicated that a maximum concentration of 410 milligrams per kilogram (mg/kg) of total lead was detected in site subsurface soil (location OAK2 at three feet bgs). In addition, a maximum concentration of 8,000 mg/kg of oil and grease was detected in site subsurface soil (location OAK6 at three feet bgs). Relatively low concentrations of metals were detected in site surface and subsurface soil. TPH-g, TPH-d, and BTEX concentrations were not detected in groundwater at or above the laboratory detection limits.

In 1996, International Technology Corporation (ITC) advanced 11 borings ranging in depth from approximately 15 to 23 feet bgs. Samples were collected at 0.5, 2.5, 6.5, 10.5, and 14.5 feet bgs. The samples collected were analyzed for TPH-g, TPH-d, oil and grease, and BTEX. The majority of analytes tested were not detected at or above the laboratory detection limit. One boring location, B1-11, located on the southwestern corner of the site, contained elevated levels of hydrocarbons and associated constituents in soil and groundwater.

In 1999, PSI advanced 11 soil borings and installed three groundwater monitoring wells at the site. The soil boring locations were in approximately the same location as ITC's soil boring locations (Plate 3). The soil samples were analyzed for oil and grease, TPH-g, TPH-d, BTEX, lead, methyl tert butyl ether (MTBE), and VOCs. The results indicated that elevated levels of oil and grease and lead were detected throughout the site, especially in subsurface soil. PSI conducted groundwater monitoring in all three wells,

MW-1, MW-2, and MW-3, from the fourth quarter 1999 through the first quarter of 2001, for a total of seven quarters. See Plate 3 for the groundwater monitoring well locations. The groundwater samples were analyzed for TPH-g, TPH-d, TPH-motor oil, oil and grease, BTEX, VOCs, and lead. For all seven quarters, all analytes tested in MW-1 and MW-3 contained either relatively low concentrations or concentrations below the laboratory detection limit. MW-2, located near the southwestern corner of the site, has exhibited elevated concentrations of TPH-g, BTEX, and volatile organic compounds (VOCs). The latest March 5, 2001 results indicated the following concentrations for MW-2: TPH-g at a concentration of 65,000 micrograms per liter (µg /L); TPH-d at 6,500 µg /L; BTEX at 730, 3,100, 4,100, and 18,400 µg /L, respectively; and total VOCs at 4,720 µg /L.

In November 2001, IRIS Environmental conducted an investigation on the site and two adjacent parcels also owned by Caltrans for the Port of Oakland (Caltrans, 2002). Appendix C shows the approximate locations of the soil and groundwater samples collected. Samples were collected from three areas or "blocks": five locations were within the Sixth and Castro property; nine locations were within "Interstate Block A" directly south of the site; and nine locations were within "Interstate Block B" southwest of the site. Discrete soil samples were obtained from up to five intervals at each location to a maximum depth of 10.5 feet bgs. One soil composite soil sample was also collected from each location. Groundwater samples were collected from a subset of soil boring locations. The maximum reported concentration of petroleum hydrocarbons in soil was 770 mg/kg TPH as motor oil (TPH-mo) from the surface sample at location OAK-1BB-1. TPH-g was reported in soil at a maximum concentration of 1.4 mg/kg from the surface sample at location OAK-1BA-9 and the maximum reported concentration of TPH-d in soil was 290 mg/kg from the surface sample at location OAK-6C-1. The maximum lead concentration in soil was 1,400 mg/kg collected from location OAK-1BA-9 from 4.5 to 5 feet bgs. Ethylbenzene, toluene, and xylene were reported at low levels in most groundwater samples. The maximum concentration of TPH-g was 320 µg/L from location OAK-1BA-9.

2.3 GEOLOGY/HYDROGEOLOGY

The geologic deposits beneath the site have been mapped as the Merritt Sand. These deposits are described in the Phase I ESA for the site prepared by Engeo (Engeo,

1993) as loose, fined grained very well sorted beach and wind blown sand. Subsurface investigations conducted by ERM West on the site encountered fill in the upper 3 to 5 feet with the exception of boreholes B1 and B2 where fill was encountered down to the bottom of the boring at 15 feet. Concrete asphalt and brick were mixed with the fill materials. The native soils were logged as a medium brown sand with increasing amounts of clay with depth. Groundwater was measured at a depth of approximately 15 feet beneath the existing ground surface. Groundwater flow direction has been reported to be generally toward the south by PSI, the consultant that performed quarterly groundwater sampling from 1999 through 2001.

3.0 PROPOSED INVESTIGATIONS

The data collected from previous investigations at the site indicates that data gaps are apparent. This Section provides proposed activities and investigations to fill these gaps by: evaluating whether or not the source of contamination has been removed, performing a preferential pathway study for contaminants of concern, and conducting soil and groundwater sampling at the site.

3.1 CONTAMINATION SOURCE IDENTIFICATION

A review of historical information indicated that potential underground contamination sources may exist at the site. The geophysical investigation conducted by Norcal in 1995, indicated that five anomalies, labeled A, B, C, D, and E, were found below grade (see Appendix B). Anomalies A through C contained magnitudes and aerial extents typical of small USTs, or large isolated metallic objects such as utility vaults. Anomalies D and E contained magnitudes typical of isolated debris, as well zones of disturbed soils. Norcal indicated that the source of anomalies D and E are buried too deep to be further characterized by the GPR.

3.2 PREFERENTIAL PATHWAY STUDY

A utility map for the site and streets surrounding the site will be requested from the City of Oakland. This map will be used to create a cross-section map of the utilities on the site, indicating depths of these utilities across the site. The utility cross-sections in conjunction with site lithology will be used to assess whether or not the utilities at the site create a preferential pathway for contamination of soil and/or groundwater at the site. This utility cross-section map will also be used to discuss the probability of dissolved phase and potential NAPL plumes that may be affected by any conduits at the site.

3.3 TRENCHING

Trenching will be conducted at the site to further evaluate whether or not potential buried contamination sources exist within site soils. The trenches will:

- help explore the area in the vicinity of the potential contamination source(s), (based on historical site investigations, one hotspot appears to be located in the vicinity of MW-2),
- further investigate the anomalies found during the geophysical survey, and
- provide information for future remediation.

Eight trenches are proposed to be excavated at the site (see Plate 4). Six of the eight trenches will be 18 to 24 inches in width, twenty feet in length, and six to eight feet in depth (Anomalies A, B, C, and D). Two 60-feet long, by 18 to 24 inches wide, by six to eight feet deep trenches are proposed to be excavated parallel to Sixth Street in the vicinity of the former pump islands of Mahoney's Flying A Service and Gas Station. The trenches will be dug with the use of a backhoe. The soil collected in the backhoe bucket will be placed on plastic sheeting and stockpiled in a designated area. Soil from various trench areas will not be combined. Trench stockpiles will be covered with plastic sheeting as the trench is excavated.

Once the trenches reach the targeted dimensions, soil samples will be collected from the bottom and/or sidewalls of the trench; sample selection will be based on field observations such as staining/discoloration, odor, PID readings, or other evidence of contamination. Twelve samples are proposed to be collected; four-point composite and/or discrete depending on field observations. All 12 of the samples will be analyzed for VOCs via U.S. Environmental Protection Agency (EPA) Method 8260; TPH-g and TPH-d via EPA Method 8015M; CAM 17 metals via EPA Method 200.7; SVOCs via EPA Method 8270; and fuel oxygenates via EPA Method 8260. In addition, six of these samples (shallow samples) will also be analyzed for pesticides via EPA Method 8081; and polychlorinated biphenyls (PCBs) via EPA Method 8082.

Once the trench is completed and soil samples have been collected, the stockpiled soil will be used to backfill the trenches. The filled in soil will be compacted with the backhoe bucket equipped with a compaction device at one-foot intervals. Each trench will be backfilled the same day it was excavated.

3.4 SOIL BORING SAMPLING

A total of five direct-push borings (DP-1 through DP-5) will be advanced for the collection of soil and groundwater samples at the site (Plate 4). Locations DP-1 through DP-4 will assess potential contaminant migration from the vicinity of Well MW-2 to the middle of 6th Street, an area downgradient and poorly defined by previous sampling efforts. Location DP-5 is proposed to evaluate upgradient soil contamination that may be a residual source for the petroleum hydrocarbons reported in Well MW-2. These samples will be drilled a total depth of approximately 20 feet bgs. Soil samples are to be collected and logged continuously. The soil is to be field screened for the presence of VOCs using a photoionization detector (PID). The soil samples will be collected at approximately 12 to 15 feet bgs at proposed locations DP-1 through DP-4; this is the anticipated depth of the capillary fringe based on previous groundwater monitoring data. Two soil samples will be collected from proposed location DP-5, one at approximately four to six feet bgs (a possible source location) and one at the capillary fringe. Additional shallow samples are to be collected if the field screening indicates that VOCs are present. A groundwater sample will be collected from each boring, if attainable. Table 1 contains information about the proposed soil samples. The soil samples will be analyzed for VOCs via EPA) Method 8260; TPH-g, TPH-d, and silica gel cleanup via EPA Method 8015M; total organic carbon (TOC) via EPA Method 415.1; and fuel oxygenates via EPA Method 8260. Groundwater samples will be analyzed for VOCs via EPA Method 8260, TPH-g and TPH-d via EPA Method 8015M, and fuel oxygenates via EPA Method 8260.

3.5 MONITORING WELL SAMPLING AND DEVELOPMENT

There are currently three groundwater monitoring wells on-site, MW-1 through MW-3. These wells will be redeveloped prior to being sampled. Four additional wells, MW-4 through MW-7 are to be installed and developed (Plate 4). MW-4 (upgradient of historically elevated concentrations at Well MW-2) and MW-5 (downgradient of historically elevated concentrations at Well MW-2) are to be located on-site. MW-6 and MW-7 are to be located off-site across Sixth Street to monitor groundwater impacts downgradient of the release point. The wells will be two-inch wells and will be installed using a hollow-stem auger (HAS) drill rig to approximately 23 to 25 feet bgs; the screened interval will be approximately between 13 and 23 feet bgs (assuming first-encountered groundwater is at 15 feet bgs). Actual construction will be based on

field observations. Once installed, a licensed surveyor will survey the well casing elevation datum to the nearest 0.01 foot, along with horizontal coordinates as described in section 4.1.1. The new wells as well as existing wells will be monitored and sampled on a quarterly basis for a period of one year. Samples will be analyzed for the following constituents: VOCs in accordance with EPA Method 8260; TPH-g and TPH-d in accordance with EPA Method 8015M; fuel oxygenates in accordance with EPA Method 8260; and total dissolved solids (TDS) in accordance with Method 160.1. For the first quarter of the sampling program, natural attenuation parameters such as dissolved oxygen, nitrates/nitrites, sulfates/sulfites, ferrous iron etc. will be collected from the upgradient well (MW-4) and wells MW-2 and MW-5; these wells are likely to be within the groundwater plume.

4.0 FIELD ACTIVITIES

This section describes the field activities related to this investigation. The following topics are discussed:

- Field Preparation Activities
- Trenching Activities
- Soil and Groundwater Sampling
- Borehole Abandonment
- Monitoring Well Development, Installation, and Sampling
- Decontamination of Sampling Equipment
- Investigation-Derived Waste Management
- Traffic Control

The project activities will be conducted under the supervision of a California-licensed Professional Geologist (P.G.) or Professional Engineer (P.E.). Kleinfelder will only contract with state-licensed drillers and certified analytical laboratories.

4.1 FIELD PREPARATION ACTIVITIES

The following subsections present a description of the proposed boring and monitoring well locations and pre-drilling activities such as utility clearance and permitting.

4.1.1 Boring/Monitoring Well Locations

There are a total of five proposed boring locations, DP-1 through DP-5, and four proposed monitoring well locations, MW-4 through MW-7. Prior to advancement/installation, the boring/monitoring well locations will be marked in the field using white paint for utility search purposes as described in Section 4.1.2. The borings/wells will be advanced/installed at those locations once the utility search is cleared. After sampling is complete, boreholes and monitoring wells will be surveyed by a licensed surveyor in the State of California, consistent with requirements of the State Water Resources Control Board GeoTracker database requirements.

4.1.2 Utility Clearance

Utility maps will be obtained from the City of Oakland. Kleinfelder will also visit the site and mark the boring locations with white paint. Underground Service Alert will be notified a minimum of 48 hours prior to the initiation of the drilling activities. Geophysical methods (e.g. electromagnetic induction, magnetometry, and ground-penetrating radar) will be used, as appropriate, at each boring location in an attempt to locate potential subsurface obstructions prior to borehole advancement. In addition, a hand auger will be advanced (if soil conditions permit) approximately four to five feet bgs at each borehole location to manually check for utilities.

4.1.3 Permits

Kleinfelder will prepare and submit an application for soil borings and monitoring wells to the Alameda County Public Works Agency. The application will include proposed boring and well specifications, a detailed site map, and a site safety plan. No fees are required for this permit (as fees are waived for State agencies). An encroachment permit will be obtained from the City of Oakland, as needed.

4.2 FIELD SAMPLING ACTIVITIES

The following subsections present the methodology for collecting soil samples from trenches, collecting soil and groundwater samples from the proposed borings, and collecting groundwater samples from the existing and proposed groundwater monitoring wells.

4.2.1 Trenching

Eight trenches are proposed to be dug at the site (T-A, T-B, T-C, T-D1, T-D2, T-D3, T-E1 and T-E2,) as shown on Plate 4. A total of twelve soil samples will be collected from the trenches. The samples will be collected from the backhoe bucket with the use of a slide hammer. Based on field conditions, either discrete or four-point composite samples will be collected. The samples will be collected using stainless steel liners. Once each sample is collected, the liner will be covered with Teflon® sheets and capped with plastic end caps. The samples will be collected from various parts of the trench.

The samples will be sealed, labeled, and packaged for shipment under chain-of-custody protocol to the analytical laboratory as described in Section 5.1.

4.2.2 Soil Borings

Five direct-push soil borings will be advanced at the site (DP-1 through DP-5). Soil samples will be continuously collected by an experienced geologist, and logged in accordance with the Unified Soil Classification System. The soil samples will be collected using stainless steel or acetate liners. Two soil samples and one groundwater sample will be collected from location DP-5 and one soil sample and one groundwater sample will be collected from locations DP-1 through DP-4. Samples will be submitted to the analytical laboratory for analysis. Soil samples will be collected at the prescribed intervals of six to eight feet bgs and the capillary fringe (about 12 to 15 feet bgs) for location DP-5 and at the capillary fringe for locations DP-1 through DP-4, A grab groundwater sample will be collected at first-encountered groundwater from each of the five borings. Sample liners designated for laboratory analysis will be removed, and the ends will be covered with Teflon® sheets and capped with plastic end caps. Samples will be sealed, labeled, and packaged for shipment under chain-of-custody protocol to the analytical laboratory as described in Section 5.1.

4.2.3 Borehole Abandonment

All boreholes will be abandoned consistent with California Department of Water Resources Bulletin 74-81, Section 9 and Alameda County permit requirements. Following completion of the soil boring activities, boreholes will be sealed from bottom to top with neat cement grout (94 pound [42.6 kilogram] sack of Portland cement to 5 gallons [18.9 liters] of water).

4.2.4 Monitoring Well Installation, Development, and Sampling

There are currently three existing monitoring wells located at the site. Four new monitoring wells are proposed to be installed on- and off-site. The four new groundwater monitoring wells will be constructed as two-inch casing wells and drilled to an approximate total depth of 23 to 25 feet bgs. The screened interval is estimated to be between 13 and 23 feet bgs, assuming first-encountered groundwater is about 15 feet bgs.

Four two-inch groundwater monitoring-wells will be installed to a depth of approximately 25 feet using a hollow stem auger rig. Field observations and soil sampling will be performed as described for the soil borings. The borings for the wells will be advanced to approximately 23 to 25 feet bgs using 8-inch-diameter hollow stem augers. The wells will be constructed with up to 10 feet of 2-inch-diameter, schedule 40 polyvinyl chloride (PVC) flush threaded well screen with 0.020-inch slot. The annular space between the well screen and boring will be backfilled with No. 2/12 Lonestar sand-pack material to two feet above the well screen. Upon placement of the filter pack, at a minimum a 2-foot-thick annular seal will be constructed using bentonite pellets hydrated in place with potable water. Cement/bentonite grout will be placed from the bentonite seal to within about one foot of the ground surface. The wells will be completed as monument wells and fitted with a watertight locking cap.

After the concrete annular seal of the wells is allowed to cure for 24 to 48 hours, the wells will be developed to remove fine sediments from the well casing and the sand pack. Well-development will be performed by surging, bailing, and pumping water to remove sediment and turbid water from the well. During purging, measurements of temperature, conductivity, pH, and turbidity will be made at regular intervals. Field measurements and observations will be recorded on well development logs. Well development will continue until one of the following occurs: 1) at least three consecutive measurements of temperature, conductivity and pH are within 10 percent of each other; 2) groundwater appears relatively clear; or 3) a maximum of ten well volumes are removed.

Groundwater monitoring will be performed on a quarterly basis for one year on all existing and proposed monitoring wells (MW-1 through MW-7). Groundwater monitoring involves the measurement of the water level and collection of water quality samples from the wells. Initially, a water level reading will be taken with an electric contact probe. The depth of water will be measured from the top edge of the permanent PVC well casing. Prior to sampling, the wells will be purged such that a sample of water from the water bearing zone near the well is collected. The wells will be purged until at least three or a maximum of five well volumes of water have been removed and allowed to recover to near static levels before sampling. In addition, water quality parameters

such as pH, electric conductivity, and temperature will be measured to assess whether the water chemistry in the well has stabilized prior to sampling.

Groundwater samples will be collected using a disposable PVC bailer. Samples will be decanted into laboratory supplied glassware, sealed, labeled, and packaged for shipment under chain-of-custody protocol to the analytical laboratory as described in Section 5.1.

4.2.5 Decontamination of Sampling Equipment

The sampling equipment used to collect soil samples from the trenches will be cleaned between samples with tap water and soap and rinsed with deionized water. Prior to performing groundwater sampling activities in each well, the sampling equipment, such as water level meters and any other non-disposable equipment that may enter the well, will be pre-cleaned. This will be done in the following three stages: exposing the equipment to tap water, tap water with soap, and deionized water. Each decontamination stage will be performed in five minute intervals. Drilling equipment will be steam-cleaned between boreholes. Decontamination water will be contained in U.S. Department of Transportation (DOT)-approved barrels for later disposal, as appropriate.

4.2.6 Investigation-Derived Waste Management

Investigation-derived waste (IDW), for this project includes monitoring well purge water, decontamination rinsate fluids and soil cuttings. The liquid and the soil cuttings will be drummed separately and held at the site in labeled, DOT-approved, 55-gallon steel drums pending analytical results. Once the analytical results are obtained, IDW will be profiled and transported to a suitable recycling/disposal facility as soon as possible. Estimates of the number of samples and analyses required by the waste hauler (Dillard Environmental Services) are provided in Table 3.

4.2.7 Traffic Control

A traffic control plan will be prepared prior to starting any field work and carried out in the field. This plan will be used to control traffic in the areas where drilling is to be performed on or near the street. The traffic control plan provides general guidelines for

site safety measures, and will establish personnel protection standards and mandatory safety practices and procedures for conducting work in high traffic areas. The traffic control plan will be consistent with Caltrans specifications.

5.0 QUALITY ASSURANCE/QUALITY CONTROL

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

5.1 FIELD DOCUMENTATION

The following subsections present the QA/QC field procedures such as: recording field activities in a field log book; obtaining photo documentation; obtaining sample containers with preservative, if necessary, from the laboratory; obtaining sample labels for each sample container; recording samples collected on a chain-of-custody, and methods for making corrections to field documents.

5.1.1 Field Log Book

All field data will be recorded in a logbook while in the field. Logged data will include soil boring specifications, and sample-collection information including sample date, time, location, client, analytical methods, samplers' initials, and the name and address of the laboratory. In addition, any other pertinent information, such as conversations with concerned parties (site custodians, regulatory agency personnel) or descriptions of anomalous conditions will be recorded.

5.1.2 Field Data Sheets

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

5.1.3 Photo Documentation Record

Photographs will be taken of selected sampling locations to show the surrounding area, site features, and objects used to locate the site. The photographs will be used to provide backup documentation for procedures and unusual conditions encountered, as well as to identify general sampling locations. Photographs will be logged and placed into the report, as appropriate.

5.1.4 Sample Containers

Sample containers will be selected in accordance with U.S. EPA SW-846, Test Methods for Evaluating Solid Wastes Physical/Chemical Methods (U.S. EPA 2000). Groundwater samples will be collected in containers as listed in Table 2. The type of container will be determined by the analyte, required preservative, and amount of sample required for the analytical method. Sample containers for groundwater will be provided by the approved laboratory.

Soil samples will be collected in new, clean acetate liners, as listed in Table 2. The drilling subcontractor will provide sample liners. Sample containers will be inspected for cleanliness prior to use and will be rejected if found unacceptable.

5.1.5 Sample Labels

Sample labels will be completed in waterproof ink at the time of sample collection and before the sample is placed into the cooler. The following information will be included on the sample label: sample number, date and time, sample location and client, analysis and laboratory, preservative, samplers' initials, and project number.

5.1.6 Sample Preservation

Samples will be preserved in accordance with U.S. EPA SW-846, Test Methods for Evaluating Solid Wastes Physical/Chemical Methods (U.S. EPA 1996). Field samples and associated QC samples requiring cooling will be maintained at approximately 4 degrees Celsius until shipment to the laboratory. Table 2 lists the required preservation methods for groundwater and soil samples, respectively.

5.1.7 Sample Packaging and Shipment

Soil and groundwater samples collected for analysis will be place into the appropriate container (Table 2), labeled, and placed into a Ziploc™ bag. The samples will then be placed into an ice chest with water ice to 4 +/- 2 °C. At the end of each day, the field crew will relinquish the custody of the samples to a courier from Torrent Laboratory, Inc., who will deliver the samples to the laboratory the same day.

5.1.8 Chain-of-Custody Records

Chain of custody (COC) records will document the transfer of sample custody from the time of sampling to laboratory receipt. COC forms will be completed by the sampler and will accompany the samples from the field to the analytical laboratory.

The custody record will be completed using waterproof ink. All corrections will be made by drawing a line through, initialing, and dating the error, and then entering the correct information. The error will remain legible after correction. All applicable information on the COC record, including signatures, will be filled out completely and legibly. Unused space (rows) for sample/analysis information will be crossed out, initialed, and dated.

5.1.9 Corrections to Documentation

All original recorded data will be written in waterproof ink. No accountable, serialized documents will be destroyed or thrown away, even if they are illegible or contain inaccuracies that require a replacement document. If an error is made on an accountable document assigned to an individual, that individual will correct the error by drawing a line through it, initialing it, and entering the correct information. The erroneous information will not be obliterated. Any subsequent error discovered on a document will be corrected, initialed, and dated by the person who made the entry.

5.2 FIELD QUALITY ASSURANCE/QUALITY CONTROL

QA/QC samples will be collected during field sampling activities. The QA/QC samples for groundwater will include one duplicate groundwater sample, one matrix spike/matrix spike duplicate (MS/MSD) sample, and one trip blank sample. The trip blank sample will be collected to assess whether VOCs and/or TPH-purgeables were introduced during sample handling and shipment. The QA/QC samples for soil will include one MD/MSD sample. Due to the heterogeneous nature of soil, collection of a duplicate sample is not be appropriate and thus will not be collected.

For the additional three quarters of groundwater sampling, one duplicate, one MS/MSD, and one trip blank sample will be collected for each sampling event.

5.3 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL

All analytical testing will be performed by Torrent Laboratory, Inc., (located in Milpitas, California) a fixed-based laboratory, accredited by the California Environmental Protection Agency (Cal/EPA) Environmental Laboratory Accreditation Program (ELAP). The laboratory will be responsible for maintaining custody of the samples, and for maintaining all associated records documenting that custody. Upon receipt of the samples, the laboratory will check the original chain-of-custody documents and compare them with the labeled contents of each sample container for accuracy and traceability. The laboratory will check all sample containers for integrity, and will record any observations on the original chain-of-custody record; the chain-of-custody form will be signed and dated by the laboratory.

Each sample will be logged into the laboratory by assigning it a unique sample number. All samples received as part of the same shipment will receive the same work order. Appending sequential letters to the end of the sample number identifies each container of the sample. The laboratory number and the sample ID number will be recorded on the laboratory report.

The laboratory quality control samples will be analyzed in accordance with referenced analytical method protocols to verify that laboratory procedures are conducted properly and that the quality of the data is known.

6.0 REPORT PREPARATION

Following completion of the investigative field activities and receipt of the analytical results of soil and groundwater samples, a Data Gap Report will be prepared to document the activities, findings, conclusions, and recommendations. The report will be submitted to Caltrans for submittal to the ACEHS. The report will include:

- Introduction, purpose and objectives of the investigation;
- Background information;
- Site description including surface features, soil, and geology;
- Description of information obtained regarding the source of contamination at the site;
- Results of the preferential pathway study;
- Description of the concentrations of concern in soil and groundwater at the proposed sampling locations;
- Presentation of soil and groundwater analytical results (tables and plates) in the context of regulatory agency action levels and guidelines;
- Certified laboratory analytical reports and chain-of-custody records;
- Description of field and laboratory QA/QC procedures;
- Drafted boring and trench logs; and
- Conclusions and recommendations.

The investigation and the report preparation will be conducted under the direct supervision of and will be signed by a California P.G. or P.E. Following submittal of the report to ACEHS, the report will also be uploaded to the State Water Resources Control Board GeoTracker database.

Quarterly sampling reports will also be provided for each of the three additional sampling quarters.

7.0 PROPOSED SCHEDULE

Kleinfelder will begin implementation of this Work Plan as soon as approval has been received from Caltrans. The field work will commence within two weeks of approval, contingent on driller availability. The field preparation activities will be completed first, including securing the required permits, approvals from regulatory agencies, and preparation of a traffic control plan. Kleinfelder will then schedule the utility clearance and drilling subcontractors. The actual fieldwork is anticipated to be performed within one week, laboratory turnaround of one to two weeks, and report preparation two to three weeks. The overall duration of this data gap investigation is anticipated to be 10 weeks.

Quarterly sampling reports will be provided four weeks following receipt of analytical results.

8.0 HEALTH AND SAFETY

The Federal OSHA and California Department of Safety and Health (DOSH) require that a site-specific HASP be prepared prior to field activities (29 CFR Part 1910.120[j]; Title 8, CCR, Section 5192). In addition, Kleinfelder safety policy dictates that a HASP be generated for use by the Kleinfelder field team because the potential for exposure to hazardous materials exists. All Kleinfelder field personnel and subcontractors working directly in the field will be enrolled in a medical monitoring surveillance program.

The site-specific HASP provides general guidelines for decision points in site safety planning, and will establish personnel protection standards and mandatory safety practices and procedures.

In general, the HASP covers the following subjects:

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

The provisions of the HASP are mandatory for all onsite personnel; all Kleinfelder subcontractors shall conform to this plan at a minimum. The HASP for the proposed work is included in Appendix D.

9.0 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 Caltrans personnel 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. Information gathered by Kleinfelder is considered confidential and will be released only upon written authorization of Caltrans or as required by law. Non-compliance with any of these requirements by Caltrans 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. Caltrans 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. Performing extensive studies, including subsurface investigations or field tests, would reduce uncertainties. Acceptance of this report will indicate that Caltrans 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, chemicals of potential concern (COPCs) 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 COPCs being encountered or present on the project site, or from the discovery of such COPCs. 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

COPCs within the meaning of any governmental statute, regulation or order. Caltrans will be solely responsible for notifying all governmental agencies, and the public at large, of the existence, release, treatment or disposal of any COPCs observed at the project site, either before or during performance of 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 Caltrans 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 Client. Consequently, no warranty or guarantee, expressed of implied, is intended or made.

10.0 REFERENCES

Caltrans. 2002. Vacant Parcel Located at the Intersection of 6th and Castro Streets, Oakland, CA. Letter to Mr. Don Hwang, Alameda County Environmental Health Department. July 18.

Engeo Incorporated (Engeo), 1993. Phase I Environmental Site Assessment, Sixth Street and Castro Street Parcel, Oakland, California. January 27.

ERM-West, 2001. Site Investigation Workplan, California Department of Transportation District 4 Excess Land, Sixth and Castro Street, Oakland, California. August 6.

Geocon, Incorporated (Geocon), 1995. Summary of Soil and Groundwater Results, Caltrans District 4 Excess Land, Oakland, CA, October 9.

International Technology Corporation (ITC), 1996. Boring Logs and Locations and Detected Analytes in Soil and Groundwater, Oakland Site, Sixth Street and Castro Street. October 15.

Norcal Geophysical Consultants, Inc. (Norcal), 1995. Geophysical Survey Investigation. September 1.

PSI, 1999. Summary of Groundwater Analytical Data, State Right-of-Way, Sixth and Castro Streets, Oakland, California. October 25.

PSI, 2000a. Summary of Groundwater Analytical Data, State Right-of-Way, Sixth and Castro Streets, Oakland, California. February 7.

PSI, 2000b. Summary of Groundwater Analytical Data, State Right-of-Way, Sixth and Castro Streets, Oakland, California. April 27.

PSI, 2000c. Summary of Groundwater Analytical Data, State Right-of-Way, Sixth and Castro Streets, Oakland, California. August 8.

PSI, 2000d. Summary of Groundwater Analytical Data, State Right-of-Way, Sixth and Castro Streets, Oakland, California. November 16.

PSI, 2001. Summary of Groundwater Analytical Data, State Right-of-Way, Sixth and Castro Streets, Oakland, California. March 27.

U.S. EPA. 1996. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846), Update III. Office of Solid Waste and Emergency Response. Washington DC. December.

TABLES

Table 1
Proposed Sample Locations, Depths, and Analyses
Caltrans District 4 Property
Sixth Street and Castro Street,
Oakland, California

Boring ID	Maximum Boring Depth (feet)	Media	Sample Depths (feet)	Laboratory Analyses
Trenching Samples				
T-1	6.0 - 8.0	Soil	NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; CAM 17 metals by EPA 200.7; and SVOCs by EPA 8270
T-2	6.0 - 8.0	Soil	NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; CAM 17 metals by EPA 200.7; and SVOCs by EPA 8270
T-3	6.0 - 8.0	Soil	NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; CAM 17 metals by EPA 200.7; and SVOCs by EPA 8270
T-4	6.0 - 8.0	Soil	NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; CAM 17 metals by EPA 200.7; and SVOCs by EPA 8270
T-5	6.0 - 8.0	Soil	NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; CAM 17 metals by EPA 200.7; and SVOCs by EPA 8270
T-6	6.0 - 8.0	Soil	NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; CAM 17 metals by EPA 200.7; and SVOCs by EPA 8270
T-7	6.0 - 8.0	Soil	NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; CAM 17 metals by EPA 200.7; SVOCs by EPA 8270; pesticides by EPA 8081; PCBs by EPA 8082
T-8	6.0 - 8.0	Soil	NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; CAM 17 metals by EPA 200.7; SVOCs by EPA 8270; pesticides by EPA 8081; PCBs by EPA 8082
T-9	6.0 - 8.0	Soil	NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; CAM 17 metals by EPA 200.7; SVOCs by EPA 8270; pesticides by EPA 8081; PCBs by EPA 8082
T-10	6.0 - 8.0	Soil	NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; CAM 17 metals by EPA 200.7; SVOCs by EPA 8270; pesticides by EPA 8081; PCBs by EPA 8082
T-11	6.0 - 8.0	Soil	NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; CAM 17 metals by EPA 200.7; SVOCs by EPA 8270; pesticides by EPA 8081; PCBs by EPA 8082
T-12	6.0 - 8.0	Soil	NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; CAM 17 metals by EPA 200.7; SVOCs by EPA 8270; pesticides by EPA 8081; PCBs by EPA 8082
Boring Samples				
DP-1	20.0	Groundwater	15.0	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M
		Soil	capillary fringe	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; Silica Gel Cleanup; Total Organic Carbon
DP-2	20.0	Groundwater	15.0	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M
		Soil	capillary fringe	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; Silica Gel Cleanup; Total Organic Carbon
DP-2 MS/MSD	20.0	Soil	capillary fringe	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; Silica Gel Cleanup; Total Organic Carbon
DP-3	20.0	Groundwater	15.0	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M
		Soil	capillary fringe	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; Silica Gel Cleanup; Total Organic Carbon
DP-4	20.0	Groundwater	15.0	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M
		Soil	capillary fringe	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; Silica Gel Cleanup; Total Organic Carbon
DP-5	20.0	Soil	6.0 - 8.0	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; Silica Gel Cleanup; Total Organic Carbon
		Groundwater	15.0	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M
		Soil	capillary fringe	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; Silica Gel Cleanup; Total Organic Carbon
Groundwater Monitoring Wells: Quarters 1 - 4				
MW-1	25.0	Groundwater	NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; TDS
MW-2	25.0		NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; TDS; General Chemistry Panel for First Quarter Sampling Event Only
MW-3	25.0		NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; TDS
MW-4	25.0		NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; TDS; General Chemistry Panel for First Quarter Sampling Event Only
MW-5	25.0		NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; TDS; General Chemistry Panel for First Quarter Sampling Event Only
MW-5 MS/MSD	25.0		NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; TDS
MW-6	25.0		NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; TDS
MW-6 Duplicate	25.0		NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; TDS
MW-7	25.0		NA	VOCs and fuel oxygenates by EPA 8260; TPH-g and TPH-d by EPA 8015M; TDS

Notes:
NA = not applicable
EPA = Environmental Protection Agency
MS/MSD = Matrix Spike/Matrix Spike Duplicate
VOCs = Volatile Organic Compounds
TPH-g = Total Petroluem Hydrocarbons as gasoline
TPH-d = Total Petroluem Hydrocarbons as diesel

Table 2
Sample Container, Holding Time, and Preservative Requirements
Caltrans District 4 Property
Sixth Street and Castro Street,
Oakland California

Parameter	Method/Reference	Sample Container	Preservation	Holding Time	
				Extraction	Analysis
Soils Samples					
Volatile Organic Compounds	EPA 8260	6-inch stainless steel or acetate liner	Cool 4 ± 2ºC	48 hours for analysis	14 days
Total Petroleum Hydrocarbons - Gasoline	EPA 8015B	6-inch stainless steel or acetate liner	Cool 4 ± 2ºC	48 hours for analysis	14 days
Total Petroleum Hydrocarbons - Diesel	EPA 8015B	6-inch stainless steel or acetate liner	Cool 4 ± 2ºC	48 hours for analysis	14 days
Fuel Oxygenates	EPA 8260	6-inch stainless steel or acetate liner	Cool 4 ± 2ºC	48 hours for analysis	14 days
CAM 17 Metals	EPA 200.7	6-inch stainless steel or acetate liner	Cool 4 ± 2ºC	48 hours for analysis	14 days
Silica Gel Cleanup	EPA 8015B	6-inch stainless steel or acetate liner	Cool 4 ± 2ºC	48 hours for analysis	14 days
Total Organic Carbon	EPA 415.1	6-inch stainless steel or acetate liner	Cool 4 ± 2ºC	48 hours for analysis	14 days
Semi Volatile Organic Compounds	EPA 8270	6-inch stainless steel or acetate liner	Cool 4 ± 2ºC	48 hours for analysis	14 days
Pesticides	EPA 8081	6-inch stainless steel or acetate liner	Cool 4 ± 2ºC	48 hours for analysis	14 days
Polychlorinated Biphenyls	EPA 8082	6-inch stainless steel or acetate liner	Cool 4 ± 2ºC	48 hours for analysis	14 days

Table 2
Sample Container, Holding Time, and Preservative Requirements
Caltrans District 4 Property
Sixth Street and Castro Street,
Oakland California

Parameter	Method/Reference	Sample Container	Preservation	Holding Time	
				Extraction	Analysis
Groundwater Samples					
Volatile Organic Compounds	EPA 8260	Three 40-mL glass vias with Teflon® Septa	HCl to pH < 2, cool 4 ± 2ºC, no headspace	48 hours for analysis	14 days
Total Petroleum Hydrocarbons - Gasoline	EPA 8015B	Three 40-mL glass vias with Teflon® Septa	HCl to pH < 2, cool 4 ± 2ºC, no headspace	48 hours for analysis	14 days
Total Petroleum Hydrocarbons - Diesel	EPA 8015B	One Liter amber glass with Teflon-lined septa cap	HCl to pH < 2, cool 4 ± 2ºC	48 hours for analysis	14 days
Fuel Oxygenates	EPA 8260	6-inch stainless steel or acetate liner	Cool 4 ± 2ºC	48 hours for analysis	14 days
Total Dissolved Solids	EPA 160.1	One 500 mL poly	Cool 4 ± 2ºC	48 hours for analysis	14 days

Notes:
EPA = U.S. Environmental Protection Agency
^{o}C = degrees Celsius
mL = milliliter
HCL = hydrochloric acid

Table 3
Investigation Derived Waste Samples
Caltrans District 4 Property
Sixth Street and Castro Street,
Oakland California

Sample ID	Parameter	Methods	Sample Type	Sample Container	Preservation	Holding Time	
						Extraction	Analysis
Soils Samples							
SW-1	CAM 17 Metals	EPA 200.7	One 3-point composite sample from soil drums 1, 2, and 3	6-inch stainless steel or acetate liner	Cool 4 ± 2ºC	48 hours for analysis	14 days
	SVOCs	EPA 8270/625					
	STLC - Cr, Pb, Ni, Zn	Title 22, Chapter 11, Article 3					
SW-2	CAM 17 Metals	EPA 200.7	One 4-point composite sample from soil drums 4, 5, 6, and 7	6-inch stainless steel or acetate liner	Cool 4 ± 2ºC	48 hours for analysis	14 days
	SVOCs	EPA 8270/625					
	STLC - Cr, Pb, Ni, Zn	Title 22, Chapter 11, Article 3					

Notes:

EPA: U.S. Environmental Protection Agency

NA: Not applicable because not extraction is required.

SVOC: Semivolatile Organic Compounds

STLC: soluble threshold limit concentration (Waste extraction test to be performed and specific elements tested, as necessary)

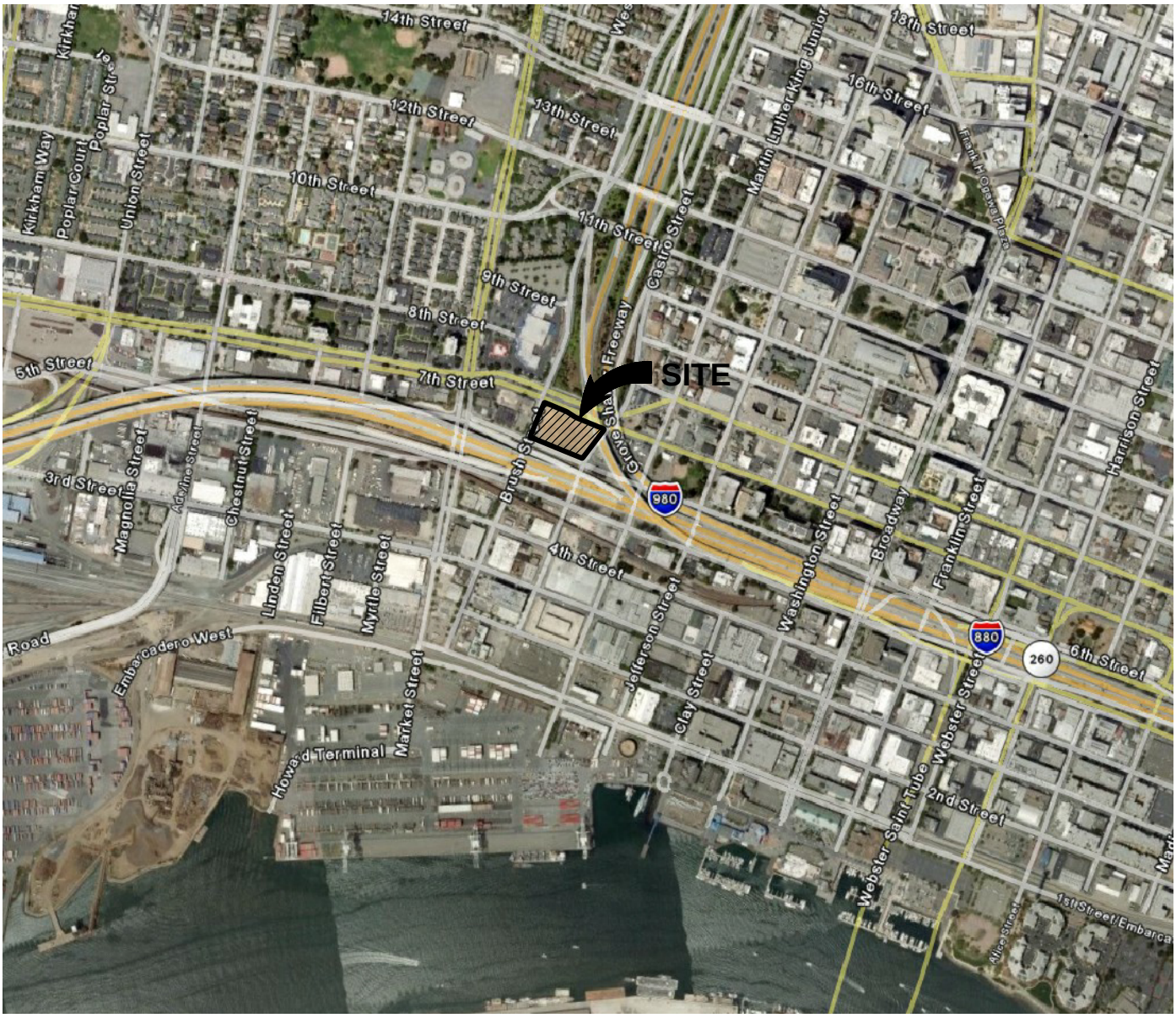
Cr: Chromium

Pb: Lead

Ni: Nickel

Zn: Zinc

PLATES



1000 500 0 1000

APPROXIMATE SCALE (feet)

N

REFERENCE:
www.google.com, 2006

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

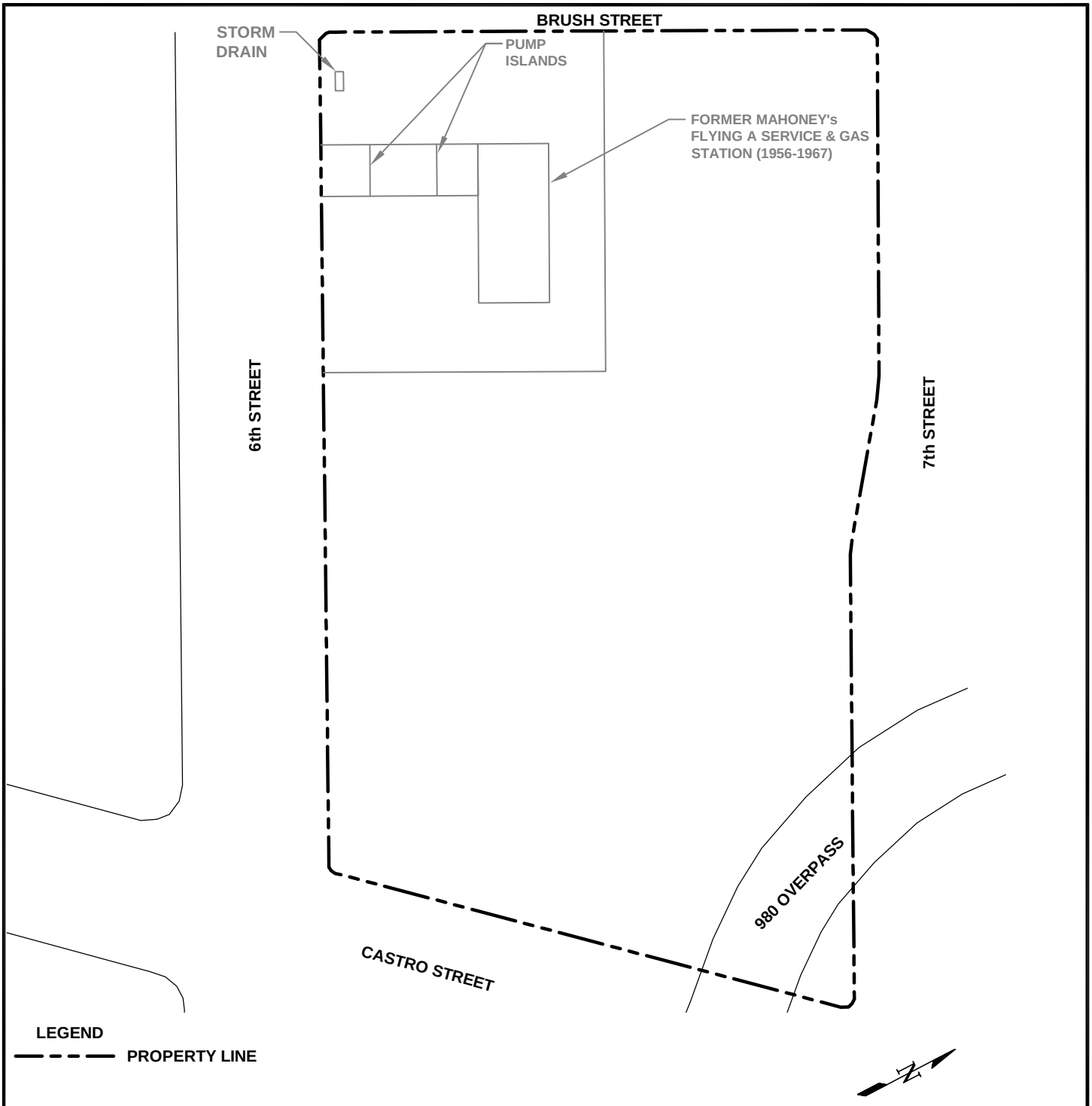
PROJECT NO.	94149
DRAWN:	MAY 2008
DRAWN BY:	JDS
CHECKED BY:	CR
FILE NAME:	VIC-PLAN.dwg

SITE VICINITY MAP

CALTRANS DISTRICT 4 EXCESS LAND
SIXTH STREET AND CASTRO STREET
OAKLAND, CALIFORNIA

PLATE **1**

ATTACHED IMAGES: Images: caltrans fig.jpg Images: plate 3.jpg Images: plate 4.jpg Images: SITE-VIC.jpg Images: SITEPLAN.jpg
ATTACHED XREFS: XRef: Eng-A_8x11_P_StyleA
PLEASANTON, CA CAD FILE: D:_PROJECTS\94149-3\ LAYOUT: SITE-VIC
PLOTTED: 29 May 2008, 9:44am, jsala



REFERENCE:
Engeo Inc., Site Plan, dated January 1993
ERM, Site Plan, dated August, 2001

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

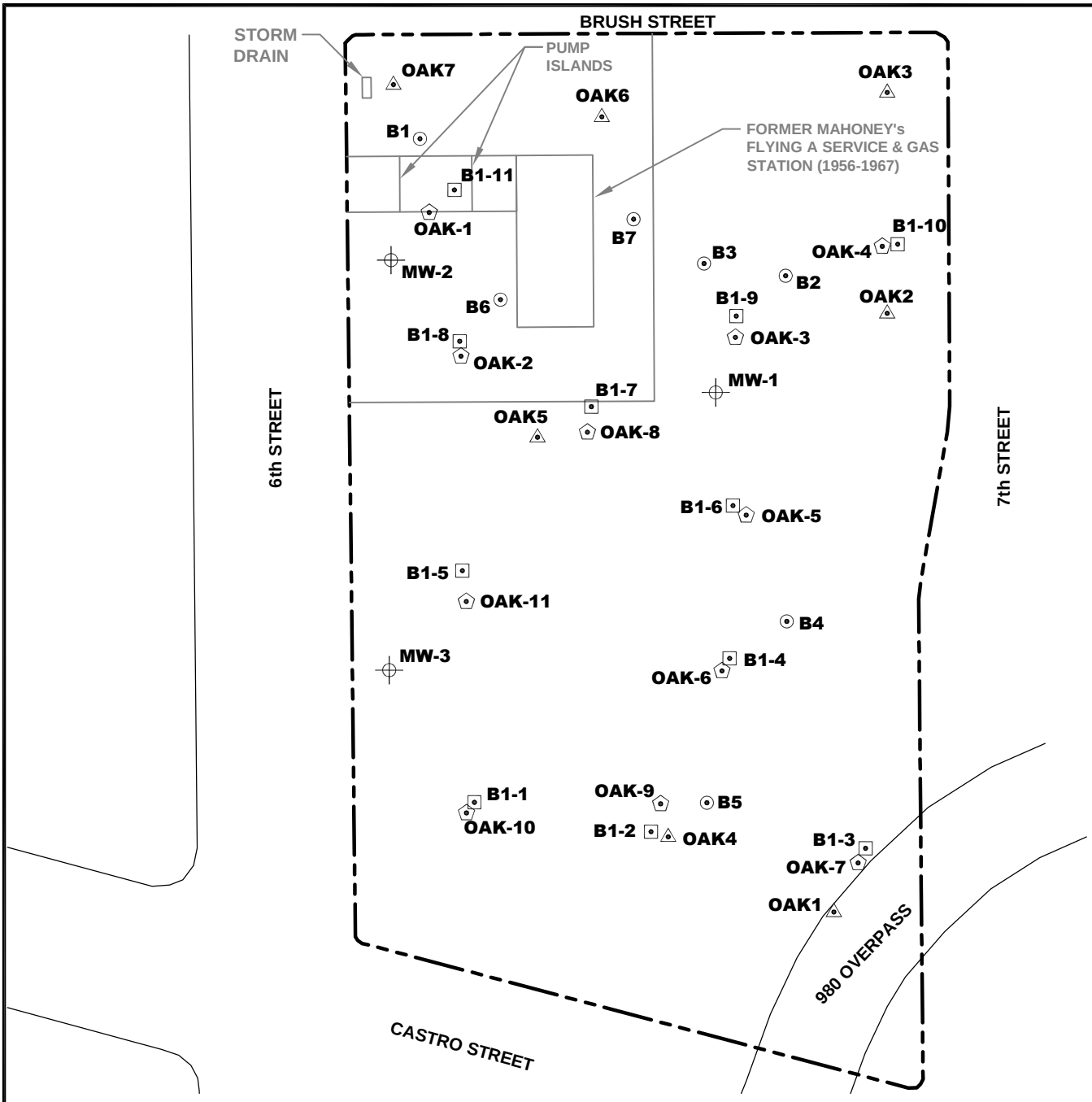
PROJECT NO.	94149
DRAWN:	MAY 2008
DRAWN BY:	JDS
CHECKED BY:	CR
FILE NAME:	VIC-PLAN.dwg

SITE PLAN

CALTRANS DISTRICT 4 EXCESS LAND
SIXTH STREET AND CASTRO STREET
OAKLAND, CALIFORNIA

PLATE **2**

ATTACHED IMAGES: Images: caltrans fig.jpg Images: plate 3.jpg Images: plate 4.jpg Images: SITE-VIC.jpg Images: SITEPLAN.jpg
ATTACHED XREFS: XRef: Eng-A_8x11_P_StyleA
PLEASANTON, CA CAD FILE: D:_PROJECTS\94149-3\ LAYOUT: SITEPLAN
PLOTTED: 29 May 2008, 9:44am, jsala



LEGEND

- PROPERTY LINE
- BORING LOCATION (By ERM-WEST, 1987)
- BORING LOCATION (By Geocon, 1995)
- BORING LOCATION (By IT corporation, 1996)
- BORING LOCATION (By PSI, 1999)
- WATER MONITORING WELL LOCATION (By PSI, 1999)

60 30 0 60

APPROXIMATE SCALE (feet)

REFERENCE:
Engeo Inc., Site Plan, dated January 1993
ERM, Site Plan, dated August, 2001

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

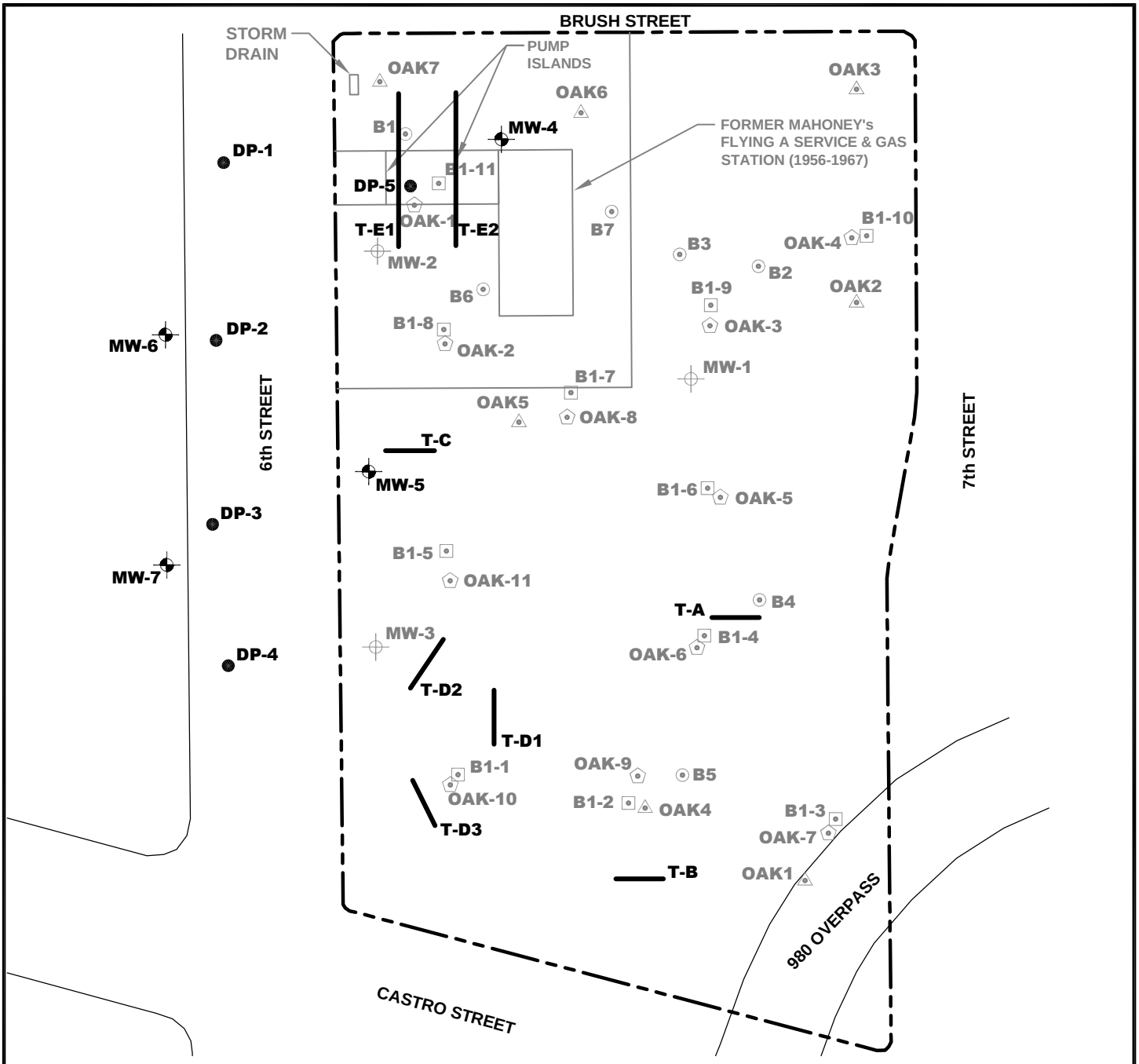
PROJECT NO.	94149
DRAWN:	MAY 2008
DRAWN BY:	JDS
CHECKED BY:	CR
FILE NAME:	VIC-PLAN.dwg

SITE PLAN WITH HISTORICAL SAMPLE LOCATIONS

CALTRANS DISTRICT 4 EXCESS LAND
SIXTH STREET AND CASTRO STREET
OAKLAND, CALIFORNIA

PLATE **3**

ATTACHED IMAGES: Images: caltrans fig.jpg Images: plate 3.jpg Images: plate 4.jpg Images: SITE-VIC.jpg Images: SITEPLAN.jpg
ATTACHED XREFS: XRef: Eng-A_8x11_P_StyleA
PLEASANTON, CA CAD FILE: D:_PROJECTS\94149-3\ LAYOUT: HISTORICAL
PLOTTED: 29 May 2008, 9:44am, jsala



LEGEND

- PROPERTY LINE
- BORING LOCATION (By ERM-WEST, 1987)
- BORING LOCATION (By Geocon, 1995)
- BORING LOCATION (By IT corporation, 1996)
- PROPOSED TRENCHES
- A, B, C, D, E ANOMALIES LOCATED DURING GEOPHYSICAL
- BORING LOCATION (By PSI, 1999)
- WATER MONITORING WELL LOCATION (By PSI, 1999)
- PROPOSED DIRECT PUSH SAMPLE LOCATION
- PROPOSED SOIL BORING/MONITORING WELL LOCATION (By Kleinfelder, 2008)

60 30 0 60

APPROXIMATE SCALE (feet)

REFERENCE:
Engeo Inc., Site Plan, dated January 1993
ERM, Site Plan, dated August, 2001

ATTACHED IMAGES: Images: caltrans fig.jpg Images: plate 3.jpg Images: plate 4.jpg Images: SITE-VIC.jpg Images: SITEPLAN.jpg
ATTACHED XREFS: XRef: Eng-A_8x11_P_StyleA
PLEASANTON, CA CAD FILE: D:_PROJECTS\94149-3\ LAYOUT: PROPOSED
PLOTTED: 29 May 2008, 9:44am, jsala

KLEINFELDER
Bright People. Right Solutions.
www.kleinfelder.com

PROJECT NO.	94149
DRAWN:	MAY 2008
DRAWN BY:	JDS
CHECKED BY:	CR
FILE NAME:	VIC-PLAN.dwg

SITE PLAN WITH PROPOSED SAMPLE LOCATIONS

CALTRANS DISTRICT 4 EXCESS LAND
SIXTH STREET AND CASTRO STREET
OAKLAND, CALIFORNIA

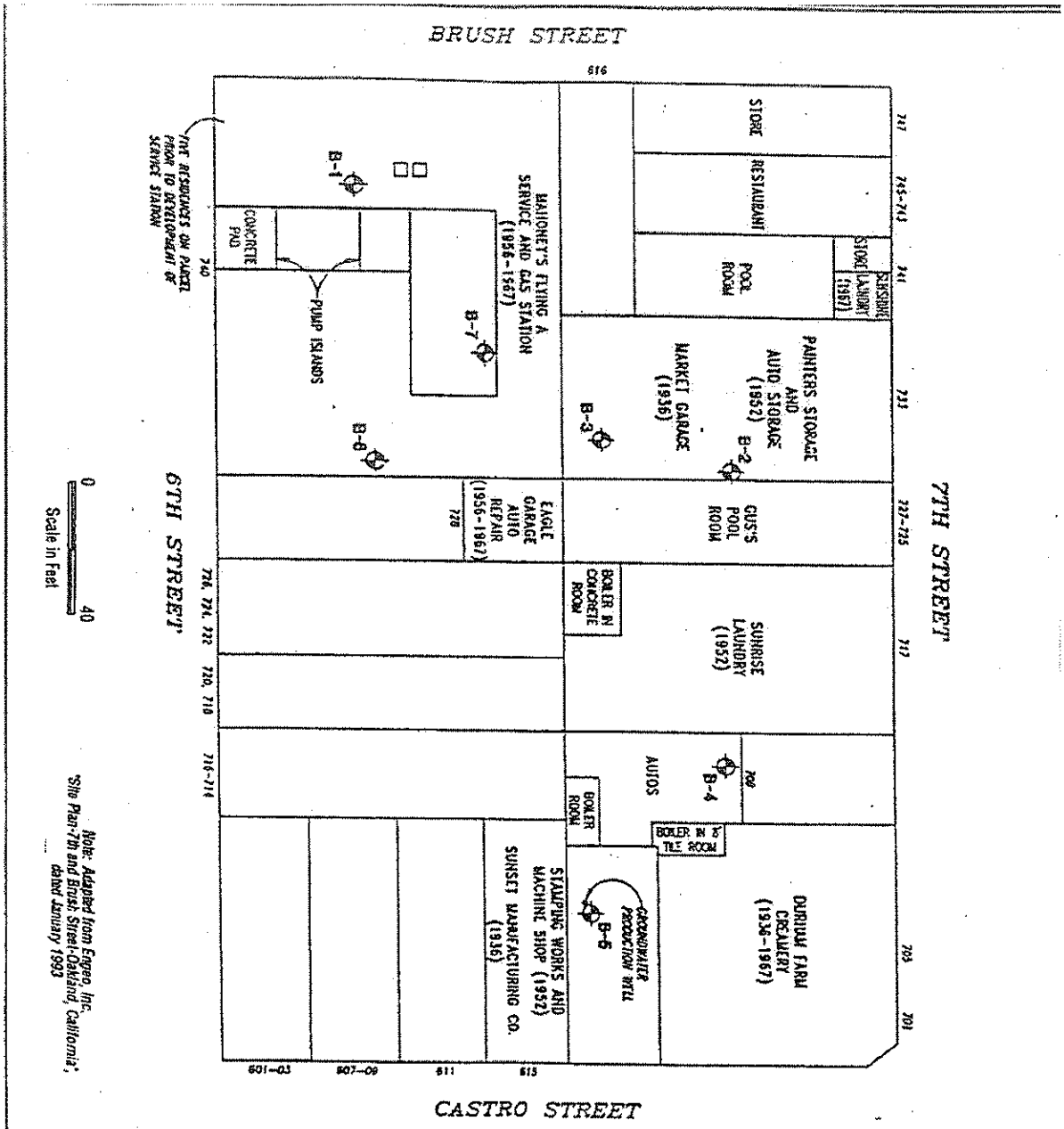
PLATE **4**

APPENDIX A

HISTORICAL SITE PLAN

ATTACHMENT B

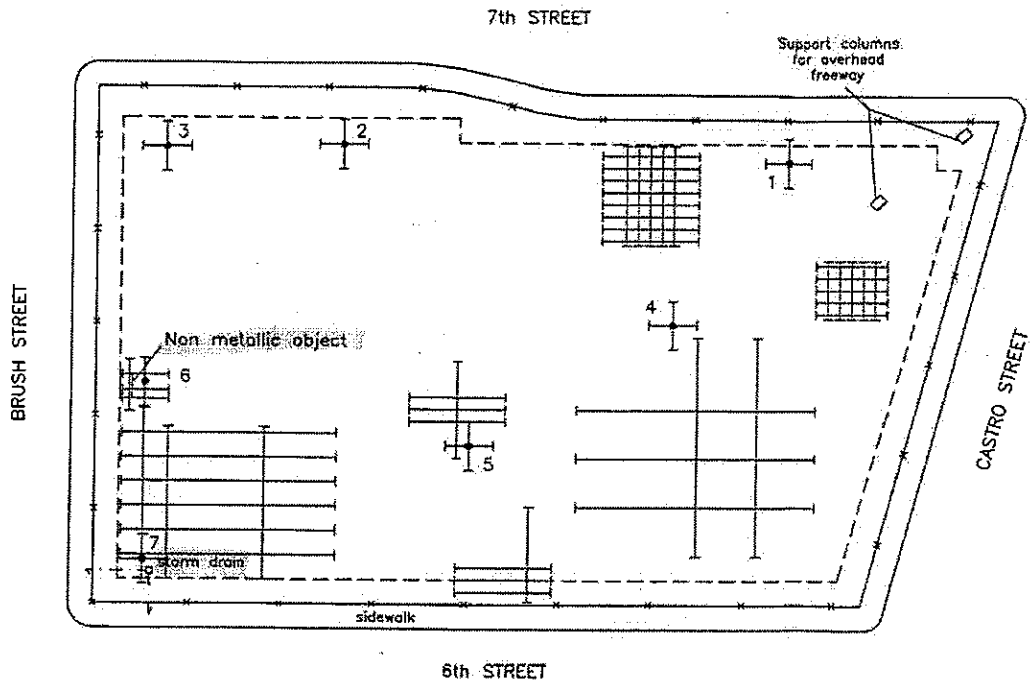
HISTORICAL SITE PLAN



PSI Environmental Geotechnical Construction Consulting • Engineering • Testing 1320 W. Winton Avenue Hayward, CA 94545	PROJECT NAME: Sixth and Castro Oakland, California PROJECT NO: 575-9G034	FIGURE 8 HISTORICAL SITE PLAN	N

APPENDIX B

LOCATION OF GEOPHYSICAL INVESTIGATION AND VERTICAL MAGNETIC GRADIENT CONTOUR MAP



NORTH

0 50 100

SCALE (FT)

LEGEND

- GPR Traverse
- Extent of VMG survey
- Utility line
- Fence
- 1 Approximate location of proposed borings based on GEOCON site map

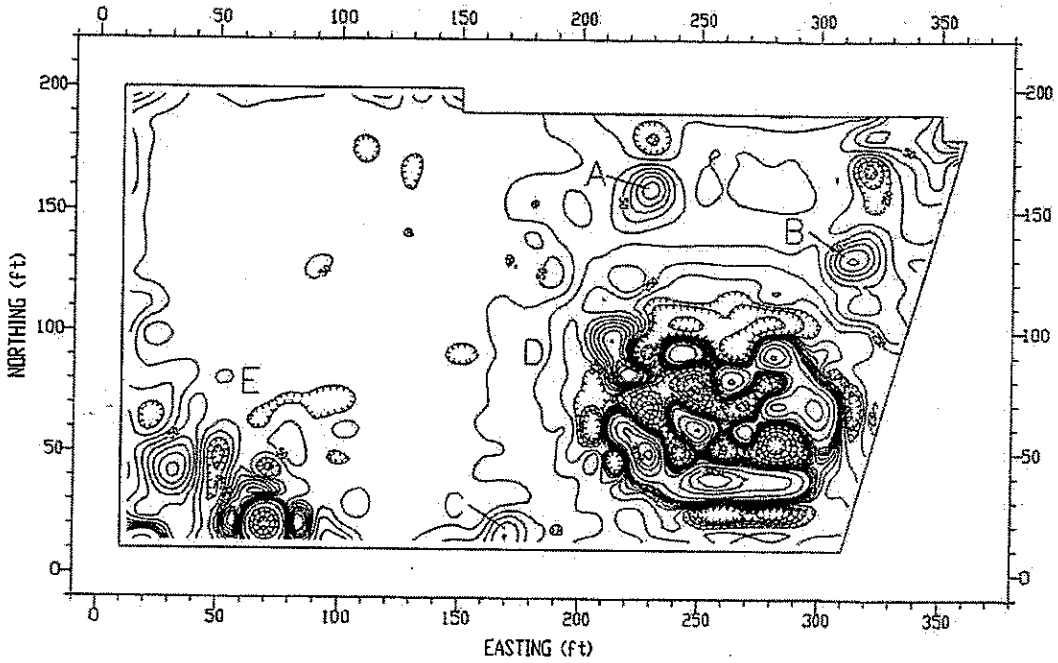
OAKLAND SITE LOCATION MAP

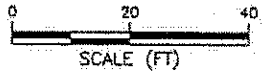
Geophysical Investigation
6th and Brush Streets
Oakland, California

NORCAL GEOPHYSICAL CONSULTANTS INC.

PLATE 2

JOB: 95-285.03 | APPR: DSK | DATE: 7/95





LEGEND

Vertical Magnetic Gradient Contour
Contour interval = 100 g/m

OAKLAND SITE
VERTICAL MAGNETIC GRADIENT CONTOUR MAP

Geophysical Investigation
8th and Brush Streets
Oakland, California

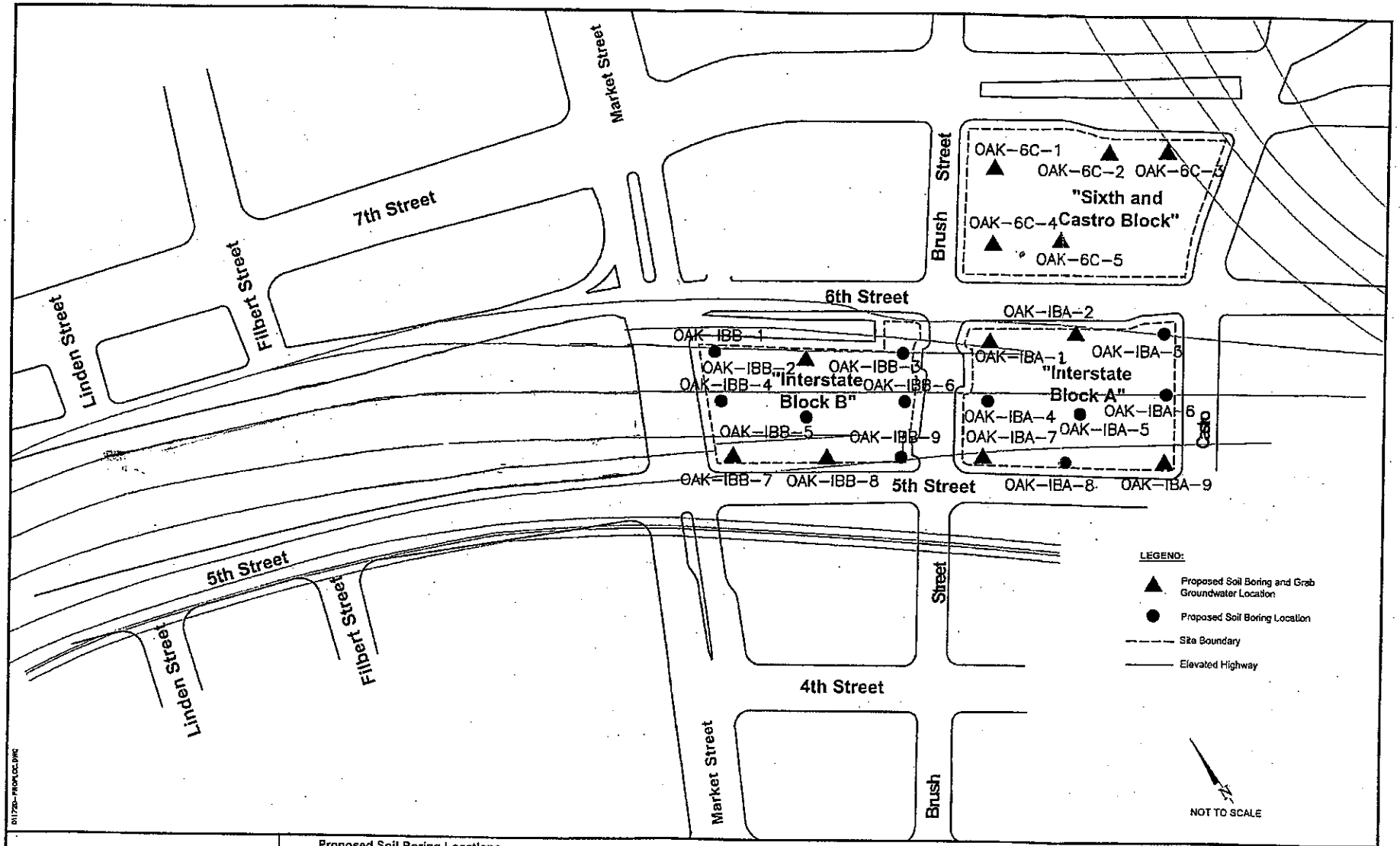
NORCAL GEOPHYSICAL CONSULTANTS INC.

PLATE 4

JOB: 95-285.03 | APPR: DJK | DATE: 8/95

APPENDIX C

IRIS ENVIRONMENTAL BORING LOCATIONS



IRIS ENVIRONMENTAL 1515 Broadway, Suite 1003, Oakland, California 94612	Proposed Soil Boring Locations CalTrans Properties Port of Oakland Oakland, California	Figure 2
Drafter: MAS	Date: 8/24/01	Contract Number: 00-1728
Approved:	Revised:	

ATTACHMENT 2

APPENDIX D

HEALTH AND SAFETY PLAN

HEALTH AND SAFETY PLAN

Project No. 94149/1 **Date** 05-20-2008

Client Caltrans
111 Grand Avenue, 14th Floor
Oakland, CA 94623

Address Sixth Street and Castro Street
Oakland, CA

Site Contact Charles Smith **Phone No.** 510.286.5635

Job Location Sixth Street and Castro Street, Oakland, CA

Work Objectives Advancement of five borings, installation of four monitoring wells, excavation of eight trenches, development of existing monitoring wells, and soil and groundwater sampling.

Key Individuals: Jeff Graveson

Project Manager: Charlie Almestad (510) 628-9000 x219

Site Health and Safety: Jeff Graveson

Project Health and Safety Officer: Jenny Meyer, CIH (303) 953-6922 (cell (303) 419-5913)

Prepared by: Cynthia Ruelas **Reviewer/Approver:** Charlie Almestad

Hospital/Clinic: Alta Bates Medical Center

Phone No.: (510) 204-4444

Address: 350 Hawthorne Avenue

Paramedic 911 **Fire Dept.** 911 **Police Dept.** 911

Emergency/Contingency Plans: Stop work and evaluate situation. Shut down heavy equipment and assess the situation. Notify health and safety officer or site project manager. Emergency situations that involve injuries or illness must stabilize the victims and apply first aid and/or seek medical aid as necessary. Move injured personnel only if injuries permit. Call Ambulance and/or Medical Personnel to transport injured to hospital. Alta Bates Medical Center is located approximately 2.3 miles north at 350 Hawthorne Avenue in Oakland. Refer to Figure 1 for location of nearest emergency medical facility site. Health and safety officer and/or to notify Client and appropriate personnel of situation.

15 Minute Eyewash Not Required **Fire Extinguisher** Required

First Aid Kit Required

Site Control Measures: Keep unauthorized people away from work area by establishing a clearly defined work zone ("exclusion area") as appropriate using barricade tape and/or traffic cones. Traffic cones shall be used whenever working near traffic rights-of-way and whenever on-site personnel determine they are needed.

Personal Decontamination Procedures: Skin that comes in contact with chemicals or soil/water with suspected contaminants shall be washed immediately with soap and water. Hands and face shall be thoroughly washed prior to eating, drinking, smoking, or other hand to mouth contact.

CHEMICAL HAZARDS

The site was formerly investigated for fuel hydrocarbons and chlorinated organics. Analytical results from the previous sampling were used to determine expected concentrations identified in Table 1 below. Potential chemical hazards are petroleum hydrocarbons in soil and groundwater. The permissible exposure limits (PEL) and acute/chronic health effects are listed in the table below for each of the known chemicals present.

Table 1
Potential Chemical Hazards

Chemical Name (CAS#)	PEL	Expected Concentration	Health Hazards
Ethylbenzene, toluene, xylenes	100 ppm Ethylbenzene	Ethylbenzene: Soil: <0.004 ppm Water: <0.002 ppm	Acute: skin, eye, and mucous membrane irritation. Chronic: fatigue, headache, and eye and upper respiratory tract irritation.
Total Petroleum Hydrocarbons	N/A	TPH-g, d: Soil: < 3.2 ppm Water: <0.05 ppm	Acute: skin, eye, and respiratory irritation, headache, dizziness. Chronic: N/A

Notes: ppm = Parts per million
N/A = Not Applicable

PHYSICAL HAZARDS

X	Heat	X	Slip, Trip, Fall		Excavations/Trench
X	Cold		Electrical Hazards	X	Moving Equipment
X	Wet	x*	Underground Hazards		Confined Space
X	Noise		Overhead Hazards		
	Other	x* - will be determined after utility clearance			

PERSONAL PROTECTIVE EQUIPMENT R = Required A = As Needed

R	Hard Hat	R	Safety Eye gear: glasses w/ side protection
R	Safety Boots		Respirator (Type): Full-face _____ Half-face _____
R	Orange Vest		Filter Type: Organic vapor ___ Acid gas ___ HEPA __
R	Hearing Protection	R	Gloves (Type): Neoprene ___ Latex __

Nitrile X__ (no leather or Kevlar work gloves)

	Tyvek Coveralls	R	Other Mobile phone
	5 Minute Escape Respirator		

MONITORING EQUIPMENT

The following environmental monitoring equipment is anticipated for this project to monitor the chemicals of concern at the site.

	Organic Vapor Analyzer (FID)	X	PID with lamp of 10.6 electronic volts
	Oxygen Meter		Detector Tube (specify)
	Combustible Gas Meter		Passive Dosimeter
	H_2S Meter		Air Sampling Pump
	W. B. G. T.		Filter Media

ON-SITE SAFETY MEETING ATTENDEES

All personnel are required to read this health and safety plan (and addenda, if necessary). The following site personnel have reviewed the above plan, are familiar with its provisions, and understand the potential hazards and required personal protection.

Signature	Name (Printed)/Title	Date

PERSONAL AIR MONITORING

Required? ____yes _X___no

Sample # _____ Sample # _____

Name _____ Name _____

Date _____ Date _____

Time On _____ Off _____ Time On _____ Off _____

Laboratory Used _____

Figure 1
HOSPITAL ROUTE

Directions to Alta Bates Hospital
350 Hawthorne Avenue

North on Castro
Jog right at Martin Luther King (across San Pablo)
Right on W. Grand
Left on Telegraph
Right on Hawthorne