BASELINE
ENVIRONMENTAL CONSULTING

21 June 2011

Mr. Jerry Wickham
Senior Hazardous Materials Specialist
Alameda County Health Care Services Agency
Environmental Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577
via email at jerry.wickham@acgov.org

Subject: Sampling and Analysis Plan for 751-785 Seventh Street in Oakland, California – RO0002586.

Dear Mr. Wickham:

Please find enclosed a draft of the Sampling and Analysis Plan ("SAP") for a soil gas survey at 751-785 Seventh Street in Oakland, California (RO0002586). The SAP is being submitted to fulfill the County's requirement for an investigation strategy as requested in a letter to the Brush Street Group, dated 21 April 2011. As discussed with you last week, the U.S. EPA is currently reviewing the SAP, as the work will be performed under a Brownfields grant. After addressing any comments from the U.S. EPA or the County, we will submit a finalized copy of the SAP. If you have any questions or comments, please contact us at your convenience.

Sincerely,

James McCarty, P.E.
Project Engineer

REGISTERED PROFESSIONAL ENGINEER
JAMES G. McCARTY
NO. C 62618
EXP. 6/30/12
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STATE OF CALIFORNIA

5900 Hollis Street, Suite D • Emeryville, CA 9468-2008 • (510) 420-8686 • FAX: (510) 420-1707
Emeryville Petaluma

20 June 2011

Mr. Jerry Wickham
Alameda County Health Care Services Agency
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: Transmittal of draft Sampling and Analysis Plan for 751 - 785 Seventh Street, Oakland, California

Dear Mr. Wickham:

Please find attached the above-referenced Sampling and Analysis Plan for a soil gas survey at 751 - 785 Seventh Street, Oakland, which has been prepared by BASELINE Environmental Consulting. I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge.

Sincerely,

Tom McCoy
Brush Street Group, LLC

12 May 2011

Y0323.04.01684

Gopal Nair, Environmental Specialist
Environmental Services Division
City of Oakland, Public Works Agency
250 Frank H. Ogawa Plaza, Suite 5301
Oakland, CA 94612

Subject: Sampling and Analysis Plan for 751-785 Seventh Street in Oakland, California

Dear Mr. Nair:

Please find enclosed Sampling and Analysis Plan ("SAP") for 751-785 Seventh Street in Oakland, California. The SAP provides the details for a soil gas survey at the subject property. If you have any questions or comments, please contact us at your convenience.

Sincerely,

Yane Nordhav, P.G.
Principal

James McCarty, P.E.
Project Engineer

jgm

cc: Wallace Woo, U.S. Environmental Protection Agency
Eugenia E. McNaughton, Ph.D., U.S. Environmental Protection Agency
Jerry Wickham, P.E., Alameda County Environmental Health Services
Tom McCoy, Brush Street Group
Markus Niebanck, P.G., Amicus

SAMPLING AND ANALYSIS PLAN

MAY 2011

751-785 Seventh Street
Oakland, California

Prepared for:

City of Oakland
Public Works Agency
Environmental Services Division
250 Frank H. Ogawa Plaza, Suite 5301

Prepared by:

BASELINE Environmental Consulting

Y0323-04.01684

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SAMPLING AND ANALYSIS PLAN

MAY 2011

751-785 Seventh Street
Oakland, California

Prepared for:

City of Oakland
Public Works Agency, Environmental Services Division
250 Frank H. Ogawa Plaza, Suite 5301

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APPROVAL PAGE

Approved by: _____ _____
Gopal Nair, Project Manager — Date
City of Oakland

Approved by: _____ _____
James McCarty, P.E., Project Manager — Date
BASELINE

Approved by: _____ _____
Reginald Ramirez, P.E., QA Officer — Date
BASELINE

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DISTRIBUTION LIST

Each person listed on the approval sheet and each person listed under Section 1.3 Project Organization (except for contractors retained by BASELINE) will receive a copy of this Sampling and Analysis Plan ("SAP"). Subsequent revisions to this SAP will be distributed to personnel listed below.

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The Project Manager, whose role is further defined below, is responsible for ensuring that all key personnel have the most recent version of this SAP. Each page will be dated in the footer and any revised pages will be clearly marked with the revision date.

ACRONYMS AND ABBREVIATIONS

ACEH	Alameda County Environmental Health Services
ACPWA	Alameda County Public Works Agency
BASELINE	BASELINE Environmental Consulting
bgs	below ground surface
C.E.G	Certified Engineering Geologist
C.Hg.	Certified Hydrogeologist
City	City of Oakland
Clearwater	Clearwater Environmental Management Inc.
COC	chain of custody
COPC	chemicals of potential concern
Cr-VI	hexavalent chromium
DI WET	Waste Extraction Test using deionized water
DQI	Data Quality Indicator
EDD	Electronic Data Deliverable
ESA	Environmental Site Assessment
ESLs	Regional Water Board Environmental Screening Levels
HSP	Site-specific Health and Safety Plan
IDW	investigation-derived waste
ml	milliliter
MPC	Measurement Performance Criteria
MQO	Measurement Quality Objective
MTBE	Mmethyl tertiary butyl ether
PAHs	Ppolynuclear aromatic hydrocarbons
PARCCS	Precision, Accuracy, Representativeness, Completeness, Comparability, and Sensitivity
PCBs	polychlorinated biphenyls
P.E.	Professional Engineer
P.G.	Professional Geologist
ppm	parts per million
PM	Project Manager
PPE	personal protective equipment
QA	Quality Assurance
QAO	Quality Assurance Officer
QA/QC checklist	Quality Control checklist for review of laboratory report
QC	Quality Control
Regional Water Board	San Francisco Bay Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
TCE	trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
TEG	TEG Northern California
TOC	top of casing
TPH	total petroleum hydrocarbons
USA	Underground Service Alert
EPA	U.S. Environmental Protection Agency

VOC	volatile organic compound
µg/L	micrograms per liter

SAMPLING AND ANALYSIS PLAN
751-785 Seventh Street
Oakland, California

1. INTRODUCTION

This Sampling and Analysis Plan ("SAP") has been prepared for a soil gas survey for the property located at 751-785 Seventh Street in Oakland, California ("the site") (Figure 1). The site was previously used for commercial activities, which has affected the shallow soils and groundwater at the site (BASELINE, 2010). The site is owned by the Brush Street Group and is currently an active site under the regulatory oversight from the Alameda County Environmental Health Services ("ACEH") (Alameda County SLIC Case No. RO0002586). Performing a soil gas survey will provide information to determine whether conditions of environmental concerns are present at the site.

The City of Oakland ("the City") has received funding from the U.S. Environmental Protection Agency's ("EPA") Brownfields Program to perform environmental assessments at properties suspected of containing hazardous substances. The activities described in this SAP will be performed under a Brownfields Assessment Grant issued by the EPA for the City of Oakland.

This SAP presents procedures for collection of soil gas samples from the site and evaluation of analytical data. This SAP has been prepared in accordance with EPA guidelines (EPA, 2009).

1.1 Site Description

The site is a rectangular parcel with a surface area of approximately 22,500 square feet located in Oakland, Alameda County, California (Figure 2). The Alameda County Assessor's Office identified the site as parcel number 1-223-2-1. The site is bordered by Seventh Street to the northeast, Brush Street to the southeast, a light industrial facility to the southwest (601 Brush Street), and a Shell Service Station (610 Market Street) to the northwest. The eastern half of the site is occupied by a 5,000 square foot building, which is leased to the Kinetic Arts Center. The remainder of the site covered with concrete cement pavement and can be accessed through gates on Seventh and Brush streets. The site has an elevation of approximately 26 feet above sea level and is located within a mixed residential, commercial, and light industrial area of Oakland.

1.2 Responsible Agency and Consultant

The City is the agency responsible for managing the Brownfields Assessment grant and environmental assessments performed under the grant. The EPA provides technical review and advice to the City and ensures that assessments performed under the Brownfields Assessment grant meet EPA requirements.

The Brush Street Group has retained BASELINE Environmental Consulting ("BASELINE") to perform an environmental assessment in accordance with the requirements of the EPA Brownfields program managed by the City. BASELINE is a multi-disciplinary environmental consulting firm established in 1985; its professional staff consists of engineers, geologists, and

hydrogeologists. TEG Northern California ("TEG"), a California-licensed driller and a California-certified mobile laboratory, will advance proposed soil gas borings and perform on-site chemical analysis of soil gas samples.

1.3 Project Organization

The responsibility for implementing and ensuring compliance with this SAP lies with the Project Manager ("PM") and individual employees of BASELINE. The analytical laboratory shall be instructed in the SAP requirements by the PM or his representative. The titles, names, contact information, and responsibilities of personnel involved in the implementation of this SAP are summarized in Table 1. The lines of communication between personnel are depicted on Figure 3.

2. BACKGROUND

This section presents information regarding the site, including past and current uses, previous investigations, and potential environmental concerns.

2.1 Site History

A plating facility was operated at the site between 1957 and 1998, at which time the site was abandoned (BASELINE, 2005). The abandoned plating facility contained hazardous materials and wastes, which were removed during an emergency response action directed by EPA, Office of Emergency Response in 1998/1999. Subsequent soil and groundwater investigations have found that the soil and groundwater at the site have been impacted by metals, in particular hexavalent chromium ("Cr-VI"), and volatile organic compounds ("VOCs"), in particular, trichloroethene ("TCE").

The primary source of metals and VOCs appears to have been a below-grade concrete structure referred to as the Frog Pond (Figure 2). Between June and December 2007, the Frog Pond was removed and backfilled with gravel. The Frog Pond was subsequently covered with a concrete cap.

2.2 Previous Investigations

Environmental investigation of the site began in February 2003 and has occurred in several phases as summarized below. This section also presents information regarding a soil gas survey at the adjoining property 601 Brush Street.

2.2.1 Phase I

BASELINE performed a preliminary soil and groundwater investigation in 2003 (BASELINE, 2003). A total of seven soil borings, B-FP01 through B-FP07, were installed to depths ranging from 16 to 25 feet below ground surface ("bgs"), and two shallow monitoring wells, MW-FP1 and MW-FP2, were installed (Figure 2).

Soil samples were collected in the fill and just beneath the fill/native material interface at approximately two feet and five feet bgs. Soil samples were analyzed for Title 22 metals, total petroleum hydrocarbons ("TPH") as gasoline and diesel, VOCs, polynuclear aromatic

hydrocarbons ("PAHs"), polychlorinated biphenyls ("PCBs"), pH, Cr-VI, and cyanide. Select soil samples were also analyzed for soluble lead and/or nickel using the waste extraction test using deionized water ("DI WET") or toxicity characteristic leaching procedure ("TCLP").

Groundwater samples were collected from the two groundwater monitoring wells. Grab groundwater samples were collected from two boreholes, B-FP04 and B-FP05, to assess groundwater quality directly beneath the property. These groundwater samples were analyzed for TPH, VOCs, PAHs, PCBs, and cyanide. A grab groundwater sample was also collected from boring B-FP03 and analyzed for TPH to assess the potential presence of petroleum hydrocarbons, which might have migrated from the adjacent Shell Service Station site.

Elevated levels of lead, nickel, and zinc were reported in shallow soils samples. Several of the soil samples contained soluble nickel at levels that exceeded California hazardous waste criteria. One sample, B-FP07 collected at 2.5 feet bgs was reported to contain elevated levels of PAHs and cyanide. However, the soil sample collected from 5.0 feet bgs at this location did not contain elevated levels of these contaminants. Elevated levels of nickel were also reported in two of the grab groundwater samples and one of the groundwater monitoring well samples. TPH as diesel was reported in the groundwater sample from MW-FP1 and TPH as gasoline was reported in the grab groundwater sample B-FP03.

2.2.2 Phase II

BASELINE performed a Phase II investigation in November 2005 (BASELINE, 2006). The investigation consisted of installation of soil borings in: 1) source areas (borings B-FP08 through B-FP17), 2) areas to define the extent of the PAH-impacted area (borings B-FP07A through B-FP07C), and 3) areas with exposed soil (samples SS-FP01 through SS-FP10). In addition, grab groundwater samples were collected from select soil borings and the two on site groundwater monitoring wells (Figure 2).

Soil samples were analyzed for one or all of the following: Title 22 metals, VOCs, PAHs, and Cr-VI. Select soil samples were also analyzed for soluble cadmium, copper, lead, and/or nickel using DI WET or TCLP. Groundwater samples from the two groundwater monitoring wells were analyzed for TPH as gasoline, TPH as diesel, VOCs, and PAHs. Grab groundwater samples from the soil borings were analyzed for at least one of the following: Title 22 metals, Cr-VI, TPH as gasoline, TPH as diesel, VOCs, PAHs, and pH.

Elevated levels of total chromium, Cr-VI, copper, lead, nickel, and zinc were reported in shallow soil samples. Elevated levels of cis-1,2-dichloroethene ("1,2-DCE") and TCE were reported in one grab groundwater sample (B-FP14).

2.2.3 Phase III Investigation

The Focused Phase III investigation was proposed after sample results from the Phase II investigation identified chlorinated VOCs adjacent to the Frog Pond, located in the southwestern portion of the site (Figure 2) (BASELINE, 2006). The focused Phase III investigation was proposed to clarify the presence of chlorinated VOCs in the area. The investigation consisted of collecting soil and grab groundwater samples from six soil borings (B-FP18 through B-FP23) (Figure 2).

Two soil samples were collected from each boring, from five or six feet bgs and from 12 feet bgs. Soil samples were analyzed for VOCs. In addition, the soil sample from B-FP25 collected at 6.0 feet bgs was also analyzed for Cr-VI. About six inches of standing water was observed at an elevation higher than the presumed bottom of the Frog Pond in boring B-FP23. This water had a greenish-yellow tint. The grab groundwater sample collected from B-FP23 also had a greenish-yellow tint, more strongly colored than the water in the Frog Pond. The grab groundwater sample from B-FP23 was analyzed for Title 22 metals, Cr-VI, VOCs, and pH.

Elevated levels of chromium and Cr-VI were reported in the soil sample collected from B-FP23, adjacent to and south of the Frog Pond (Figure 2). Elevated levels of 1,2-DCE and TCE were reported in several grab groundwater samples. Elevated levels of antimony, total chromium, Cr-VI, cobalt, copper, lead, mercury, nickel, silver, thallium, and/or vanadium were also reported in the grab groundwater samples from B-FP23 and FP-GRAB GW.

2.2.4 Frog Pond Removal

Data from the Phase III investigation suggested that the Frog Pond was the likely source of contamination. Therefore, the Frog Pond was removed in an attempt to identify the source (BASELINE, 2008). BASELINE collected soil samples from eight locations underneath the Frog Pond between 31 May and 5 June 2007 (sample locations B-FP24 through B-FP31 on Figure 2) and submitted the samples for Title 22 metals and Cr-VI analyses (BASELINE, 2008). Sample locations B-FP24 through B-FP28 were chosen to characterize the soil underneath the Frog Pond. Samples were collected from sampling locations B-FP24 through B-FP28 from 4.5 feet below the surrounding grade, which was immediately below the concrete bottom of the Frog Pond. A second soil sample was collected at 9.5 feet below grade, or five feet below the bottom of the Frog Pond from B-FP24 through B-FP27.

Additional soil samples were collected below suspect features found in the Frog Pond, as follows:

- One soil sample (B-FP29) was collected from seven feet bgs, which is below the bottom of the Eastern Sump;
- One soil sample (B-FP30) was collected below the bottom of the sump that was attached to the separate concrete pad found about one foot below the bottom of the Frog Pond from seven feet below grade; and
- Two soil samples were collected adjacent to the concrete column (B-FP31) from 11.5 and 18.5 feet below grade.

BASELINE also collected a sample of the fine-grained sand immediately below the cobbles imbedded at the bottom of the concrete column for metals analysis, after the cobbles and sand were excavated. Elevated levels of total chromium, Cr-VI, copper, and nickel were reported in some of the soil samples collected.

2.2.5 Soil Gas Survey – 601 Brush Street

On 24 September 2009, P&D Environmental performed a subsurface investigation for the property adjacent to and southwest of the site, 601 Brush Street. Part of the scope of work included installation of two borings (B6 and B7) and two soil gas probes (SG5 and SG6) on the

southwestern portion of the 751-785 Seventh Street property (P&D Environmental, 2009). Grab groundwater samples were collected from the borings, which were reported to contain methyl tertiary butyl ether ("MTBE") at 0.64 and 8.6 micrograms per liter ("µg/L"), 1,1-dichloroethene at 1.2 and 2.7 µg/L, and TCE at 7.1 and 15 µg/L. Grab groundwater samples collected on the 601 Brush Street property contained 1,1-dichloroethene and TCE at higher concentrations.

The soil gas samples collected on the 751-785 Seventh Street property contained TCE at 3,400 and 5,900 micrograms per cubic meter. Low concentrations of benzene, toluene, ethylbenzene, and xylenes were also reported in one of the samples. The soil gas concentrations reported in the samples collected at the 751-785 Seventh Street property were higher than those collected at 601 Brush Street. However, of the nine soil gas samples collected at 601 Brush Street, five contained the tracer compound 2-propanol used for leak detection in the sampling train, indicating that the five samples collected from the 601 Brush Street property were biased low and may not be reliable.

2.2.6 Phase IV Investigation

In March and April 2010, BASELINE conducted an additional soil and groundwater investigation at the site (BASELINE, 2010). BASELINE installed three shallow groundwater monitoring wells (MW-FP3, MW-FP4A, and MW-FP5) and one deep groundwater monitoring well on the subject property (MW-FP4B) , and one shallow (MW-FP6) and one deep groundwater monitoring well (MW-FP7B) off-site in the downgradient direction. BASELINE collected soil samples during the installation of the wells, which were analyzed for Title 22 metals and hexavalent chromium. Once the wells were installed, BASELINE collected groundwater samples from the new wells, two existing wells on-site, and two off-site wells that are part of a groundwater monitoring network for the adjacent Shell Service Station (MW-3 and MW-9). The groundwater samples were analyzed for VOCs, Title 22 metals, and Cr-VI.

The soil and groundwater investigation found that the shallow aquifer is confined by a layer of clay (Old Bay Mud) that is present at the site at approximately 57 feet bgs. Soil samples collected on-site contained total chromium and Cr-VI at concentrations exceeding environmental screening levels for residential or commercial land use where groundwater is not a potential drinking water source. In addition, the groundwater samples collected both on-site and off-site contained dissolved total chromium, Cr-VI, cobalt, copper, and nickel at concentrations exceeding environmental screening levels for sites where groundwater is not a potential drinking water source. The groundwater samples collected on-site also contained thallium and vanadium at concentrations exceeding environmental screening levels for sites where groundwater is not a potential drinking water source.

None of the groundwater samples collected contained VOCs at concentrations exceeding the environmental screening levels for sites where groundwater is not a potential drinking water source and VOC concentrations in off-site wells are all below environmental screening levels where groundwater is not a potential drinking water source. Nickel, copper, and cobalt are present in off-site wells at concentrations above environmental screening levels where groundwater is not a potential drinking water source.

2.3 Scoping Meeting

A scoping meeting for the soil gas survey proposed for the site has not been conducted. No scoping meeting is scheduled for the soil gas survey.

2.4 Hydrogeology

The site is located within the East Bay Plain Subbasin (DWR, 2004). The East Bay Plain Subbasin is a northwest trending alluvial plain bounded on the north by San Pablo Bay, on the east by the contact with Franciscan Basement rock, and on the south by the Niles Cone Groundwater Basin. The East Bay Plain Basin extends beneath San Francisco Bay to the west. Average precipitation in the subbasin ranges from about 17 inches in the southeast to greater than 25 inches along the eastern boundary; most of the precipitation occurs between the months of November and March.

Past investigations indicate that the lithology is consistent across the site. The soil from the surface to 3 or 4 feet bgs consists of silty sand/sand fill with some brick and concrete debris. Very fine- to fine-grained sands (Merritt Sands) of the San Antonio Formation underlie the fill and are expected to extend to approximately 60 feet bgs. Regional groundwater flow direction in the San Antonio Formation is southwesterly toward the Oakland Inner Harbor. The hydraulic conductivity has been estimated to be 0.005 centimeter per second (Subsurface Consultants and Todd Engineers, 1997). The Merritt Sands is underlain by plastic clay (Old Bay Mud). The Old Bay Mud is the confining layer for the deeper water-bearing formation.

The depth to groundwater at the site, as measured in 2003 and 2005, ranged from 12.3 to 15.5 feet below the TOC. The depths to groundwater measured on 15 April 2010 were used to calculate the groundwater elevation at the wells referenced to the North American Vertical Datum 1988. Groundwater contours based on these elevations are presented on Figure 4. The groundwater flow direction on 15 April 2010 was toward the southwest with gradient of 0.005 (Figure 4).

2.5 Impact on Human Health and/or the Environment

The results of past investigations provide evidence that past use of the site as a plating facility has resulted in metals impact to the soil and groundwater at the site. The analytical results of the soil and groundwater samples collected during previous investigations indicated that the elevated concentrations of metals in the soil and groundwater, primarily Cr-VI, originated from the area of a subsurface concrete column associated with the former Frog Pond. The groundwater impact is confined to the Merritt Sand since the Old Bay Mud, present at approximately 60 feet bgs, acts as a barrier to further vertical migration.

While dissolved cobalt, copper, nickel, thallium, and vanadium were also reported in groundwater samples collected on-site at concentrations exceeding environmental screening levels, the impact is limited since detection of these metals has only been reported in a few soil samples collected on-site. VOCs have been detected in shallow soil samples and grab groundwater samples collected at the site; however, no VOCs were reported at concentrations exceeding the environmental screening levels in the groundwater samples collected from groundwater monitoring wells.

Dissolved hexavalent chromium in the groundwater has migrated as far as 120 feet from the Frog Pond in the southwesterly direction. The results also indicate that the Cr-VI has migrated off-site and the plume appears to be undergoing vertical dispersion as indicated by the increase in the Cr-VI concentration in the deeper off-site well, screened in the Merritt Sands, relative to the deeper on-site well, also screened in the Merritt Sands.

Grab groundwater samples from borings B-FP14, B-FP18, B-FP20, B-FP22 contained elevated concentrations of TCE and 1,2-DCE. Although the reported concentration are below the ESLs for potential vapor intrusion concerns from groundwater (Regional Water Board, 2008), and only trace concentrations were reported in the shallow soils, the soil gas survey conducted for the adjacent property (601 Brush Street, see Section 2.2.5) indicated that TCE vapors were present in soil gas on-site at levels exceeding ESL screening values for potential vapor intrusion.

3. DATA QUALITY OBJECTIVES

3.1 Problem Definition

Based on the findings of past investigations, further assessment of the site is needed to determine whether VOCs are present in the subsurface at the site at levels that could pose a risk to present and future users of the site. Details regarding future redevelopment plans of the site were not available at the time this SAP was prepared. Specifically, the soil gas survey will provide information to address the following question:

Does soil gas underneath the site contain VOCs at concentrations that indicate a potential vapor intrusion concern in existing or future buildings on the site?

The objective of the soil gas survey is to determine whether VOCs are present in the soil gas underneath the site at level that represent a human health hazard. Based on the past investigations at the site, the chemicals of potential concern ("COPCs") for vapor intrusion are TCE and 1,2-DCE.

3.2 Task Description

To obtain the information needed, soil gas samples will be collected within the site boundaries and analyzed for COPCs. The results will be compared against the Regional Water Board's Environmental Screening Levels ("ESLs") (Regional Water Board, 2008). The ESLs are considered conservative risk-based concentrations of chemicals commonly found at contaminated sites; it is used to screen sites with potential environmental concerns related to soil, soil gas, or groundwater using various exposure scenarios and land uses. The presence of an analyte at concentrations at or below the corresponding ESL would not be expected to pose a significant threat to human health or the environment.

If the analytical results indicate that contaminants are present at levels that may pose a risk to human health, BASELINE will recommend further investigation or evaluation of the data, as necessary.

3.3 Data Quality Objective

The purpose of the soil gas survey is to assess potential subsurface impacts at the site due to previous use of the site as a plating facility. The soil gas survey will provide information on the potential presence of contaminants in soil gas underneath the site. Depending on the level of impact, the presence of contaminants in the subsurface could require remediation if a significant health risk to existing or future users of the site is determined. The Data Quality Objective for this SAP is to determine if COPCs are present in the subsurface of the site at concentrations that could pose a threat to human health.

The laboratory reporting limits (mobile laboratory) and action levels for compounds that will be analyzed for soil gas samples are summarized in Table 2. The action levels for soil gas samples are based on the ESLs for evaluation of potential vapor intrusion concerns.

If none of the analytical results exceeds the ESLs, the conditions at site will be considered protective of human health. If any of the analytical results exceed the ESLs, BASELINE may perform further evaluation of the data or recommend further investigation.

The laboratory reporting limits for soil gas have been compared against respective action levels. The laboratory reporting limits of target compounds for soil gas samples are all below the respective action levels.

3.4 Measurement Quality Objectives

Measurement Quality Objectives ("MQOs") have been established for this SAP to assess the viability and usability of data. The MQOs are based on field and laboratory protocols that examine whether the data quality indicators ("DQIs") (i.e., precision, accuracy, representativeness, completeness, comparability, and sensitivity ["PARCCS"]) meet the criteria established for various aspects of data gathering, sampling, or analysis activity. These terms are briefly described below.

- Precision is a measure of the reproducibility of data when multiple samples are collected and analyzed under the same set of conditions.
- Accuracy is the difference between a measured value and an accepted reference or true value. The difference is usually expressed as a percentage.
- Representativeness is the degree to which data accurately and precisely represent an environmental condition.
- Completeness is a measure of the amount of valid data collected from a location compared to the amount that will be expected to be obtained under normal conditions.
- Comparability is a measure of the confidence with which one data set can be compared to another.

The only field measurement that will be taken as part of this investigation will be depth to groundwater measurements.

Depth to groundwater measurements will be recorded using an electronic water level meter with a tape graduated to 1/100 of a foot. The measurements will be recorded to 1/100 of a foot and then measured again to ensure that the measurement is precise. If the difference between the two measurements is more than 1/100 of a foot, then the measurement will be retaken until two successive measurements are in agreement.

Field DQIs will include an air purge step test and a duplicate sample. These samples will provide data regarding the precision, accuracy, and representativeness of samples collected. The measurement performance criteria ("MPC") for the duplicate samples will be a relative percent difference of 50 percent or less.

The sampling completeness value will be calculated after all data have been validated. Data are considered valid when samples are collected and analyzed in accordance with established quality control ("QC") procedures and when none of the QC criteria affecting data usability is exceeded. The sampling completeness value will be calculated by dividing the number of usable data by the total number of data planned to be collected for this investigation. The result will be expressed in terms of percentage. The MPC for completeness will be 90 percent.

The comparability of data can be affected by variations in sampling techniques, analytical methods, and environmental conditions (e.g., weather/seasonal variation). Data comparability for this investigation will be ensured by using the same sampling techniques, analytical method, and analytical laboratory for all samples collected from the site throughout this investigation. Weather/seasonal variation is not expected to affect data comparability since collection of all samples is expected to be completed in one day.

The mobile laboratory will calibrate equipment and analyze samples in accordance with EPA Method 8260B for VOCs. Procedures for analyses of soil gas samples will include blank, surrogate, and laboratory control samples. The DQIs for VOC analyses are presented in the laboratory's Standard Operating Procedures included in Appendix A.

3.5 Data Review and Validation

The original laboratory reports will be kept in BASELINE's permanent file. All data will include the date, initials of the sampler, and relevant analytical information. The acceptability of the data is determined by the PARCCS criteria stated above (see Section 3.4 Measurement Quality Objectives). The results of the evaluation will be documented by the PM as part of the QC Checklist for Review of Laboratory Report ("QA/QC checklist") and placed in the permanent file with the original laboratory reports. A copy of the QA/QC checklist is provided in Appendix B. If the evaluation indicates non-compliance with an established procedure or requirement, a recommendation for corrective action will be documented on the QA/QC checklist.

Sample data will be accepted without qualification for all data reviewed by BASEINE with favorable responses on the QA/QC checklist. The definition of favorable is the answer selected that does not indicate a problem with the data and/or that the data are not flagged with any qualifier described below. For all questions on the QA/QC checklist, the favorable answer is "YES."

BASELINE will review the analytical data, and assign data qualifiers, if required, in accordance with EPA guidelines (EPA, 2002; EPA, 2008). BASELINE may assign data validation qualifiers to particular sample results based on information such as the laboratory case narrative, laboratory qualifiers, and laboratory QC data. The specific criteria for accepting sample data and a description of the data qualifiers that could be assigned to the data are as follows:

- For all analytical data reviewed by BASELINE that meet acceptance criteria on the QA/QC checklist, the data will be accepted without qualification. For data meeting the QA/QC acceptance criteria, the answer to all questions on the QA/QC checklist, is "YES." These data will not require an assigned qualifier as described below.
- BASELINE may assign a "J" qualifier to indicate that an analyte was positively identified and the associated concentration is approximate. The detected concentration is approximate if certain laboratory QC criteria were not met. For example, a J qualifier could be assigned because surrogate recoveries were above the laboratory control limits (indicating a high bias), or the method holding time was exceeded (but not grossly exceeded). A J-qualified result should be considered an estimated concentration, but may be used without modification for making decisions about the site; as such, re-sampling or re-analysis is not required.
- BASELINE may assign a "UJ" qualifier to indicate that an analyte was not detected at a level greater than or equal to the method detection limit, and that the associated non-detect result is approximate because certain QC criteria were not met. The UJ-flagged data, although considered approximate, may be used without modification for making decisions about the site; as such, re-sampling or re-analysis is not required.
- BASELINE may assign a "U" qualifier to indicate that an analyte was analyzed for, but was not detected at a level greater than or equal to the method detection limit for the sample and analytical method. The U qualifier will be assigned when sample contamination is suspected based on detections of target analytes in an associated blank sample. For suspected contaminated data, the method detection limit will be raised to the concentration detected in the sample, and the result will be assigned a U qualifier, and treated as a non-detect result. The primary issue for U-qualified data is how non-detect results will be treated for statistical analyses (e.g., for non-detects use the method detection limit, one-half the method detection limit, or a statistical distribution of the method detection limits). Statistical analyses are not proposed for the evaluation of the analytical data collected for this investigation. Consequently, the use of U-qualified data will have no effect on site decisions, except that a U-qualified result should be treated as a non-detect result with an elevated reporting limit. Re-sampling or re-analysis is not required.
- BASELINE may assign an "R" qualifier to indicate that the data are unusable due to the quality of the data generated because certain QC criteria were not met. The analyte may or may not be present in the sample. An R qualifier could be assigned if QC criteria or method holding times are grossly exceeded. Data that are R-flagged are rejected and cannot be used to make decisions about the site. Re-sampling and/or re-analysis may be performed and the new data will be subject to review per BASELINE's QA/QC checklist and EPA guidelines.

3.6 Data Management

This section describes, in general, how site data will be recorded, tracked, stored, and analyzed. The two primary types of data are field data and laboratory data. Data management for each are described below.

3.6.1 Field Data Management

In general, field data will include field measurements, field notes, and sample transmittal documents.

Field data will be recorded on the following forms:

- Daily Field Log; and
- Chain-of-Custody Form ("COC").

Examples of these forms are shown in Appendix C. All paper copies of these forms and reports will be maintained in the permanent files in BASELINE's Emeryville office.

3.6.2 Laboratory Data Management

Electronic data are generally derived from automated data acquisition systems. Analytical instruments are equipped with software that performs various manipulations, identifications, and calculations of data. Software calculations are verified manually during the data validation process. Other data generated by the analytical laboratory consist of manually recorded results, such as sample weight. This data is documented in a laboratory daily worksheet and subsequently entered into electronic files. The electronic data undergoes a QC check against the daily worksheets to ensure accuracy prior to submission of the report. Any errors encountered will trigger further auditing until no transcription errors are encountered in the audit set.

Raw analytical data that require further reduction to produce usable results are reduced according to procedures defined in the referenced analytical method or laboratory standard operating procedure for the activity. After the data have been generated, they are subjected to a three-tiered review process similar to the one described below. This review process includes verifying the electronic identifications and calculations performed by the software and a technician.

The analytical laboratory will perform a three-level review consisting of the following steps. The first level of review is performed by a responsible technician. The technician verifies that QC acceptance criteria have been met and that instrument operating conditions were appropriate for the analysis performed. The second level is a peer review of the technician's observations, calculations, and QC criteria. A preliminary report is assembled, assuming any anomalies identified by the peer have been reconciled. A senior staff member performs the final, or third level, review, which consists of the same checks on the final report as those performed during the second level of review. The QA Manager or their designee will also perform reviews of work products as part of their audits.

- Laboratory data will be reported in a preliminary electronic report (this report does not include a signature from a laboratory representative, a case narrative, and a copy of the COC) and a final electronic report (signed by the laboratory representative). The preliminary and

final laboratory reports are provided in portable document format. The preliminary data are generally reported in summary form including sample identification information, results for the sample analyses, and a summary of the QC data including calibrations and verifications of precision, and accuracy, where appropriate.

3.7 Assessment Oversight

When the laboratory data is completely transferred to BASELINE, BASELINE will assume responsibility for managing the data. All chemical data generated during implementation of this SAP will be stored in a Microsoft Excel file. The data will be maintained and updated by the PM or designee. BASELINE's Quality Assurance Officer ("QAO") will be responsible for verifying data from the mobile laboratory are accurate and consistent. Data entered into a spreadsheet for production of a report will originate from the final laboratory report. BASELINE's QAO will check the report's summary tables against the final laboratory report. Field data such as sample depths will be entered into the report tables by the PM or designee using standardized worksheets. BASELINE's QAO will check the report's summary tables and any figures produced against the daily field and/or boring logs. Corrections will be made with a red pen and a copy retained in the permanent file. Prior to finalization of the report, BASELINE's QAO will verify all corrections have been made.

4. SAMPLING DESIGN

This section presents the rationale for collection and analysis of soil gas samples at the site. The rationale for each sample and the respective analytical parameters are summarized in Table 3.

4.1 Soil Gas Survey

BASELINE will collect soil gas samples from six locations within the site (SG-01 through SG-06 on Figure 5). Proposed soil gas boring locations may be relocated based on field conditions. The soil gas samples will be used to determine whether chlorinated hydrocarbon vapors are present in the vadose zone at levels that represent a health risk to existing and future users at the site. The soil gas samples will be collected at 5 and 10 feet bgs.

5. REQUEST FOR ANALYSIS

This section provides information on the analytical method to be used to measure COPCs for each sample and the laboratory that will perform requested analyses.

5.1 Analysis Narrative

Implementation of this SAP will involve analysis of soil gas samples collected from the site. Soil gas samples will be analyzed using a mobile laboratory operated by TEG. The laboratory is California state-certified to perform the analysis proposed. BASELINE will ensure that the laboratory has current certification by the California Department of Health Services Environmental Laboratory Accreditation Program for EPA Method 8260B.

The soil gas samples will be analyzed for VOCs in accordance with EPA Method 8260B and will have an expected detection limit of 0.1 microgram per liter ("ug/L"). One duplicate sample will

be collected from SG-04 at 5.0 feet bgs and analyzed for QA/QC. This is near the locations where elevated TCE was reported in grab groundwater samples.

The number of samples and analytical methods for the soil gas samples is summarized on Table 4. The container, preservation requirement, and holding time for soil gas samples are presented on Table 5.

6. FIELD METHODS AND PROCEDURES

This section presents procedures for collecting soil gas samples at the site.

6.1 Field Equipment and Supplies

Field equipment and supplies required during field activities include:

- Drill rig (Direct Push Technology);
- Mobile laboratory (for analysis of soil gas samples);
- Personal protective equipment ("PPE") (hard hat, high-visibility vest, and nitrile gloves;
- Tape measure;
- Water level meter;
- Syringe (to be provided by TEG); and
- Soil vapor probe (to be provided by TEG).

All equipment and instruments that will be used during field activities will be maintained and calibrated to operate within manufacturers' specifications so that the required sensitivity and QA/QC parameters are upheld. A copy of the operating manuals for the field instruments will be kept with those instruments. William Scott is BASELINE's Field Equipment Maintenance Supervisor and is responsible for instructing field personnel in proper maintenance and calibration procedures for field equipment. Field personnel are responsible for maintaining field equipment in proper operating condition.

Routine daily field maintenance of field equipment will include:

- Removal of surface dirt and debris from exposed surfaces of the sampling equipment and measurement systems;
- Storage of equipment away from the elements;
- Daily inspections of sampling equipment and measurement systems for possible problems (e.g., cracked or clogged lines or tubing or weak batteries); and
- Charging any battery packs for equipment when not in use.

6.1.1 Calibration of Field Equipment

No field equipment will be used that will require calibration.

6.2 Permitting and Utility Clearance

Prior to field activities, BASELINE will obtain a drilling permit from the Alameda County Public Works Agency ("ACPWA") and contact Underground Service Alert ("USA") to clear proposed soil gas boring locations. Proposed soil gas boring locations will be relocated, as appropriate, if a conflict with underground utilities is identified by USA. Access to the site will be coordinated with the Brush Street Group by BASELINE.

6.3 Field Screening

No field screening will be performed.

6.4 Soil Gas Survey

Twelve soil gas samples will be collected from six locations as shown on Figure 5. Proposed soil gas boring locations may be relocated based on field conditions. BASELINE will contract with TEG Northern California, Inc. ("TEG"), a licensed drilling company that specializes in soil gas sample collection, to advance shallow soil borings using a direct push technique and install temporary soil gas probes Soil gas samples will be collected at 5 and 10 feet bgs at each location. The temporary probes will be driven to the target sample depth and the outer rod pulled back to expose the inlet to the soil gas probe. Hydrated bentonite will be used to seal around the drive rod at the surface to prevent ambient air intrusion from occurring. The soil gas samples will not be collected for at least 20 minutes following installation of the soil gas probes.

The soil gas will be collected using calibrated glass syringes and analyzed on-site using a mobile California-certified analytical laboratory operated by TEG. Sample flow rate will be controlled by withdrawing the plunger on the syringe at a constant rate, which will not exceed 200 milliliters per minute. Prior to collection of the first soil gas sample, a purge test will be conducted at sample location SG-04. Three soil gas samples will be collected: one sample after purging one purge volume, one sample after purging three purge volumes, and one sample after purging seven purge volumes. The purge volume that yields the highest concentration of TCE will be used as the purge volume to be removed from the remaining locations prior to sampling.

During sampling, isopropanol will be sprayed on the aboveground fittings for leak detection. Isopropanol is not expected to be present in the subsurface and will be included in the analytical list as a tracer indicator of leaks.

All soil gas samples will be analyzed on-site for volatile organics using a mobile laboratory operated by TEG. Analysis of soil gas samples will be performed immediately following collection. A duplicate sample will also be collected from boring location SG-04 at 5.0 feet bgs.

6.4.1 Water Level Measurements

In addition to collecting soil gas samples, BASELINE will measure the depth to groundwater from the ground surface in groundwater monitoring wells MW-FP1, MW-FP2, and MW-FP4A (Figure 2). An electronic water level meter calibrated to 1/100 of a foot will be used to measure depth to groundwater in a temporary well. The depth to groundwater will be measured twice to confirm the accuracy and precision of the measurement. If the difference between the two measurements is more than 1/100 of a foot, then the measurement will be retaken until two

successive readings are in agreement. The water level meter will be decontaminated before and after use by washing in Alconox and water solution followed by rinsing with deionized water.

6.5 Decontamination Procedures

Decontamination of soil vapor sampling equipment will be performed by washing them prior toeach sample collection in the following sequence: 1) a solution of Alconox mixed with clean water (a brush will be used as necessary to remove any debris adhering to the sampling equipment); 2) clean water; and 3) final rinse in de-ionized (DI) water. Anytime the water becomes visibly dirty, it will be replaced.

6.6 Sample Labeling

All samples collected will be labeled in a clear and precise way for proper identification in the field and for tracking in the laboratory. The samples will have pre-assigned, identifiable, and unique numbers. The sample labels will contain the following information:

- BASELINE's name and phone number;
- Project name;
- Unique sample identification;
- Time and date of sample collection;
- Analyses requested; and
- Sampler's initials.

An example of the sample label is provided in Appendix C.

6.7 Chain of Custody Forms and Custody Seals

A copy of the chain of custody form to be used in provided in Appendix C. Since a mobile laboratory will be used on-site, custody seals will not be used.

7. SAMPLE CONTAINERS, PRESERVATION REQUIREMENTS, AND PACKAGING AND SHIPPING

This section presents information regarding sample containers, preservation requirements, and packaging and shipping procedures for each sample matrix.

7.1 Sample Containers and Preservation Requirements

7.1.1 Soil Gas Sample

Soil gas samples will be collected in a syringe supplied by TEG. A new syringe will be used for each sample location and for collection of a duplicate sample. No preservative is required for all soil gas samples. All soil gas samples will be analyzed on-site using a mobile laboratory operated by TEG.

7.2 Packaging and Shipping

Since a mobile laboratory will be used on-site, samples will not be packed or shipped.

8. DISPOSAL OF RESIDUAL MATERIALS

In the process of collecting environmental samples, the sampling activity will generate different types of potentially contaminated investigation-derived wastes ("IDW") that will include the following:

- Used PPE (e.g., nitrile gloves); and
- Disposable sampling equipment (e.g., tubing).

Used PPE and disposable sampling equipment will be bagged and placed in a municipal refuse dumpster. These wastes are not considered hazardous and can be sent to a municipal landfill. Any PPE and disposable equipment that is to be disposed of, but can still be reused, will be rendered inoperable before disposal in a refuse dumpster.

The decontamination rinsate water derived from the sampling will disposed of into the sanitary sewer system.

9. DOCUMENTATION OF FIELD ACTIVITIES

This section describes the procedures for documenting field activities.

9.1 Field Logs

Field personnel are responsible for recording the activities performed and pertinent observations in a Daily Field Log (Appendix C). After field sampling activities, field documents will be checked by field personnel and then peer reviewed to confirm that correct sampling procedures were adhered to and that field data are coherent. The Daily Field Log will document any deviations from this SAP. The PM will ensure that all such deviations are documented. The original records from field activities will be kept in BASELINE's permanent file. At a minimum, the following information will be recorded in the Daily Field Log:

- Field observations and details related to analysis or integrity of samples (e.g., weather conditions, noticeable odors, etc.);
- Time of arrival and departure from the site;
- Other site personnel and visitors (e.g., inspectors);
- Deviations from sampling plans, site safety plans, and SAP procedures;
- Changes in personnel and responsibilities with reasons for the changes; and
- Levels of safety protection.

9.2 Photographs

Photographs will be taken of field activities or other areas of interest at the site. The photographs will serve to verify information entered in the Daily Field Log. For each photograph taken, the following information will be written in a logbook or recorded in a separate field photography log:

- Time, date, location, and weather conditions;
- Description of the subject photographed; and
- Name of person taking the photograph.

10. QUALITY CONTROL

This section discusses the QC samples that will be collected to support the sampling activity. The QC samples will consist of a field duplicate.

10.1 Field Quality Control Samples

Field QC samples are intended to help evaluate conditions during field activities and are intended to accomplish two primary goals, assessment of field contamination and assessment of sampling variability. The former looks for substances introduced in the field due to environmental or sampling equipment and is assessed using blanks of different types. The latter includes variability due to sampling technique and instrument performance as well as variability possibly caused by the heterogeneity of the matrix being sampled and is assessed using replicate sample collection. The following subsections cover field QC.

10.1.1 Assessment of Field Contamination (Blanks)

Field contamination is usually assessed through the collection of different types of blanks. Equipment blanks are obtained by passing distilled or deionized water, as appropriate, over or through the decontaminated equipment used for sampling. Because the soil gas samples will be analyzed in a mobile laboratory on-site, and an ambient air sample could contain target compound, a field equipment blank will not be collected.

10.2 Assessment of Field Variability (Field Duplicate)

To assess field variability, a duplicate soil gas sample will be collected at SG-04 at 5.0 feet bgs after the standard soil gas sample and under identical conditions. The duplicate sample will be subjected to the same analyze as the standard sample. The objective of collecting field duplicates is to assess analytical result variability, which may be due to laboratory error or dynamics of the soil gas in the subsurface.

10.3 Laboratory Quality Control Samples

TEG's analytical procedures include blank and a leak check compound. TEG's QC policies, practices, and procedures are included in Appendix A.

11. FIELD VARIANCES

As conditions in the field may vary, it may become necessary to implement minor modifications to the sampling procedures presented in this SAP. When appropriate, the QAO will be notified and a verbal approval will be obtained before implementing changes. Modifications to the approved plan will be documented in the sampling report.

12. HEALTH AND SAFETY PROCEDURES

Field activities as described in this SAP will be performed in accordance with the HSP. A copy of the HSP is included in Appendix D. In accordance with the HSP, all field personnel engaged in sampling activities will be trained in accordance with 29 Code of Federal Regulations Part 1910.120 Hazardous Waste Operations and Emergency Response and 8 California Code of Regulations Section 5192.

13. REFERENCES

BASELINE, 2010, Phase IV Soil and Groundwater Investigation, 751-785 Seventh Street, Oakland, California, 28 May.

BASELINE, 2008, Documentation of Frog Pond Removal Activities, 751-785 Seventh Street, Oakland, California, 29 February.

BASELINE, 2006, Report on Phase II and Focused Phase III Investigation and Frog Pond Removal Workplan, 751-785 Seventh Street, Oakland, California, June.

BASELINE, 2005, Site History and Data Summary Report, 751-785 Seventh Street, Oakland, California, 10 January.

BASELINE, 2003, Soil and Groundwater Investigation, 751-785 Seventh Street, Oakland, California, 29 April.

California Department of Water Resources ("DWR"), 2004, California's Groundwater Santa Clara Valley Groundwater Basin Bulletin 118, 27 February.

P&D Environmental, 2009, Subsurface Investigation Report, (SG1 through SG6 and B6 through B8), 601 Brush Street, 12 November.

San Francisco Regional Water Quality Control Board ("Regional Water Board"), 2007, Screening for Environmental Concerns at sites with Contaminated Soil and Groundwater - Interim Final, November 2007 (Revised May 2008).

Subsurface Consultants and Todd Engineers, 1997, Draft Hydrogeologic Investigation, 50-Foot Navigation Improvement Project, Port of Oakland, December.

U.S. Environmental Protection Agency ("EPA"), 2009, Sampling and Analysis Plan, Guidance and Template, Version 3, Brownfields Assessment Projects, R9QA/008.1, September.

Two soil samples were collected from each boring, from five or six feet bgs and from 12 feet bgs. Soil samples were analyzed for VOCs. In addition, the soil sample from B-FP25 collected at 6.0 feet bgs was also analyzed for Cr-VI. About six inches of standing water was observed at an elevation higher than the presumed bottom of the Frog Pond in boring B-FP23. This water had a greenish-yellow tint. The grab groundwater sample collected from B-FP23 also had a greenish-yellow tint, more strongly colored than the water in the Frog Pond. The grab groundwater sample from B-FP23 was analyzed for Title 22 metals, Cr-VI, VOCs, and pH.

Elevated levels of chromium and Cr-VI were reported in the soil sample collected from B-FP23, adjacent to and south of the Frog Pond (Figure 2). Elevated levels of 1,2-DCE and TCE were reported in several grab groundwater samples. Elevated levels of antimony, total chromium, Cr-VI, cobalt, copper, lead, mercury, nickel, silver, thallium, and/or vanadium were also reported in the grab groundwater samples from B-FP23 and FP-GRAB GW.

2.2.4 Frog Pond Removal

Data from the Phase III investigation suggested that the Frog Pond was the likely source of contamination. Therefore, the Frog Pond was removed in an attempt to identify the source (BASELINE, 2008). BASELINE collected soil samples from eight locations underneath the Frog Pond between 31 May and 5 June 2007 (sample locations B-FP24 through B-FP31 on Figure 2) and submitted the samples for Title 22 metals and Cr-VI analyses (BASELINE, 2008). Sample locations B-FP24 through B-FP28 were chosen to characterize the soil underneath the Frog Pond. Samples were collected from sampling locations B-FP24 through B-FP28 from 4.5 feet below the surrounding grade, which was immediately below the concrete bottom of the Frog Pond. A second soil sample was collected at 9.5 feet below grade, or five feet below the bottom of the Frog Pond from B-FP24 through B-FP27.

Additional soil samples were collected below suspect features found in the Frog Pond, as follows:

- One soil sample (B-FP29) was collected from seven feet bgs, which is below the bottom of the Eastern Sump;
- One soil sample (B-FP30) was collected below the bottom of the sump that was attached to the separate concrete pad found about one foot below the bottom of the Frog Pond from seven feet below grade; and
- Two soil samples were collected adjacent to the concrete column (B-FP31) from 11.5 and 18.5 feet below grade.

BASELINE also collected a sample of the fine-grained sand immediately below the cobbles imbedded at the bottom of the concrete column for metals analysis, after the cobbles and sand were excavated. Elevated levels of total chromium, Cr-VI, copper, and nickel were reported in some of the soil samples collected.

2.2.5 Soil Gas Survey – 601 Brush Street

On 24 September 2009, P&D Environmental performed a subsurface investigation for the property adjacent to and southwest of the site, 601 Brush Street. Part of the scope of work included installation of two borings (B6 and B7) and two soil gas probes (SG5 and SG6) on the

southwestern portion of the 751-785 Seventh Street property (P&D Environmental, 2009). Grab groundwater samples were collected from the borings, which were reported to contain methyl tertiary butyl ether ("MTBE") at 0.64 and 8.6 micrograms per liter ("µg/L"), 1,1-dichloroethene at 1.2 and 2.7 µg/L, and TCE at 7.1 and 15 µg/L. Grab groundwater samples collected on the 601 Brush Street property contained 1,1-dichloroethene and TCE at higher concentrations.

The soil gas samples collected on the 751-785 Seventh Street property contained TCE at 3,400 and 5,900 micrograms per cubic meter. Low concentrations of benzene, toluene, ethylbenzene, and xylenes were also reported in one of the samples. The soil gas concentrations reported in the samples collected at the 751-785 Seventh Street property were higher than those collected at 601 Brush Street. However, of the nine soil gas samples collected at 601 Brush Street, five contained the tracer compound 2-propanol used for leak detection in the sampling train, indicating that the five samples collected from the 601 Brush Street property were biased low and may not be reliable.

2.2.6 Phase IV Investigation

In March and April 2010, BASELINE conducted an additional soil and groundwater investigation at the site (BASELINE, 2010). BASELINE installed three shallow groundwater monitoring wells (MW-FP3, MW-FP4A, and MW-FP5) and one deep groundwater monitoring well on the subject property (MW-FP4B) , and one shallow (MW-FP6) and one deep groundwater monitoring well (MW-FP7B) off-site in the downgradient direction. BASELINE collected soil samples during the installation of the wells, which were analyzed for Title 22 metals and hexavalent chromium. Once the wells were installed, BASELINE collected groundwater samples from the new wells, two existing wells on-site, and two off-site wells that are part of a groundwater monitoring network for the adjacent Shell Service Station (MW-3 and MW-9). The groundwater samples were analyzed for VOCs, Title 22 metals, and Cr-VI.

The soil and groundwater investigation found that the shallow aquifer is confined by a layer of clay (Old Bay Mud) that is present at the site at approximately 57 feet bgs. Soil samples collected on-site contained total chromium and Cr-VI at concentrations exceeding environmental screening levels for residential or commercial land use where groundwater is not a potential drinking water source. In addition, the groundwater samples collected both on-site and off-site contained dissolved total chromium, Cr-VI, cobalt, copper, and nickel at concentrations exceeding environmental screening levels for sites where groundwater is not a potential drinking water source. The groundwater samples collected on-site also contained thallium and vanadium at concentrations exceeding environmental screening levels for sites where groundwater is not a potential drinking water source.

None of the groundwater samples collected contained VOCs at concentrations exceeding the environmental screening levels for sites where groundwater is not a potential drinking water source and VOC concentrations in off-site wells are all below environmental screening levels where groundwater is not a potential drinking water source. Nickel, copper, and cobalt are present in off-site wells at concentrations above environmental screening levels where groundwater is not a potential drinking water source.

2.3 Scoping Meeting

A scoping meeting for the soil gas survey proposed for the site has not been conducted. No scoping meeting is scheduled for the soil gas survey.

2.4 Hydrogeology

The site is located within the East Bay Plain Subbasin (DWR, 2004). The East Bay Plain Subbasin is a northwest trending alluvial plain bounded on the north by San Pablo Bay, on the east by the contact with Franciscan Basement rock, and on the south by the Niles Cone Groundwater Basin. The East Bay Plain Basin extends beneath San Francisco Bay to the west. Average precipitation in the subbasin ranges from about 17 inches in the southeast to greater than 25 inches along the eastern boundary; most of the precipitation occurs between the months of November and March.

Past investigations indicate that the lithology is consistent across the site. The soil from the surface to 3 or 4 feet bgs consists of silty sand/sand fill with some brick and concrete debris. Very fine- to fine-grained sands (Merritt Sands) of the San Antonio Formation underlie the fill and are expected to extend to approximately 60 feet bgs. Regional groundwater flow direction in the San Antonio Formation is southwesterly toward the Oakland Inner Harbor. The hydraulic conductivity has been estimated to be 0.005 centimeter per second (Subsurface Consultants and Todd Engineers, 1997). The Merritt Sands is underlain by plastic clay (Old Bay Mud). The Old Bay Mud is the confining layer for the deeper water-bearing formation.

The depth to groundwater at the site, as measured in 2003 and 2005, ranged from 12.3 to 15.5 feet below the TOC. The depths to groundwater measured on 15 April 2010 were used to calculate the groundwater elevation at the wells referenced to the North American Vertical Datum 1988. Groundwater contours based on these elevations are presented on Figure 4. The groundwater flow direction on 15 April 2010 was toward the southwest with gradient of 0.005 (Figure 4).

2.5 Impact on Human Health and/or the Environment

The results of past investigations provide evidence that past use of the site as a plating facility has resulted in metals impact to the soil and groundwater at the site. The analytical results of the soil and groundwater samples collected during previous investigations indicated that the elevated concentrations of metals in the soil and groundwater, primarily Cr-VI, originated from the area of a subsurface concrete column associated with the former Frog Pond. The groundwater impact is confined to the Merritt Sand since the Old Bay Mud, present at approximately 60 feet bgs, acts as a barrier to further vertical migration.

While dissolved cobalt, copper, nickel, thallium, and vanadium were also reported in groundwater samples collected on-site at concentrations exceeding environmental screening levels, the impact is limited since detection of these metals has only been reported in a few soil samples collected on-site. VOCs have been detected in shallow soil samples and grab groundwater samples collected at the site; however, no VOCs were reported at concentrations exceeding the environmental screening levels in the groundwater samples collected from groundwater monitoring wells.

Dissolved hexavalent chromium in the groundwater has migrated as far as 120 feet from the Frog Pond in the southwesterly direction. The results also indicate that the Cr-VI has migrated off-site and the plume appears to be undergoing vertical dispersion as indicated by the increase in the Cr-VI concentration in the deeper off-site well, screened in the Merritt Sands, relative to the deeper on-site well, also screened in the Merritt Sands.

Grab groundwater samples from borings B-FP14, B-FP18, B-FP20, B-FP22 contained elevated concentrations of TCE and 1,2-DCE. Although the reported concentration are below the ESLs for potential vapor intrusion concerns from groundwater (Regional Water Board, 2008), and only trace concentrations were reported in the shallow soils, the soil gas survey conducted for the adjacent property (601 Brush Street, see Section 2.2.5) indicated that TCE vapors were present in soil gas on-site at levels exceeding ESL screening values for potential vapor intrusion.

3. DATA QUALITY OBJECTIVES

3.1 Problem Definition

Based on the findings of past investigations, further assessment of the site is needed to determine whether VOCs are present in the subsurface at the site at levels that could pose a risk to present and future users of the site. Details regarding future redevelopment plans of the site were not available at the time this SAP was prepared. Specifically, the soil gas survey will provide information to address the following question:

Does soil gas underneath the site contain VOCs at concentrations that indicate a potential vapor intrusion concern in existing or future buildings on the site?

The objective of the soil gas survey is to determine whether VOCs are present in the soil gas underneath the site at level that represent a human health hazard. Based on the past investigations at the site, the chemicals of potential concern ("COPCs") for vapor intrusion are TCE and 1,2-DCE.

3.2 Task Description

To obtain the information needed, soil gas samples will be collected within the site boundaries and analyzed for COPCs. The results will be compared against the Regional Water Board's Environmental Screening Levels ("ESLs") (Regional Water Board, 2008). The ESLs are considered conservative risk-based concentrations of chemicals commonly found at contaminated sites; it is used to screen sites with potential environmental concerns related to soil, soil gas, or groundwater using various exposure scenarios and land uses. The presence of an analyte at concentrations at or below the corresponding ESL would not be expected to pose a significant threat to human health or the environment.

If the analytical results indicate that contaminants are present at levels that may pose a risk to human health, BASELINE will recommend further investigation or evaluation of the data, as necessary.

3.3 Data Quality Objective

The purpose of the soil gas survey is to assess potential subsurface impacts at the site due to previous use of the site as a plating facility. The soil gas survey will provide information on the potential presence of contaminants in soil gas underneath the site. Depending on the level of impact, the presence of contaminants in the subsurface could require remediation if a significant health risk to existing or future users of the site is determined. The Data Quality Objective for this SAP is to determine if COPCs are present in the subsurface of the site at concentrations that could pose a threat to human health.

The laboratory reporting limits (mobile laboratory) and action levels for compounds that will be analyzed for soil gas samples are summarized in Table 2. The action levels for soil gas samples are based on the ESLs for evaluation of potential vapor intrusion concerns.

If none of the analytical results exceeds the ESLs, the conditions at site will be considered protective of human health. If any of the analytical results exceed the ESLs, BASELINE may perform further evaluation of the data or recommend further investigation.

The laboratory reporting limits for soil gas have been compared against respective action levels. The laboratory reporting limits of target compounds for soil gas samples are all below the respective action levels.

3.4 Measurement Quality Objectives

Measurement Quality Objectives ("MQOs") have been established for this SAP to assess the viability and usability of data. The MQOs are based on field and laboratory protocols that examine whether the data quality indicators ("DQIs") (i.e., precision, accuracy, representativeness, completeness, comparability, and sensitivity ["PARCCS"]) meet the criteria established for various aspects of data gathering, sampling, or analysis activity. These terms are briefly described below.

- Precision is a measure of the reproducibility of data when multiple samples are collected and analyzed under the same set of conditions.
- Accuracy is the difference between a measured value and an accepted reference or true value. The difference is usually expressed as a percentage.
- Representativeness is the degree to which data accurately and precisely represent an environmental condition.
- Completeness is a measure of the amount of valid data collected from a location compared to the amount that will be expected to be obtained under normal conditions.
- Comparability is a measure of the confidence with which one data set can be compared to another.

The only field measurement that will be taken as part of this investigation will be depth to groundwater measurements.

Depth to groundwater measurements will be recorded using an electronic water level meter with a tape graduated to 1/100 of a foot. The measurements will be recorded to 1/100 of a foot and then measured again to ensure that the measurement is precise. If the difference between the two measurements is more than 1/100 of a foot, then the measurement will be retaken until two successive measurements are in agreement.

Field DQIs will include an air purge step test and a duplicate sample. These samples will provide data regarding the precision, accuracy, and representativeness of samples collected. The measurement performance criteria ("MPC") for the duplicate samples will be a relative percent difference of 50 percent or less.

The sampling completeness value will be calculated after all data have been validated. Data are considered valid when samples are collected and analyzed in accordance with established quality control ("QC") procedures and when none of the QC criteria affecting data usability is exceeded. The sampling completeness value will be calculated by dividing the number of usable data by the total number of data planned to be collected for this investigation. The result will be expressed in terms of percentage. The MPC for completeness will be 90 percent.

The comparability of data can be affected by variations in sampling techniques, analytical methods, and environmental conditions (e.g., weather/seasonal variation). Data comparability for this investigation will be ensured by using the same sampling techniques, analytical method, and analytical laboratory for all samples collected from the site throughout this investigation. Weather/seasonal variation is not expected to affect data comparability since collection of all samples is expected to be completed in one day.

The mobile laboratory will calibrate equipment and analyze samples in accordance with EPA Method 8260B for VOCs. Procedures for analyses of soil gas samples will include blank, surrogate, and laboratory control samples. The DQIs for VOC analyses are presented in the laboratory's Standard Operating Procedures included in Appendix A.

3.5 Data Review and Validation

The original laboratory reports will be kept in BASELINE's permanent file. All data will include the date, initials of the sampler, and relevant analytical information. The acceptability of the data is determined by the PARCCS criteria stated above (see Section 3.4 Measurement Quality Objectives). The results of the evaluation will be documented by the PM as part of the QC Checklist for Review of Laboratory Report ("QA/QC checklist") and placed in the permanent file with the original laboratory reports. A copy of the QA/QC checklist is provided in Appendix B. If the evaluation indicates non-compliance with an established procedure or requirement, a recommendation for corrective action will be documented on the QA/QC checklist.

Sample data will be accepted without qualification for all data reviewed by BASEINE with favorable responses on the QA/QC checklist. The definition of favorable is the answer selected that does not indicate a problem with the data and/or that the data are not flagged with any qualifier described below. For all questions on the QA/QC checklist, the favorable answer is "YES."

BASELINE will review the analytical data, and assign data qualifiers, if required, in accordance with EPA guidelines (EPA, 2002; EPA, 2008). BASELINE may assign data validation qualifiers to particular sample results based on information such as the laboratory case narrative, laboratory qualifiers, and laboratory QC data. The specific criteria for accepting sample data and a description of the data qualifiers that could be assigned to the data are as follows:

- For all analytical data reviewed by BASELINE that meet acceptance criteria on the QA/QC checklist, the data will be accepted without qualification. For data meeting the QA/QC acceptance criteria, the answer to all questions on the QA/QC checklist, is "YES." These data will not require an assigned qualifier as described below.
- BASELINE may assign a "J" qualifier to indicate that an analyte was positively identified and the associated concentration is approximate. The detected concentration is approximate if certain laboratory QC criteria were not met. For example, a J qualifier could be assigned because surrogate recoveries were above the laboratory control limits (indicating a high bias), or the method holding time was exceeded (but not grossly exceeded). A J-qualified result should be considered an estimated concentration, but may be used without modification for making decisions about the site; as such, re-sampling or re-analysis is not required.
- BASELINE may assign a "UJ" qualifier to indicate that an analyte was not detected at a level greater than or equal to the method detection limit, and that the associated non-detect result is approximate because certain QC criteria were not met. The UJ-flagged data, although considered approximate, may be used without modification for making decisions about the site; as such, re-sampling or re-analysis is not required.
- BASELINE may assign a "U" qualifier to indicate that an analyte was analyzed for, but was not detected at a level greater than or equal to the method detection limit for the sample and analytical method. The U qualifier will be assigned when sample contamination is suspected based on detections of target analytes in an associated blank sample. For suspected contaminated data, the method detection limit will be raised to the concentration detected in the sample, and the result will be assigned a U qualifier, and treated as a non-detect result. The primary issue for U-qualified data is how non-detect results will be treated for statistical analyses (e.g., for non-detects use the method detection limit, one-half the method detection limit, or a statistical distribution of the method detection limits). Statistical analyses are not proposed for the evaluation of the analytical data collected for this investigation. Consequently, the use of U-qualified data will have no effect on site decisions, except that a U-qualified result should be treated as a non-detect result with an elevated reporting limit. Re-sampling or re-analysis is not required.
- BASELINE may assign an "R" qualifier to indicate that the data are unusable due to the quality of the data generated because certain QC criteria were not met. The analyte may or may not be present in the sample. An R qualifier could be assigned if QC criteria or method holding times are grossly exceeded. Data that are R-flagged are rejected and cannot be used to make decisions about the site. Re-sampling and/or re-analysis may be performed and the new data will be subject to review per BASELINE's QA/QC checklist and EPA guidelines.

3.6 Data Management

This section describes, in general, how site data will be recorded, tracked, stored, and analyzed. The two primary types of data are field data and laboratory data. Data management for each are described below.

3.6.1 Field Data Management

In general, field data will include field measurements, field notes, and sample transmittal documents.

Field data will be recorded on the following forms:

- Daily Field Log; and
- Chain-of-Custody Form ("COC").

Examples of these forms are shown in Appendix C. All paper copies of these forms and reports will be maintained in the permanent files in BASELINE's Emeryville office.

3.6.2 Laboratory Data Management

Electronic data are generally derived from automated data acquisition systems. Analytical instruments are equipped with software that performs various manipulations, identifications, and calculations of data. Software calculations are verified manually during the data validation process. Other data generated by the analytical laboratory consist of manually recorded results, such as sample weight. This data is documented in a laboratory daily worksheet and subsequently entered into electronic files. The electronic data undergoes a QC check against the daily worksheets to ensure accuracy prior to submission of the report. Any errors encountered will trigger further auditing until no transcription errors are encountered in the audit set.

Raw analytical data that require further reduction to produce usable results are reduced according to procedures defined in the referenced analytical method or laboratory standard operating procedure for the activity. After the data have been generated, they are subjected to a three-tiered review process similar to the one described below. This review process includes verifying the electronic identifications and calculations performed by the software and a technician.

The analytical laboratory will perform a three-level review consisting of the following steps. The first level of review is performed by a responsible technician. The technician verifies that QC acceptance criteria have been met and that instrument operating conditions were appropriate for the analysis performed. The second level is a peer review of the technician's observations, calculations, and QC criteria. A preliminary report is assembled, assuming any anomalies identified by the peer have been reconciled. A senior staff member performs the final, or third level, review, which consists of the same checks on the final report as those performed during the second level of review. The QA Manager or their designee will also perform reviews of work products as part of their audits.

- Laboratory data will be reported in a preliminary electronic report (this report does not include a signature from a laboratory representative, a case narrative, and a copy of the COC) and a final electronic report (signed by the laboratory representative). The preliminary and

final laboratory reports are provided in portable document format. The preliminary data are generally reported in summary form including sample identification information, results for the sample analyses, and a summary of the QC data including calibrations and verifications of precision, and accuracy, where appropriate.

3.7 Assessment Oversight

When the laboratory data is completely transferred to BASELINE, BASELINE will assume responsibility for managing the data. All chemical data generated during implementation of this SAP will be stored in a Microsoft Excel file. The data will be maintained and updated by the PM or designee. BASELINE's Quality Assurance Officer ("QAO") will be responsible for verifying data from the mobile laboratory are accurate and consistent. Data entered into a spreadsheet for production of a report will originate from the final laboratory report. BASELINE's QAO will check the report's summary tables against the final laboratory report. Field data such as sample depths will be entered into the report tables by the PM or designee using standardized worksheets. BASELINE's QAO will check the report's summary tables and any figures produced against the daily field and/or boring logs. Corrections will be made with a red pen and a copy retained in the permanent file. Prior to finalization of the report, BASELINE's QAO will verify all corrections have been made.

4. SAMPLING DESIGN

This section presents the rationale for collection and analysis of soil gas samples at the site. The rationale for each sample and the respective analytical parameters are summarized in Table 3.

4.1 Soil Gas Survey

BASELINE will collect soil gas samples from six locations within the site (SG-01 through SG-06 on Figure 5). The soil gas samples will be used to determine whether chlorinated hydrocarbon vapors are present in the vadose zone at levels that represent a health risk to existing and future users at the site. The soil gas samples will be collected at 5 and 10 feet bgs.

5. REQUEST FOR ANALYSIS

This section provides information on the analytical method to be used to measure COPCs for each sample and the laboratory that will perform requested analyses.

5.1 Analysis Narrative

Implementation of this SAP will involve analysis of soil gas samples collected from the site. Soil gas samples will be analyzed using a mobile laboratory operated by TEG. The laboratory is California state-certified to perform the analysis proposed. BASELINE will ensure that the laboratory has current certification by the California Department of Health Services Environmental Laboratory Accreditation Program for EPA Method 8260B.

The soil gas samples will be analyzed for VOCs in accordance with EPA Method 8260B and will have an expected detection limit of 0.1 microgram per liter ("ug/L"). One duplicate sample will be collected from SG-04 at 5.0 feet bgs and analyzed for QA/QC. This is near the locations where elevated TCE was reported in grab groundwater samples.

The number of samples and analytical methods for the soil gas samples is summarized on Table 4. The container, preservation requirement, and holding time for soil gas samples are presented on Table 5.

6. FIELD METHODS AND PROCEDURES

This section presents procedures for collecting soil gas samples at the site.

6.1 Field Equipment and Supplies

Field equipment and supplies required during field activities include:

- Drill rig (Direct Push Technology);
- Mobile laboratory (for analysis of soil gas samples);
- Personal protective equipment ("PPE") (hard hat, high-visibility vest, and nitrile gloves;
- Tape measure;
- Water level meter;
- Syringe (to be provided by TEG); and
- Soil vapor probe (to be provided by TEG).

All equipment and instruments that will be used during field activities will be maintained and calibrated to operate within manufacturers' specifications so that the required sensitivity and QA/QC parameters are upheld. A copy of the operating manuals for the field instruments will be kept with those instruments. William Scott is BASELINE's Field Equipment Maintenance Supervisor and is responsible for instructing field personnel in proper maintenance and calibration procedures for field equipment. Field personnel are responsible for maintaining field equipment in proper operating condition.

Routine daily field maintenance of field equipment will include:

- Removal of surface dirt and debris from exposed surfaces of the sampling equipment and measurement systems;
- Storage of equipment away from the elements;
- Daily inspections of sampling equipment and measurement systems for possible problems (e.g., cracked or clogged lines or tubing or weak batteries); and
- Charging any battery packs for equipment when not in use.

6.1.1 Calibration of Field Equipment

No field equipment will be used that will require calibration.

6.2 Permitting and Utility Clearance

Prior to field activities, BASELINE will obtain a drilling permit from the Alameda County Public Works Agency ("ACPWA") and contact Underground Service Alert ("USA") to clear

proposed soil gas boring locations. Proposed soil gas boring locations will be relocated, as appropriate, if a conflict with underground utilities is identified by USA. Access to the site will be coordinated with the Brush Street Group by BASELINE.

6.3 Field Screening

No field screening will be performed.

6.4 Soil Gas Survey

Twelve soil gas samples will be collected from six locations as shown on Figure 5. BASELINE will contract with TEG Northern California, Inc. ("TEG"), a licensed drilling company that specializes in soil gas sample collection, to advance shallow soil borings using a direct push technique and install temporary soil gas probes Soil gas samples will be collected at 5 and 10 feet bgs at each location. The temporary probes will be driven to the target sample depth and the outer rod pulled back to expose the inlet to the soil gas probe. Hydrated bentonite will be used to seal around the drive rod at the surface to prevent ambient air intrusion from occurring. The soil gas samples will not be collected for at least 20 minutes following installation of the soil gas probes.

The soil gas will be collected using calibrated glass syringes and analyzed on-site using a mobile California-certified analytical laboratory operated by TEG. Sample flow rate will be controlled by withdrawing the plunger on the syringe at a constant rate, which will not exceed 200 milliliters per minute. Prior to collection of the first soil gas sample, a purge test will be conducted at sample location SG-04. Three soil gas samples will be collected: one sample after purging one purge volume, one sample after purging three purge volumes, and one sample after purging seven purge volumes. The purge volume that yields the highest concentration of TCE will be used as the purge volume to be removed from the remaining locations prior to sampling.

During sampling, isopropanol will be sprayed on the aboveground fittings for leak detection. Isopropanol is not expected to be present in the subsurface and will be included in the analytical list as a tracer indicator of leaks.

All soil gas samples will be analyzed on-site for volatile organics using a mobile laboratory operated by TEG. Analysis of soil gas samples will be performed immediately following collection. A duplicate sample will also be collected from boring location SG-04 at 5.0 feet bgs.

6.4.1 Water Level Measurements

In addition to collecting soil gas samples, BASELINE will measure the depth to groundwater from the ground surface in groundwater monitoring wells MW-FP1, MW-FP2, and MW-FP4A (Figure 2). An electronic water level meter calibrated to 1/100 of a foot will be used to measure depth to groundwater in a temporary well. The depth to groundwater will be measured twice to confirm the accuracy and precision of the measurement. If the difference between the two measurements is more than 1/100 of a foot, then the measurement will be retaken until two successive readings are in agreement. The water level meter will be decontaminated before and after use by washing in Alconox and water solution followed by rinsing with deionized water.

6.5 Decontamination Procedures

Decontamination of soil vapor sampling equipment will be performed by washing them prior toeach sample collection in the following sequence: 1) a solution of Alconox mixed with clean water (a brush will be used as necessary to remove any debris adhering to the sampling equipment); 2) clean water; and 3) final rinse in de-ionized (DI) water. Anytime the water becomes visibly dirty, it will be replaced.

6.6 Sample Labeling

All samples collected will be labeled in a clear and precise way for proper identification in the field and for tracking in the laboratory. The samples will have pre-assigned, identifiable, and unique numbers. The sample labels will contain the following information:

- BASELINE's name and phone number;
- Project name;
- Unique sample identification;
- Time and date of sample collection;
- Analyses requested; and
- Sampler's initials.

An example of the sample label is provided in Appendix C.

6.7 Chain of Custody Forms and Custody Seals

A copy of the chain of custody form to be used in provided in Appendix C. Since a mobile laboratory will be used on-site, custody seals will not be used.

7. SAMPLE CONTAINERS, PRESERVATION REQUIREMENTS, AND PACKAGING AND SHIPPING

This section presents information regarding sample containers, preservation requirements, and packaging and shipping procedures for each sample matrix.

7.1 Sample Containers and Preservation Requirements

7.1.1 Soil Gas Sample

Soil gas samples will be collected in a syringe supplied by TEG. A new syringe will be used for each sample location and for collection of a duplicate sample. No preservative is required for all soil gas samples. All soil gas samples will be analyzed on-site using a mobile laboratory operated by TEG.

7.2 Packaging and Shipping

Since a mobile laboratory will be used on-site, samples will not be packed or shipped.

8. DISPOSAL OF RESIDUAL MATERIALS

In the process of collecting environmental samples, the sampling activity will generate different types of potentially contaminated investigation-derived wastes ("IDW") that will include the following:

- Used PPE (e.g., nitrile gloves); and
- Disposable sampling equipment (e.g., tubing).

Used PPE and disposable sampling equipment will be bagged and placed in a municipal refuse dumpster. These wastes are not considered hazardous and can be sent to a municipal landfill. Any PPE and disposable equipment that is to be disposed of, but can still be reused, will be rendered inoperable before disposal in a refuse dumpster.

The decontamination rinsate water derived from the sampling will disposed of into the sanitary sewer system.

9. DOCUMENTATION OF FIELD ACTIVITIES

This section describes the procedures for documenting field activities.

9.1 Field Logs

Field personnel are responsible for recording the activities performed and pertinent observations in a Daily Field Log (Appendix C). After field sampling activities, field documents will be checked by field personnel and then peer reviewed to confirm that correct sampling procedures were adhered to and that field data are coherent. The Daily Field Log will document any deviations from this SAP. The PM will ensure that all such deviations are documented. The original records from field activities will be kept in BASELINE's permanent file. At a minimum, the following information will be recorded in the Daily Field Log:

- Field observations and details related to analysis or integrity of samples (e.g., weather conditions, noticeable odors, etc.);
- Time of arrival and departure from the site;
- Other site personnel and visitors (e.g., inspectors);
- Deviations from sampling plans, site safety plans, and SAP procedures;
- Changes in personnel and responsibilities with reasons for the changes; and
- Levels of safety protection.

9.2 Photographs

Photographs will be taken of field activities or other areas of interest at the site. The photographs will serve to verify information entered in the Daily Field Log. For each photograph taken, the following information will be written in a logbook or recorded in a separate field photography log:

- Time, date, location, and weather conditions;
- Description of the subject photographed; and
- Name of person taking the photograph.

10. QUALITY CONTROL

This section discusses the QC samples that will be collected to support the sampling activity. The QC samples will consist of a field duplicate.

10.1 Field Quality Control Samples

Field QC samples are intended to help evaluate conditions during field activities and are intended to accomplish two primary goals, assessment of field contamination and assessment of sampling variability. The former looks for substances introduced in the field due to environmental or sampling equipment and is assessed using blanks of different types. The latter includes variability due to sampling technique and instrument performance as well as variability possibly caused by the heterogeneity of the matrix being sampled and is assessed using replicate sample collection. The following subsections cover field QC.

10.1.1 Assessment of Field Contamination (Blanks)

Field contamination is usually assessed through the collection of different types of blanks. Equipment blanks are obtained by passing distilled or deionized water, as appropriate, over or through the decontaminated equipment used for sampling. Because the soil gas samples will be analyzed in a mobile laboratory on-site, and an ambient air sample could contain target compound, a field equipment blank will not be collected.

10.2 Assessment of Field Variability (Field Duplicate)

To assess field variability, a duplicate soil gas sample will be collected at SG-04 at 5.0 feet bgs after the standard soil gas sample and under identical conditions. The duplicate sample will be subjected to the same analyze as the standard sample. The objective of collecting field duplicates is to assess analytical result variability, which may be due to laboratory error or dynamics of the soil gas in the subsurface.

10.3 Laboratory Quality Control Samples

TEG's analytical procedures include blank and a leak check compound. TEG's QC policies, practices, and procedures are included in Appendix A.

11. FIELD VARIANCES

As conditions in the field may vary, it may become necessary to implement minor modifications to the sampling procedures presented in this SAP. When appropriate, the QAO will be notified and a verbal approval will be obtained before implementing changes. Modifications to the approved plan will be documented in the sampling report.

11. FIELD VARIANCES

As conditions in the field may vary, it may become necessary to implement minor modifications to the sampling procedures presented in this SAP. When appropriate, the QAO will be notified and a verbal approval will be obtained before implementing changes. Modifications to the approved plan will be documented in the sampling report.

12. HEALTH AND SAFETY PROCEDURES

Field activities as described in this SAP will be performed in accordance with the HSP. A copy of the HSP is included in Appendix D. In accordance with the HSP, all field personnel engaged in sampling activities will be trained in accordance with 29 Code of Federal Regulations Part 1910.120 Hazardous Waste Operations and Emergency Response and 8 California Code of Regulations Section 5192.

13. REFERENCES

BASELINE, 2010, Phase IV Soil and Groundwater Investigation, 751-785 Seventh Street, Oakland, California, 28 May.

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BASELINE, 2006, Report on Phase II and Focused Phase III Investigation and Frog Pond Removal Workplan, 785-7th Seventh Street, Oakland, California, June.

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California Department of Water Resources ("DWR"), 2004, California's Groundwater Santa Clara Valley Groundwater Basin Bulletin 118, 27 February.

P&D Environmental, 2009, Subsurface Investigation Report, (SG1 through SG6 and B6 through B8), 601 Brush Street, 12 November.

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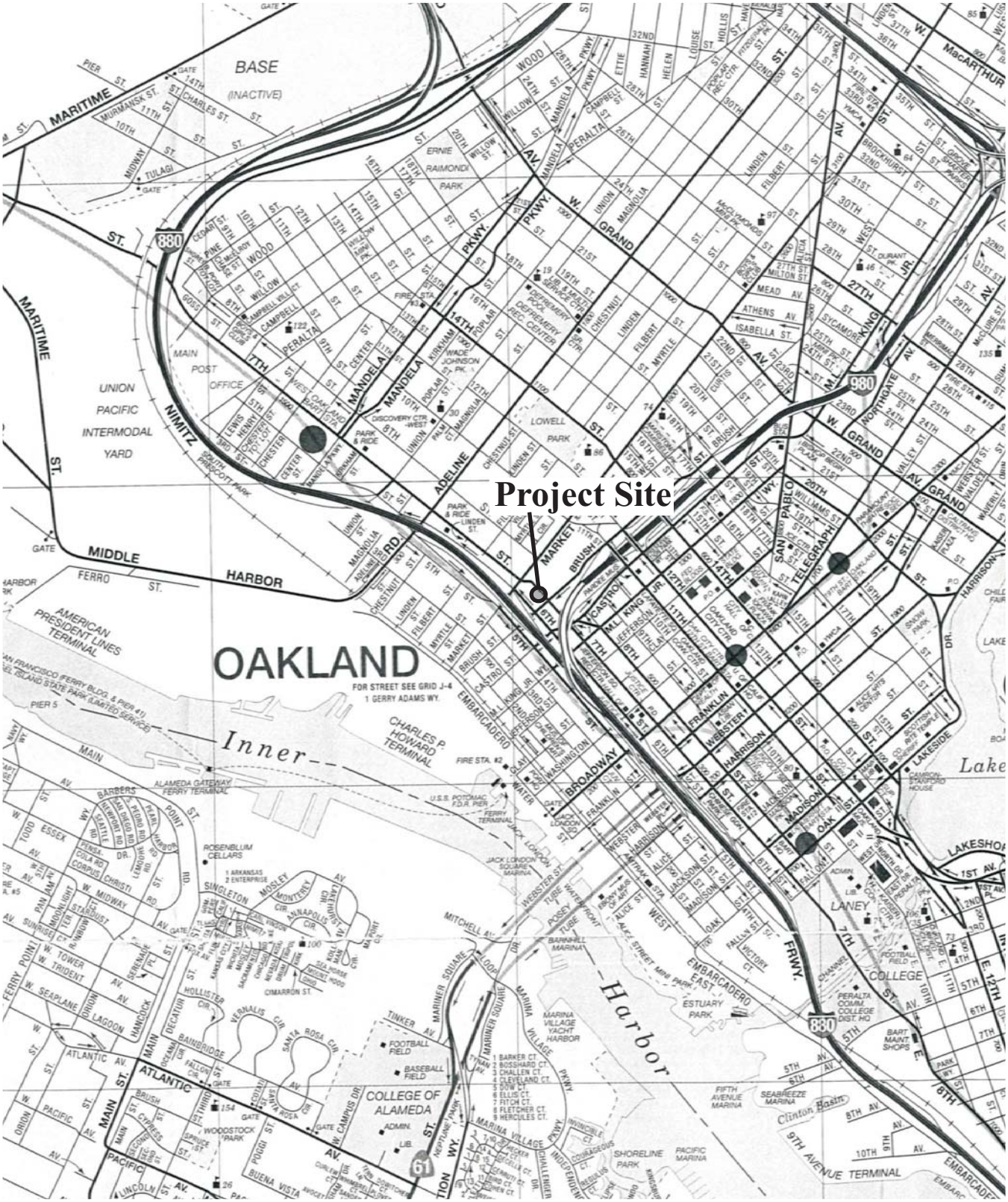
Subsurface Consultants and Todd Engineers, 1997, Draft Hydrogeologic Investigation, 50-Foot Navigation Improvement Project, Port of Oakland, December.

U.S. Environmental Protection Agency ("EPA"), 2009, Sampling and Analysis Plan, Guidance and Template, Version 3, Brownfields Assessment Projects, R9QA/008.1, September.

FIGURES

REGIONAL LOCATION

Figure 1



751-785 Seventh Street
Oakland, California

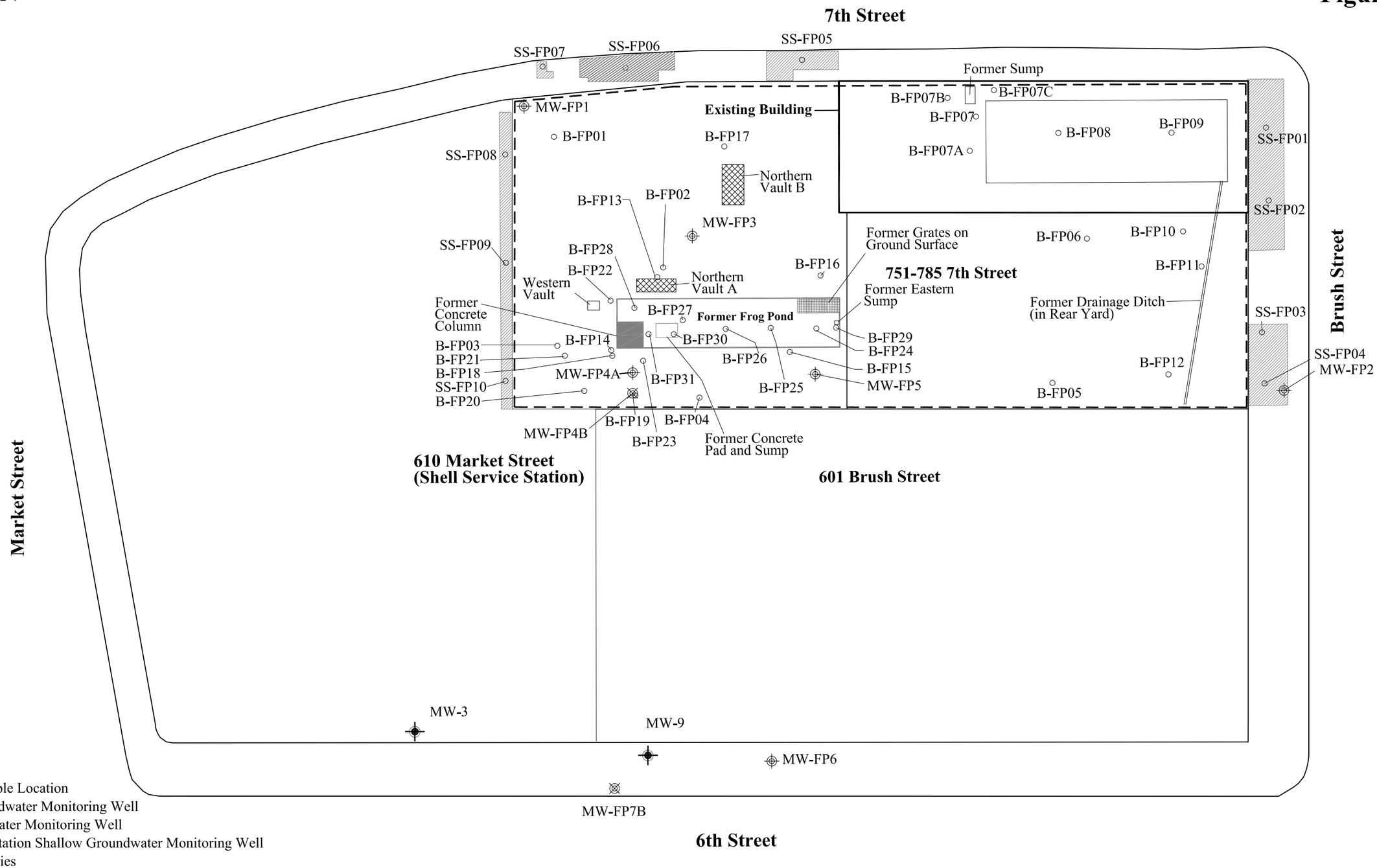
0 2000 Feet

BASELINE

Y0323-04.01689.Fig1.cdr 05/12/11

SITE PLAN

Figure 2



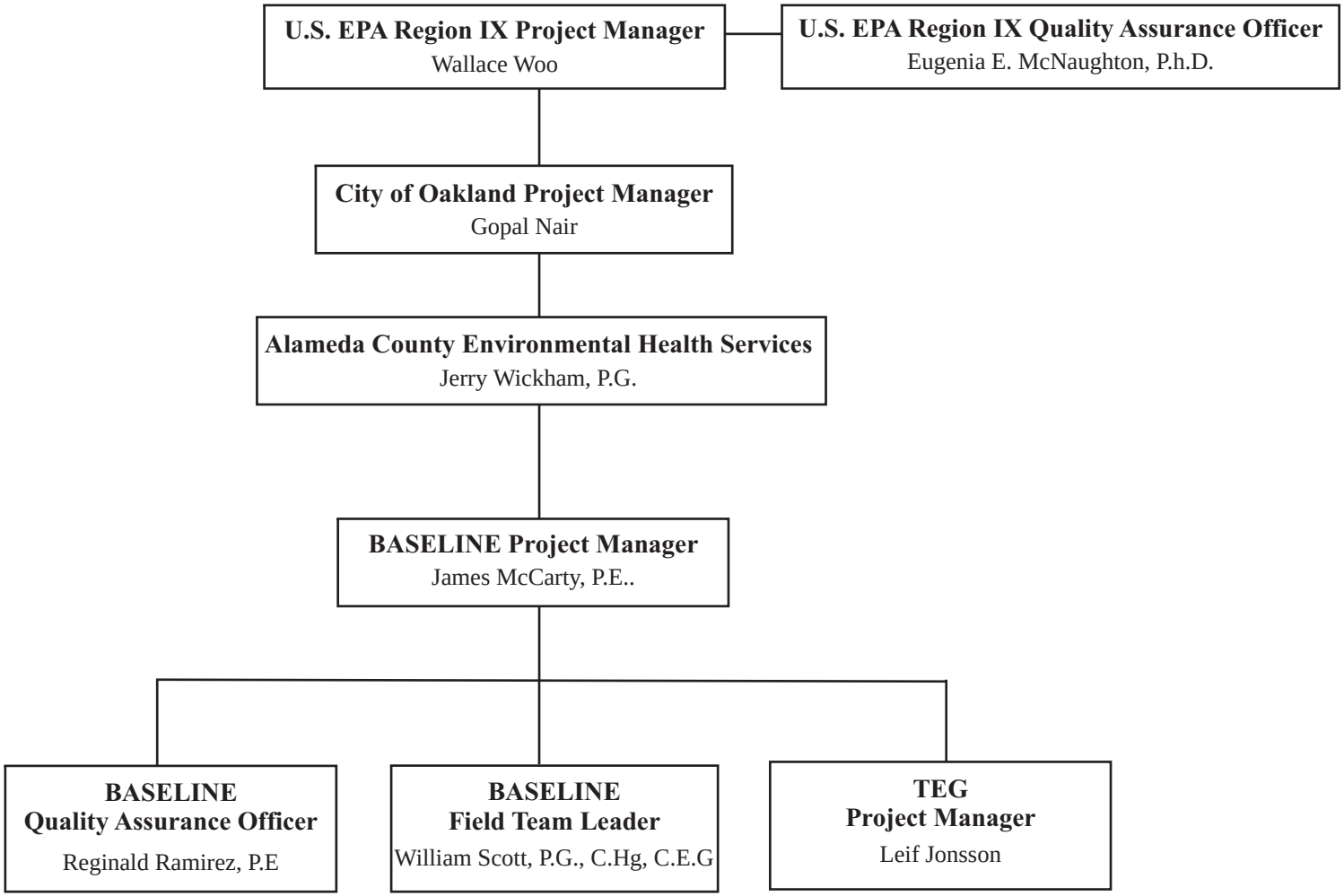
751 - 785 Seventh Street
Oakland, California

Y0323-04.01689.Fig2.dwg 05/12/11

BASELINE

ORGANIZATION CHART

Figure 3



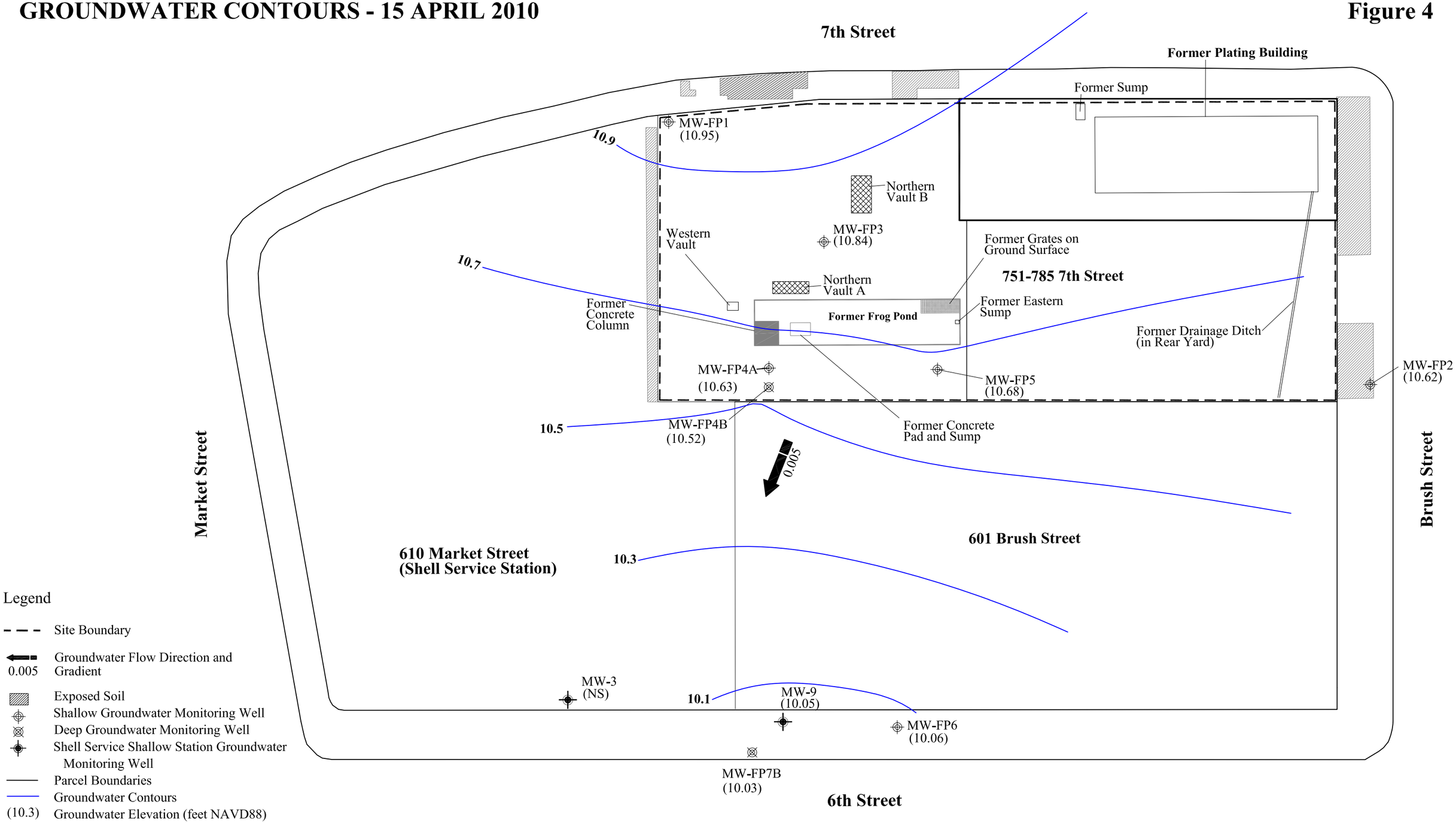
711 71st Avenue
Oakland, California

BASELINE

Y0323-04.01684.Fig3.cdr 05/12/11

GROUNDWATER CONTOURS - 15 APRIL 2010

Figure 4



Legend

- Site Boundary
- 0.005 — Groundwater Flow Direction and Gradient
- Exposed Soil
- Shallow Groundwater Monitoring Well
- Deep Groundwater Monitoring Well
- Shell Service Shallow Station Groundwater Monitoring Well
- Parcel Boundaries
- Groundwater Contours
- (10.3) — Groundwater Elevation (feet NAVD88)

751 - 785 Seventh Street
Oakland, California

Note: Elevations based on North American Verticle Datum 1988 (NAVD88)
NS = not surveyed

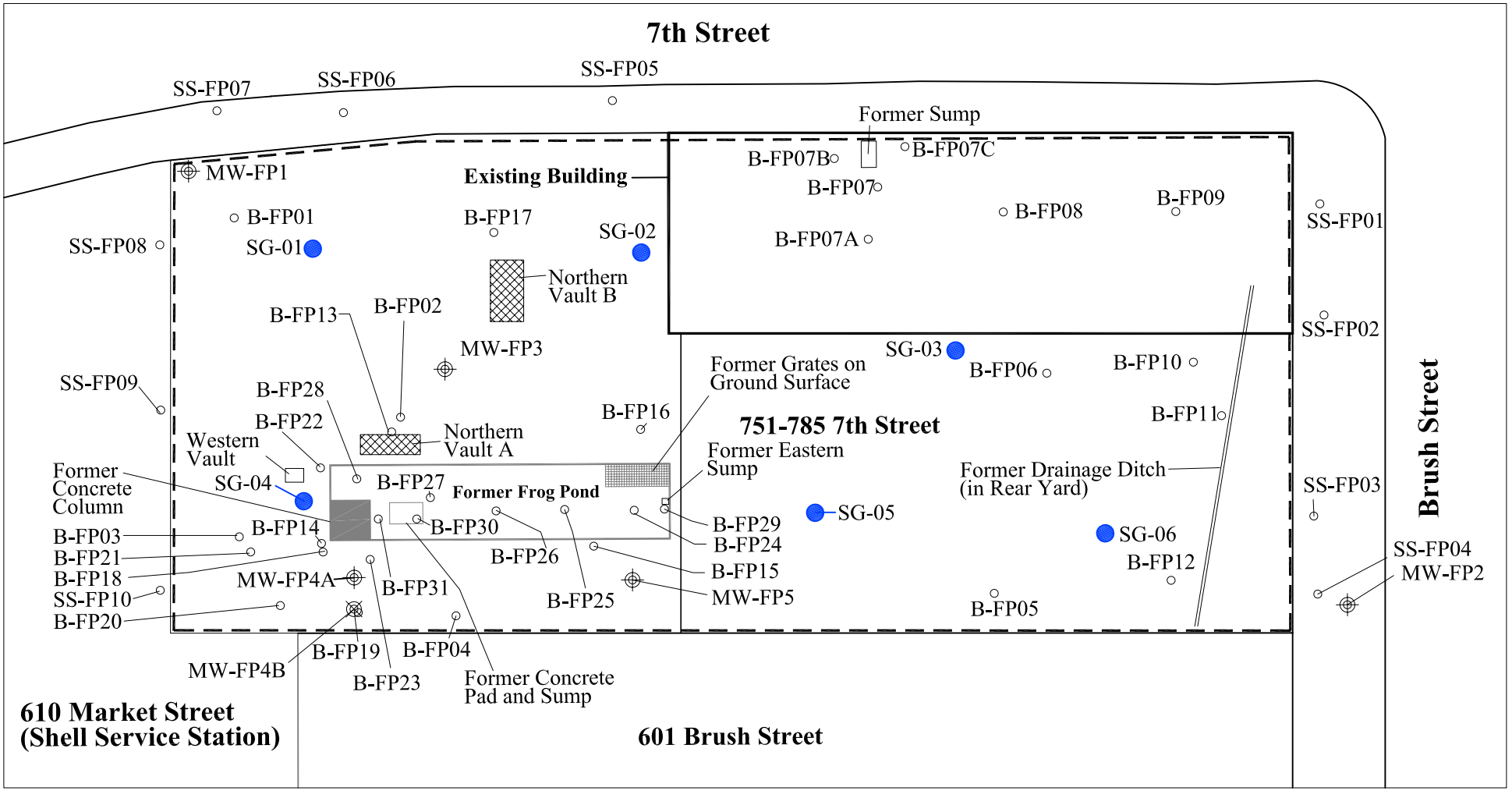
0 30 Feet

BASELINE

Y0323-04.01689.Figure4.dwg 05/10/11

PROPOSED SOIL GAS SAMPLE LOCATIONS

Figure 5



Legend

- Site Boundary
- Boring or Sample Location
- Shallow Groundwater Monitoring Well
- Proposed Soil Gas Sample Location
- Deep Groundwater Monitoring Well

751 - 785 Seventh Street
Oakland, California

0 30 Feet

BASELINE

Y0323-04.01689.Fig5.dwg 05/12/11

TABLES

TABLE 1: Key Personnel Contact Information and Responsibilities
751-785 Seventh Street, Oakland, California

Title	Name	Phone Number/ Email Address	Responsibilities
U.S. Environmental Protection Agency ("EPA") Project Manager ("PM")	Wallace Woo	(415) 972-3270/ woo.wallace@epa.gov	Provide technical review and advice to City of Oakland ("City") regarding environmental documents submitted by BASELINE Environmental Consulting ("BASELINE").
U.S. EPA Quality Assurance Officer ("QAO")	Eugenia E. McNaughton, Ph.D.	(415) 972-3807/ mcnaughton.eugenia@epa.gov	Review the Sampling and Analysis Plan ("SAP") to ensure that it meets EPA requirements.
City of Oakland PM	Gopal Nair	510 238-6361 gnair@oaklandnet.com	Manage the Brownfields grant for the City and ensure that environmental site assessment activities are performed in accordance with EPA requirements.
Alameda County Environmental Health Services	Jerry Wickham, P.G.	510 567-6791 jerry.wickham@acgov.org	Provides regulatory oversight for the property.
BASELINE Environmental Consulting PM	James McCarty, P.E.	(510) 420-8686/ redgy@baseline-env.com	Ensure that personnel implement the appropriate procedures outlined in this document.
BASELINE Environmental Consulting QAO	Reginald Ramirez, P.E.	(510) 420-8686/ jim@baseline-env.com	Oversee the implementation of the SAP, including whether specified Quality Control procedures are being followed as described in this document.
BASELINE Enviromental Consulting Field Team Leader	William Scott, P.G., C.E.G, C.Hg.	(510) 420-8686/ bill@baseline-env.com	Oversee the field activities, review and ensure accuracy and completeness of field and logs and maintain equipment used during field investigation.
TEG Northern California (driller and mobile analytical laboratory) PM	Leif Jonsson	(916) 853-8010/ leif@tegncal.com	Ensure safe operation of drill rig and proper calibration of mobile laboratory. Responsible for informing the BASELINE Field Team Leader of any problems related to field equipment or chemical analysis.

TABLE 2: Laboratory Reporting Limits and Action Levels, Soil Gas (µg/m^3)
751-785 Seventh Street, Oakland, California

Analytical Parameter	Laboratory Reporting Limits	Action Levels
1,1,1,2-Tetrachloreothane	100	1,100
1,1,1,-Trichloroethane	100	1,300,000
1,1,2,2-Tetrachloroethane	100	140
1,1,2-Trichloroethane	100	510
1,1-Dichloroethane	100	5,100
1,1-Dichloroethene	100	120,000
1,2-Dichloroethane	100	310
Benzene	100	280
Carbon Tetrachloride	100	63
Chloroethane	100	58,000
Chloroform	100	1,500
cis-1,2-Dichloroethene	100	20,000
Dichlorodifluoromethane (Freon 12)	100	NE
Ethylbenzene	100	3,300
m,p-Xylene	200	58,000 [1]
Methylene Chloride	100	17,000
o-Xylene	100	58,000 [1]
Tetrachloroethene	100	1,400
Toluene	200	180,000
trans-1,2-Dichlroethene	100	41,000
Trichloroethene	100	4,100
Trichlorofluoromethane	100	NE
1,1,2-Trichloro-trifluoroethane	100	NE
Vinyl Chloride	100	100

Notes:
µg/m^3 = micrograms per cubic meter.
NE = not established.

Soil gas samples would be analyzed using a state-certified analytical laboratory in accordance with EPA Method 8260B.
Action levels are based on the San Francisco Regional Water Quality Control Board's Environmental Screening Levels for evaluation of potential vapor intrusion concerns (Regional Water Board, 2008).

[1] Value for total xylenes.

TABLE 3: Sampling Design and Rationale
751-785 Seventh Street, Oakland, California

Sampling Location	Sampling ID	Sampling Depth Interval (feet bgs)	Analytical Parameter	Rationale
SG-01	SG-01@5	5.0	VOCs	Location: Northwest quadrant of the site. Depth: per DTSC guidance. Analysis: to determine the potential presence of VOCs in the vadose zone underneath the site.
SG-01	SG-01@10	10.0	VOCs	Location: Northwest quadrant of the site. Depth: per DTSC guidance. Analysis: to determine the potential presence of VOCs in the vadose zone underneath the site.
SG-02	SG-02@5	5.0	VOCs	Location: Next to existing building. Depth: per DTSC guidance. Analysis: to determine the potential presence of VOCs in the vadose zone underneath the site.
SG-02	SG-02@10	10.0	VOCs	Location: Next to existing building. Depth: per DTSC guidance. Analysis: to determine the potential presence of VOCs in the vadose zone underneath the site.
SG-03	SG-03@5	5.0	VOCs	Location: Next to existing building. Depth: per DTSC guidance. Analysis: to determine the potential presence of VOCs in the vadose zone underneath the site.
SG-03	SG-03@10	10.0	VOCs	Location: Next to existing building. Depth: per DTSC guidance. Analysis: to determine the potential presence of VOCs in the vadose zone underneath the site.
SG-04	SG-04@5	5.0	VOCs	Location: Area with highest VOCs in grab groundwater samples. Depth: per DTSC guidance. Analysis: to determine the potential presence of VOCs in the vadose zone underneath the site.
SG-04	SG-04@10	10.0	VOCs	Location: Area with highest VOCs in grab groundwater samples. Depth: per DTSC guidance. Analysis: to determine the potential presence of VOCs in the vadose zone underneath the site.

TABLE 4: Analytical Methods, Soil Gas
751-785 Seventh Street, Oakland, California

Sample Identification	Sample Location	EPA Method 8260
SG-01@5	SG-01	1
SG-01@10	SG-01	1
SG-02@5	SG-02	1
SG-02@10	SG-02	1
SG-03@5	SG-03	1
SG-03@10	SG-03	1
SG-04@5	SG-04	5
SG-04@10	SG-04	1
SG-05@5	SG-05	1
SG-05@10	SG-05	1
SG-06@5	SG-06	1
SG-06@10	SG-06	1
Total number of Soil Samples, excluding QC:		15
Total number of Soil Samples, including QC:		16

Notes:
See Figure 5 for sampling locations.
VOCs = volatile organic compounds.

TABLE 3: Sampling Design and Rationale
751-785 Seventh Street, Oakland, California

Sampling Location	Sampling ID	Sampling Depth Interval (feet bgs)	Analytical Parameter	Rationale
SG-05	SG-05@5	5.0	VOCs	Location: Approximate sample location from previous soil gas survey. Depth: per DTSC guidance. Analysis: to determine the potential presence of VOCs in the vadose zone underneath the site.
SG-05	SG-05@10	10.0	VOCs	Location: Approximate sample location from previous soil gas survey. Depth: per DTSC guidance. Analysis: to determine the potential presence of VOCs in the vadose zone underneath the site.
SG-06	SG-06@5	5.0	VOCs	Location: Approximate sample location from previous soil gas survey. Depth: per DTSC guidance. Analysis: to determine the potential presence of VOCs in the vadose zone underneath the site.
SG-06	SG-06@10	10.0	VOCs	Location: Approximate sample location from previous soil gas survey. Depth: per DTSC guidance. Analysis: to determine the potential presence of VOCs in the vadose zone underneath the site.

Notes:
See Figure 5 for sampling locations.
bgs = below ground surface.
VOCs = volatile organic compounds.
DTSC = Department of Toxic Substance Control

TABLE 5: Analytical Methods, Containers, Preservation Requirements, and Holding Times
751-785 Seventh Street, Oakland, California

Sample Matrix	Analytical Parameter	Analytical Method	Containers	Preservation Requirements	Holding Time
Soil Gas	VOCs	EPA Method 8260	Syringe	None	30 minutes

Notes:
EPA = U.S. Environmental Protection Agency.
VOCs = volatile organic compounds.

APPENDIX A

LABORATORY STANDARD OPERATING PROCEDURES

SOIL VAPOR SURVEY METHODOLOGY

DTSC Protocols

Active Soil Vapor Sampling System

TEG's low-dead volume soil vapor sampling system has been inspected, endorsed, and is favored by all regulatory agencies who have seen it, including the EPA and CA DTSC. The design eliminates the risk of air leakage down the soil vapor probe, ensures sample collection from the tip, and greatly facilitates decontamination procedures.

Probe Construction

TEG's soil vapor probes are constructed of 1 inch outer diameter chrom-moly steel, equipped with a steel drop off tip. The Strataprobe can use a larger diameter probe if needed. Nominal lengths are 4 feet and additional lengths may be added to one another to achieve the required sampling depth. An inert 1/8 inch tube runs through the center of the probe and is attached to the sampling port with a stainless steel post run fitting.

Probe Insertion

The probe is driven into the ground with an electric rotary hammer, or with the Strataprobe. After inserted to the desired depth, the probe is retracted slightly, which opens the tip and exposes the vapor sampling port. This design prevents clogging of the sampling port and cross-contamination from soils during insertion. Once the probe rod is placed, the sample can be collected after waiting twenty minutes for equilibration.

Soil Gas Sampling

Soil vapor is withdrawn from the inert tubing using a calibrated syringe connected via an on-off valve. A purge volume test is conducted by sampling at the first soil vapor location three times after sequentially collecting and discarding one, three, and seven dead volumes of soil vapor gas to flush the sample tubing and fill it with in-situ soil vapor. The purge volume used prior to the sample yielding the highest analytical value is used for all subsequent sampling. After purging, the next 20cc to 50cc of soil vapor are withdrawn in the syringe, plugged, and immediately transferred to the mobile lab for analysis within the required holding time. During sampling, a leak check gas is used to confirm that the sample train and probe rod is tight and leak free. Additional soil vapor may be collected and stored in gas-tight containers (e.g. Summa canisters) as desired.

Flushing & Decontamination Procedures

To minimize the potential for cross-contamination between sites, all external probe parts are cleaned of excess dirt and moisture prior to insertion. The internal inert tubing and sampling syringes are flushed with large volumes of ambient air between samples or discarded as required. If water, dirt, or any material is observed in the tubing, the tubing is discarded and replaced with fresh tubing.

11350 Monier Park Place, Rancho Cordova, CA 95742 Phone: (916) 853-8010 Fax: (916) 853-8020

teg

DTSC Protocols

Analytical Methodology

Soil vapor samples collected from each probe will be transferred directly to the on-site mobile laboratory and analyzed immediately. There will be minimal lag time between sample collection and analysis, ensuring that the integrity of the sample is maintained.

Samples will be analyzed on a gas chromatograph equipped with capillary columns and a combination of mass spectrometer (GC/MS), TCD, and FID detectors as needed. This combination of columns and detectors ensures compound separation, recognition, and detection at the required levels.

These detectors enable on-site analysis for petroleum hydrocarbons, volatile aromatics (BTEX), and volatile organic compounds (e.g. DCE, TCE, PCE, vinyl chloride) using EPA approved analytical methodology outlined in methods 8260B and 8015m. Output signals from each detector are processed by computer chromatography software and the results entered into a laboratory computer for on-site processing.

Daily instrument Calibration

Daily continuing calibration is performed at the start of each day by injecting and analyzing a mid-range calibration standard. Acceptable continuing calibration agreement: +/- 15% to 25% to the calibration curve, depending on the compound.

Blanks & Duplicates

Blanks are analyzed at the start of each day and more often as appropriate depending upon the measured concentrations. Typically, when high sample values are encountered, additional blanks may be analyzed. Duplicate samples are analyzed as needed or as requested by the client or regulatory agency.

Compound Confirmation

A MS (mass spectrometer) detector is used for absolute compound identification of VOCs. Also, a surrogate compound is added to each sample during analysis to confirm that the chromatographic retention times have not shifted during the course of the day and that surrogate recovery is adequate showing proper instrument operation and integrity.

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APPENDIX B

QA/QC CHECKLIST FOR REVIEW OF LABORATORY REPORT

QUALITY CONTROL CHECKLIST
FOR REVIEW OF LABORATORY REPORT

Job No.:	Y0323-04	**Site:**	751-785 7th Street, Oakland
Laboratory:	TEG	**Laboratory Report No.:**	
Report Date:		**BASELINE Reviewer:**	

	Yes	No	NA
GENERAL QUESTIONS **(Describe "no" responses below in "comments" section. Contact the laboratory, as required, for further explanation or action on "no" responses; document discussion in comments section.)**			
1a. Does the report include a case narrative? *(A case narrative MUST be prepared by the lab for all analytical work requested by BASELINE)*			
1b. Is the number of pages for the lab report as indicated on the case narrative/lab transmittal consistent with the number of pages that are included in report?			
1c. Does the case narrative indicate which samples were analyzed by a subcontractor and the subcontractor's name?			
1d. Does the case narrative summarize subsequent requests not shown on the chain-of-custody (e.g., additional analyses requested, release of "hold" samples)?			
1e. Does the case narrative explain why requested analyses could not be performed by laboratory (e.g., insufficient sample)?			
1f. Does the case narrative explain all problems with the QA/QC data as identified in the checklist (as applicable)?			
2a. Is the laboratory report format consistent and legible throughout the report?			
2b. Are the sample and reported dates shown in the laboratory report correct?			
3a. Does the lab report include a copy of the original chain-of-custody form?			
3b. Were all samples appropriately analyzed as requested on the chain-of-custody form?			
4. Was the lab report signed and dated as being reviewed by the laboratory director, QA manager, or other appropriate personnel? (Some lab reports have signature spaces for each page). (This requirement also applies to any analyses subcontracted out by the laboratory)			
5a. Are preparation methods, cleanup methods (if applicable), and laboratory methods indicated for all analyses?			
5b. If additional analytes were requested as part of the reporting of the data for an analytical method, were these included in the lab report?			
6. Are the units in the lab report provided for each analysis consistent throughout the report?			
7. Are the detection limits (DL) appropriate based on the intended use of the data (e.g., DL below applicable MCLs for water quality issues)?			

Quality Control Checklist *- continued*

	Yes	No	NA
8a. Are detection limits appropriate based on the analysis performed (i.e., not elevated due to dilution effects)?			
8b. If no, is an explanation provided by the laboratory?			
9a. Were the samples analyzed within the appropriate holding time (generally 2 weeks for volatiles, and up to 6 months for total metals)?			
9b. If no, was it flagged in the report?			
10. If samples were composited prior to analysis, does the lab report indicate which samples were composited for each analysis?			
11a. Do the chromatograms confirm quantitative laboratory results (petroleum hydrocarbons)?			
11b. Is a standard chromatogram(s) included in the laboratory report?			
11c. Do the chromatograms confirm laboratory notes, if present (e.g., sample exhibits lighter hydrocarbon than standard)?			
12. Are the results consistent with previous analytical results from the site? *(If no, contact the lab and request review/reanalysis of data, as appropriate.)*			
13a. REVISED LAB REPORTS ONLY. Is the revised lab report or revised pages to a lab report signed and dated as being reviewed by the laboratory director, QA manager, or other appropriate personnel?			
13b. REVISED LAB REPORTS ONLY. Does the case narrative indicate the date of revision and provide an explanation for the revision?			
13c. REVISED LAB REPORTS ONLY. Does the revised lab report adequately address the problem(s) that triggered the need for a revision?			
13d. REVISED LAB REPORTS ONLY. Are the data included in the revised report the same as the data reported in the original report, except where the report was revised to correct incorrectly reported data?			
QA/QC Questions Field/Laboratory Quality Control - Groundwater Analyses			
14. Are field blanks reported as "ND" (groundwater samples)? *A field blank is a sample of DI water that is prepared in the field using the same collection and handling procedures as the other samples collected, and used to demonstrate that the sampling procedure has not contaminated the sample.*			
14a. Are rinsate blanks reported as "ND" (soil samples)? *A rinsate blank is a sample of DI water that is prepared in the field by collecting DI rinse water after it has been poured over decontaminated sampling equipment. The rinsate blank is collected to demonstrate that the decontamination procedure has removed all the contaminants from the sampling equipment and that the sampling equipment has not contaminated the sample.*			

Quality Control Checklist *- continued*

	Yes	No	NA
15. Are trip blanks reported as "ND" (groundwater samples/volatile analyses)? *A trip blank is a sample of contaminant free matrix placed in an appropriate container by the lab and transported with the field samples collected. Provides information regarding positive interference introduced during sample transport, storage, preservation, and analysis. The sample is NOT opened in the field.*			
16. Are duplicate sample results consistent with the original sample (groundwater samples)? *Field duplicates consist of two independent samples collected at the same sampling location during a single sampling event. Used to evaluate precision of the analytical data and sampling technique. (Differences between the duplicate and sample results may also be attributed to environmental variability.)*			
Batch Quality Control (Samples are batched together by matrix [soil, water] and analyses requested. A batch generally consists of 20 or fewer samples of the same matrix type, and is prepared using the same reagents, standards, procedures, and time frame as the samples. QC samples are run with each batch to assess performance of the entire measurement process.)			
17. Do the sample batch numbers and corresponding laboratory QA/QC batch numbers match?			
18a. Are method blanks (MB) for the analytical method(s) below the laboratory reporting limits? *Used to assess lab contamination and prevent false positive results.*			
18b. If no, is an explanation provided in the case narrative to validate the data?			
18c. Are analytes that may be considered laboratory contaminants reported below the laboratory reporting limit? *Common lab contaminants include acetone, methylene chloride, diethylhexyl phthalate, and di-n-octyl phthalate.*			
18d. If no, was the laboratory contacted to determine whether the reported analyte could be a potential laboratory contaminant and was an explanation included in the case narrative?			
19. Are laboratory control samples (LCS) and LCS duplicate (LCSD) [a.k.a., Blank Spike (BS) and BS duplicates (BSD)] within laboratory reporting limits? Limits should be provided on the report. *LCS is a reagent blank spike with a representative selection of target analyte(s) and prepared in the same manner as the samples analyzed. The LCS should be spiked with the same analytes as the matrix spike (below). The LCS is free from interferences from the sample matrix and demonstrates the ability of the lab instruments to recover the target analytes. Accuracy (recovery information) is generally reported as % spike recovery; precision (reproducibility of results) between the LCS and LCSD is generally reported as the relative percent difference (RPD). LCS/LCSD can be run in addition to or in lieu of matrix QC data.*			
20a. Are the Matrix QC data (i.e., MS/MSD) within laboratory limits? Limits should be provided on the lab report. *The lab selects a sample from the batch and analyzes a spike and a spike duplicate of that sample. Matrix QC data is used to obtain precision and accuracy information and is reported in the same manner as LCS/LCSD. If the MS/MSD fails, the results may still be considered valid if the MB and either the LCS/LCSD or BS/BSD is within the lab's limits (failure is probably due to matrix interference).*			

Quality Control Checklist *- continued*

	Yes	No	NA
20b. If no, is the MB and either LCS/LCSD or BS/BSD within lab limits to validate the data?			
Sample Quality Control			
21a. Are the surrogate spikes reported within the lab's acceptable recovery limits? *A surrogate is a non-target analyte, which is similar in chemical structure to the analyte(s) being analyzed for, and which is not commonly found in environmental samples. A known concentration of the surrogate is spiked into the sample or QA "sample" prior to extraction or sample preparation. Results are usually reported as % recovery of the spike. Failure to meet lab's limits for primary and secondary surrogates results in rebatching and reanalysis of the sample; failure of only the primary or the secondary surrogate may be acceptable under certain circumstances. Failure generally is due to coelution with the sample matrix.*			
21b. If no, is an explanation given in the case narrative to validate the data?			

Comments:

_____

_____

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APPENDIX C

DAILY FIELD LOG, SAMPLE LABEL, AND CHAIN-OF-CUSTODY FORM

FIELD LOG page of

Project name:	751-785 7th Street, Oakland	**Project no.:**	Y0323-04
Logger:		**Date:**	
Weather conditions:			
Site personnel:			

Time	Field Activities
	Arrival Time
	Departure Time

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Example Sample Label

Project No: _____

SAMPLE ID: _____

Project Name: _____ **Date:** _____

Collected by: _____ **Time:** _____

Analyze for: _____

_____

_____

BASELINE 5900 Hollis Street, Suite D • Emeryville, CA 94608 • (510) 420-8686

BASELINE Environmental Consulting

CHAIN OF CUSTODY RECORD

5900 Hollis Street, Suite D
Emeryville, CA 94608
Tel: (510) 420-8686 Fax: (510) 420-1707

Turn-Around-Time _____
Laboratory _____
BASELINE Contact Person James McCarty

Project Number Y8359-09
Project Name: 711 71st Ave, Oakland CA

Samplers Signature

Sample ID No. Station	Date	Time	Media	Containers Type No.	Stainless Steel	Brass liner	Macrocore	Syringe	Presv. Ice		VOC's (EPA 8260)												
SG-01@5			GAS	1				X			X												
SG-01@10			GAS	1				X			X												
SG-02@5			GAS	1				X			X												
SG-02@10			GAS	1				X			X												
SG-03@5			GAS	1				X			X												
SG-03@10			GAS	1				X			X												
SG-04@5			GAS	1				X			X												
SG-04@10			GAS	1				X			X												
SG-05@5			GAS	1				X			X												
SG-05@10			GAS	1				X			X												
SG-06@50.0-0.5			GAS	1				X			X												
SG-06@100.0-0.5			GAS	1				X			X												
SG-07@51.5-2.0			GAS	1				X			X												
SG-07@10			GAS	1				X			X												
SG-08@5			GAS	1				X			X												
SG-08@10			GAS	1				X			X												

Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time	Remarks:

APPENDIX D

SITE-SPECIFIC HEALTH AND SAFETY PLAN

SITE HEALTH AND SAFETY PLAN

PROJECT/CLIENT INFORMATION

Project No:	Project Manager:	Site Health and Safety Manager:	Field Activities Date:
Y0323-04	James McCarty	William Scott	July 2011

Client: Brush Street Group 1155 3rd Street, No. 230 Oakland, CA 94607 Contact Person: Tom McCoy x206 Phone: (510) 286-8200	Site Address: 751-785 Seventh Street Oakland, CA Subcontractor: TEG

PROJECT DESCRIPTION:
TEG Northern California Inc. of Rancho Cordova, under the direction of BASELINE, will advance 16 shallow soil borings using a direct push technique for collecting soil gas samples. Soil gas samples will be collected by advancing a probe to the target depth; 5 or 10 ft below ground surface (bgs). After the probes have been driven to the target sample depth and the outer rod will be pulled back to expose the inlet to the soil gas probe. Hydrated bentonite will be used to seal around the drive rod at the surface to prevent ambient air intrusion from occurring. The soil gas will be collected using calibrated glass syringes and analyzed on-site using a mobile California-certified analytical laboratory operated by TEG. The soil gas samples will be analyzed for VOCs, in accordance with EPA Method 8260B by TEG mobile lab.

SITE HISTORY: The site has been used as a plating facility from about 1957 to 1998. Hazardous materials storage and use has been associated with this past land. Soils underlying the site contained elevated levels of chromium, copper, lead, nickel, and zinc; polycyclic aromatic hydrocarbons (PAHs), petroleum hydrocarbons as diesel, and VOCs (primarily trichloroethylene).

TRAINING REQUIREMENTS: Yane Nordhav, P.G., is the Principal-in-Charge. James McCarty is the Project Manager. Other BASELINE personnel include: William Scott, P.G., C.E.G., Field Geologist. TEG is a subcontractor to BASELINE Environmental, and will work under the direction of BASELINE personnel.

Responsibilities of BASELINE personnel include the following: James McCarty is the Project Manager and Yane Nordhav is the Principal-in-Charge. The project manager or principal-in-charge shall be: 1) present by telephone at all times during on-site work; 2) have overall responsibility for preparation, implementation, and modifications to this Plan; and 3) designate a BASELINE Site Health and Safety Officer to carry out the requirements of this Plan during all sampling activities. The responsibilities of William Scott, the designated BASELINE Site Health and Safety Officer/Project Supervisor, include: 1) being present at all times during on-site work; 2) enforcing this Site Health and Safety Plan (including the Emergency Response Plan, below); 3) stopping field operations if personnel safety and health may be jeopardized; 4) requesting site evacuation, if necessary; 5) designating other qualified personnel to work under the direction of Site Health and Safety Officer, as necessary, for purposes of implementing this Plan; and 6) overseeing completion of the sampling activities as described above, and supervising the work of subconsultants.

All on-site workers, including subcontractors and regulatory agency personnel, entering into the contamination reduction (warm), exclusion (hot), or any other areas of the site with potential or suspected contamination must be 40-hour trained in accordance with the federal and state OSHA HAZWOPER standard (including 3 days of supervised field experience and annual refresher training). All visitors entering the contamination reduction or

exclusion area or other areas of the site with potential or suspected contamination must at a minimum have 24-hour HAZWOPER training. The Site Health and Safety Manager will inquire whether each visitor is trained.

A copy of this site-specific Health and Safety Plan will be provided at the site and will be reviewed by the Site Health and Safety Manager prior to the start of work at the site, as part of a tailgate safety meeting. This site-specific Plan applies to all BASELINE employees engaged in hazardous materials activities on-site. This Plan, or an equally protective Plan, shall be adopted by the subcontractors as a supplement to their existing health and safety programs. All on-site personnel will be asked to sign a consent form included in this Plan, prior to each day of field activities, indicating that they have read the Plan, have participated in the tailgate safety meeting, meet the training requirements, and agree to all Plan conditions.

This Site Health and Safety Plan is intended to act as an extension of BASELINE's in-house Health and Safety Program including a Medical Surveillance Program, Hazard Communication Program, Hearing Conservation Program, Respiratory Protection Program, Personal Protective Equipment Program, Injury and Illness Program, Emergency Action Plan, and Fire Prevention Plan. BASELINE employees receive initial and refresher training in these programs.

CHEMICAL HAZARDS

The following known/suspected chemical hazards identified below may potentially be encountered by site personnel during sampling or other on-site activities.

Chemical	Description	Health and Safety Standards	Persons Exposed** and Potential Routes of Exposure	Target Organs	Symptoms of Acute Exposure
Petroleum hydrocarbons	Combustible liquid, may contain carcinogenic middle distillates LEL=0.7% UEL=5.0% (diesel)	PEL = NA REL = NA IDLH = NA	Dermal, eyes, ingestion	Eyes, skin, respiratory system	Minor eye/skin irritation
Metals (lead, arsenic, chromium, and nickel are provided as examples)					
Lead	odorless solid LEL=NA UEL=NA	PEL = 0.05 mg/m^3 REL = 0.1 mg/m^3 IDLH = 100 mg/m^3	Inhalation, eyes, ingestion	Eyes, GI tract, central nervous system, kidneys, blood, gingival tissue	Weakness, insomnia, abdominal pain, constipation, anemia, tremor, eye irritation
Chromium	Metal, odorless solid LEL=NA UEL=NA	PEL = 0.5 mg/m^3 REL = 0.5 mg/m^3 IDLH = 250 mg/m^3	Inhalation, eyes, ingestion	Eyes, skin, respiratory system	Eye and skin irritation, lung changes
Copper	odorless solid d LEL=NA UEL=NA	PEL = 0.1 mg/m^3 TWA REL = 0.1 mg/m^3 TWA IDLH = 100 mg/m^3	Inhalation, skin and/or eye contact	Eyes, skin, respiratory system	Irritation eyes, upper respiratory system; metal fume fever: chills, muscle ache, nausea, fever, dry throat, cough, lassitude (weakness, exhaustion); metallic or sweet taste; discoloration skin, hair

Chemical	Description	Health and Safety Standards	Persons Exposed** and Potential Routes of Exposure	Target Organs	Symptoms of Acute Exposure
Nickel	Metal, odorless solid, carcinogen LEL=NA UEL=NA	PEL = 1mg/m^3 REL = 0.015 mg/m^3 IDLH = 10 mg/m^3	Inhalation, eyes ingestion, dermal	Nose, lung, skin	Skin allergy, lung irritation, coughing respiratory problems
Zinc	Metal, odorless solid, carcinogen LEL=NA UEL=NA	PEL = 15 mg/m^3 REL = 10 mg/m^3 IDLH = NA	Inhalation, ingestion, skin and/or eye contact	Eyes, skin, respiratory system	Irritation eyes, skin, upper respiratory system; cough
Polynuclear aromatic hydrocarbons					
Polynuclear aromatic hydrocarbon (aka coal tar pitch volatiles)	Carcinogen, reproductive toxin, combustible LEL=NA UEL=NA	PEL = 0.2 mg/m^3 REL = 0.1 mg/m^3 IDLH = 80 mg/m^3	Inhalation, eyes	Respiratory system, skin, bladder, kidneys	Dermatitis, bronchitis
Naphthalene (polynuclear aromatic hydrocarbon)	Colorless to brown solid with a moth-ball odor, combustible LEL= 0.9% UEL=5.9%	PEL = 10 ppm REL = 10 ppm IDLH = 250 ppm	Inhalation, dermal, eyes, ingestion	Eyes, skin, blood, liver, kidneys, central nervous system	Eye irritation, headache, confusion, malaise, profuse sweating, dermatitis, blood in the urine, jaundice, bladder irritation
Volatile organic compounds					
Trichloroethyene (TCE)	Colorless liquid with a chloroform-like odor, solvent, carcinogen	PEL = 25 ppm TWA REL = 100 ppm TWA IDLH = 1000 ppm	Inhalation, skin absorption, ingestion, skin and/or eye contact	Eyes, skin, respiratory system, heart, liver, kidneys, central nervous system.	Eye and skin irritation, headache, vertigo, visual problems, fatigue, giddiness, tremor, nausea, vomiting, dermatitis, heart problems
1,2-dichloroethene (1,2-DCE)	Solvent	PEL = 350 ppm TWA REL = 200 ppm TWA IDLH = 1000 ppm	Inhalation, ingestion, skin and/or eye contact	Eyes, respiratory system, central nervous system.	Irritation eyes, respiratory system; central nervous system depression.
Vinyl Chloride	Solvent	PEL = 1 ppm TWA REL = LFC IDLH = 1000 ppm	Inhalation, skin and/or eye contact (liquid)	Liver, central nervous system, blood, respiratory system, lymphatic system	lassitude (weakness, exhaustion); abdominal pain, gastrointestinal bleeding; enlarged liver; pallor or cyanosis of extremities; liquid: frostbite; [potential occupational carcinogen]

Notes:
ppm = parts per million
PEL = Permissible exposure limit. Time-weighted average concentrations for a normal 8-hour work period for a 40-hour work week;
REL = Recommended exposure limit. Time-weighted average concentrations for up to a 10-hour day during a 40-hour work week.
IDLH = Immediately dangerous to life and health; a condition from which one cannot escape within 30 minutes without permanent damage or death.

LFC = Lowest feasible concentration.
UEL = Upper explosive limit.
LEL = Lower explosive limit.
NA = Not available or not applicable.

PHYSICAL HAZARDS:

Fire and explosion, heavy equipment, traffic, heat or cold stress, noise, aboveground and underground utilities, and tripping and falling hazards. Traffic control will be provided by BASELINE personnel. BASELINE employees will follow standard operating procedures (SOPs) for sampling and quality assurance/control, as found in BASELINE's Quality Assurance Program Plan.

Heavy equipment safety requirements are the responsibility of the operator. The contractor shall be responsible for complying with all OSHA requirements and accepted industry practices for protection of employee health and safety. The contractors shall ensure that all equipment is in good working order prior to starting work and shall ensure that proper housekeeping is maintained around the work area at all times.

BASELINE employees, subcontractors, and other personnel shall observe the following precautions:
1) Watch for slippery ground;
2) Keep safe distance from side of excavation;
3) Keep out of the path of the drill rig while moving;
4) Wear required personal protective equipment (PPE) at all times (see below);
5) Prevent strain injuries by using small sampling shipping containers and/or material handling aids.;
6) Avoid heat/cold stress by taking regular work breaks, liquids intake, and appropriate attire, as needed; and

PERSONAL PROTECTIVE EQUIPMENT REQUIRED: The rationale for selection of the PPE is based on the known and/or suspected hazardous materials at the site, the anticipated amount of contact with potentially contaminated materials as part of site-specific tasks, and PPE performance characteristics. On-site workers must be trained, as provided by their employer, in PPE use and care. All PPE must be properly maintained and stored to ensure it is in good working condition at the time of use. All PPE must be inspected prior to and following use.

Potential chemical hazards consist primarily of dermal contact with contaminated materials during sampling events. The risk of inhalation and ingestion of hazardous materials is negligible since sampling will occur insitu and personal hygiene measures will minimize dermal contact. Hard hats, nitrile gloves, safety glasses, steel toed footwear, water supply for washing, decontamination, and for drinking, first aid-kit, noise protection (ear plugs), traffic safety vests, and fire extinguisher (to be provided by contractor).

SITE CONTROL MEASURES: The site is surrounded by a chain link fence. There are two gates, one on 7th Street and one on Brush Street. The 7th Street gate will remain closed during the field work. The Site Health and Safety Officer will define and demarcate exclusion, decontamination, and clean zones for each activity; the need for multiple exclusion/decontamination zones will be determined in the field. The Site Health and Safety Officer will control access onto the site.

No eating or drinking shall be permitted in the exclusion zone; workers may go through partial decontamination (wash gloves, hands, and arms) to consume fluids in the warm zone. Avoid skin and eye contact with soil to the maximum extent possible.

DECONTAMINATION PROCEDURES (PERSONAL AND EQUIPMENT): Decontaminate with Alconox wash any sampling equipment that will be reused between boring locations. Antiseptic towelettes may also be

used for cleaning hands, arms, and face. All personnel should shower as soon as possible after leaving the site. Decontamination procedures shall be monitored by the Site Health and Safety Manager to determine their effectiveness. If decontamination procedures are found to be ineffective, the Site Health and Safety Manager should take appropriate action to immediately correct any deficiencies.

OTHER: The location of the nearest restroom will be identified by the Site Health and Safety Manager prior to sampling during the daily tailgate safety meeting. Drinking water and antiseptic towelettes will be provided by BASELINE for personal hygiene.

On-site personnel shall avoid heat/cold stress by taking regular work breaks, monitoring sufficient liquids intake, and wearing appropriate attire, if needed.

Any deficiencies in this Site Health and Safety Plan, identified by the Site Health and Safety Manager, shall be immediately corrected. On-site workers, identifying any deficiencies in this Plan, shall immediately notify the Site Health and Safety Manager of such deficiencies.

EMERGENCY PROCEDURES: A cellular phone is carried by BASELINE personnel. In the event of a major emergency (e.g., fire, major spill, medical, explosion), the Site Health and Safety Manager or his designee shall use the cellular phone to contact "911," James McCarty/Yane Nordhav (510 420-8686), the client (phone number listed above), and other emergency numbers listed below, as applicable. The designated BASELINE Site Health and Safety Manager shall verbally request evacuation of site personnel (personnel must first go through decontamination prior to evacuation).

In the event of a minor (incidental) release of a hazardous material, the spill will be immediately cleaned up by on-site BASELINE personnel, and spill cleanup materials placed in labeled drums. Salvage drums and absorbent materials (i.e., bentonite) shall be provided by drilling contractors. In the event of a larger than incidental (major) spill of hazardous materials, follow emergency procedures below.

Evacuation shall be requested by repeatedly honking the horn of a vehicle for personnel who are not within voice range. The honking will continue until personnel can be verbally notified of the emergency and the need for evacuation. Personnel shall evacuate the site to the reassembly area. The Site Health and Safety officer will be responsible for notifying personnel and any visitors of an appropriate evacuation route and reassembly area prior to the fieldwork during the tailgate safety meeting. The notification of the evacuation route and reassembly area will be made during the daily tailgate safety meeting and should be documented in the field log. An evacuation route and reassembly area are therefore not included herein. Any injured personnel shall be brought to the decontamination area prior to evacuation, and shall be assisted in decontamination, according to the procedures above, unless the transport or decontamination may cause further injury, where transport and decontamination shall be requested by the paramedics. The designated Site Health and Safety Manager shall account for all on-site personnel following evacuation.

Rescue and medical duties (other than first aid/CPR by trained personnel), as required, shall be provided by off-site emergency responders (e.g., paramedics, fire fighters). Injured personnel may only be transported to the Hospital Emergency Room if the injury is non-threatening and does not require immediate attention (e.g., scrapes, minor cuts). The hospital emergency route is included.

Following evacuation, the designated BASELINE Health and Safety Manager, shall request on-site personnel to maintain security of the site (by preventing unauthorized entry) until the site has been released to off-site emergency responders (fire fighters, police, etc.). Evacuated personnel will direct emergency responders to the emergency and inform them of site hazards and the emergency. Other emergency notifications may be required,

for example, the Emergency Management System (911), the Office of Emergency Services (800 852-7550), Oakland Fire Department, Hazardous Materials Management Program (510 238-3938), and U.S. Environmental Protection Agency, Region IX (415 744-2000). The need for emergency notifications will be determined by the designated BASELINE Health and Safety Manager and Project Manager(s), based on the emergency at hand. All notifications will be documented.

Following the emergency, the designated Site Health and Safety Officer shall be responsible for preparing a post-incident critique, for the purpose of identifying the cause of the emergency, response initiated, and need for additional training, procedures, or equipment. The designated Site Health and Safety Manager and Project Manager(s) shall take corrective action to prevent reoccurrence of the emergency. At any time if any deficiencies in these Emergency Procedures are identified, they shall be immediately corrected by the Site Health and Safety Manager. On-site workers identifying any deficiencies in the emergency procedures shall immediately notify the Site Health and Safety Manager of such deficiencies.

Prepared by:	Date:	Reviewed/Approved by:	Date:
James McCarty, P.E.	5/10/11		

Read by: /Date:

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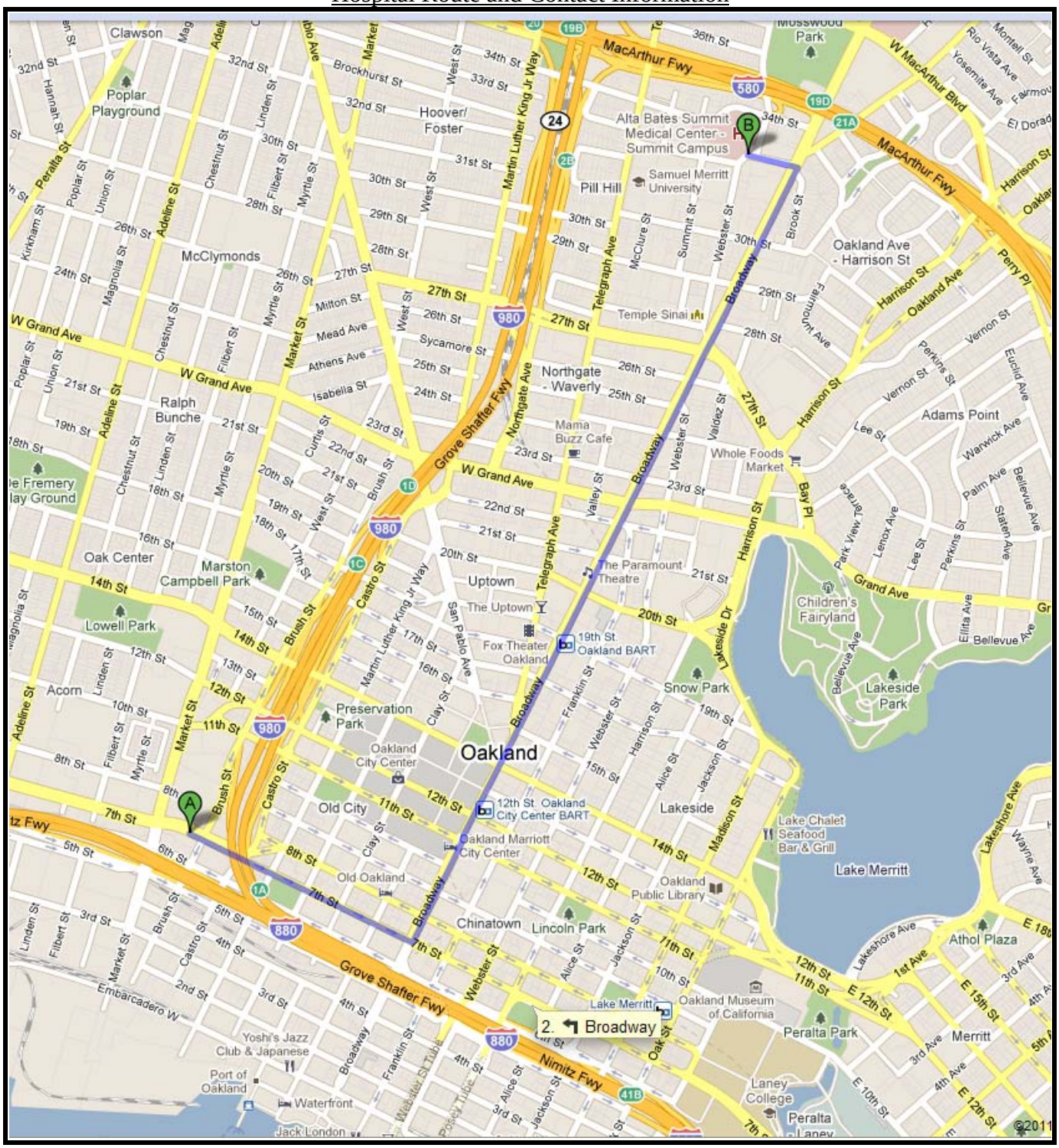
Hospital Route and Contact Information



Hospital/Clinic Name and Address:	Hospital Phone:	Paramedic/Fire & Police Dept.
Summit Medical Center, Emergency Room 350 Hawthorne Avenue, Oakland, CA	(510) 655-4000	Phone: 911

From site proceed southward on 7th Street to Broadway, turn left onto Broadway, follow Broadway to 30th Street, turn left on 30th Street, then right onto Webster Street. At the end of Webster is Hawthorne Ave. Emergency Room is on left.