PSAI REALTY PARTNERS

COMMERCIAL REAL ESTATE

February 3, 2017

Mr. Keith Nowell, P.G., C.H.G.
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: *Remedial Action Plan*, 1708 Wood Street, Oakland, California (Case No.: RO0003206).

Dear Mr. Nowell:

Please find attached the *Remedial Action Plan* prepared by West Environmental Services & Technology, Inc. (WEST) for the 1708 Wood Street property in Oakland, California (the "Site"). 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.

Please call me at 415-362-1700 if you have any questions, or wish to discuss this further.

Sincerely,

Martin Ward
Asset Manager

155 Montgomery Street ◆ Suite 1600
San Francisco, California 94104
Tel.: 415.362.1700 ◆ Fax: 415.362.1760

REMEDIAL ACTION PLAN
1708 Wood Street
Oakland, California
Case No.: RO3206

February 2017

Prepared for

PSAI Realty Partners
155 Montgomery Street, Suite 1600
San Francisco, CA 94104

Prepared by

WEST
Environmental Services & Technology
711 Grand Avenue, Suite 220
San Rafael, California 94901
415/460-6770 Fax 415/460-6771
main@westenvironmental.com

TABLE OF CONTENTS

SECTION **PAGE**

1.0 INTRODUCTION....1

2.0 BACKGROUND....2

2.1 SITE DESCRIPTION AND HISTORICAL USE....2
2.2 SITE DEVELOPMENT....2
2.3 GEOLOGIC AND HYDROGEOLOGIC SETTING....3
2.4 SUMMARY OF INVESTIGATIONS....4
2.4.1 Area 1 – Northwest UST Area....4
2.4.2 Area 2-Central Eastern UST and Oil-Water Separator Area....5
2.4.3 Loading Dock Building....7
2.4.4 Eastern Side of Subject Property....8
2.5 SUMMARY....9

3.0 DATA EVALUATION....10

3.1 CONCEPTUAL SITE MODEL....10
3.2 SCREENING LEVEL ASSESSMENT....11
3.2.1 Exposure Pathways Evaluation....11
3.2.2 Identification of Screening Levels....12
3.3 COMPARATIVE ANALYSIS....14
3.3.1 Area 1-Northwest UST Area....14
3.3.2 Area 2-Central Eastern UST and Oil-Water Separator Area....15
3.3.3 Loading Dock Building....16
3.3.4 Eastern Side of Subject Property....17
3.4 DATA GAP ANALYSIS....18

4.0 EVALUATION OF REMEDIAL TECHNOLOGIES....20

4.1 EXCAVATION....20
4.2 ENGINEERING CONTROLS....20
4.3 INSTITUTIONAL CONTROLS....21
4.4 PREFERRED REMEDIAL ACTION....21

5.0 REMEDIAL ACTION IMPLEMENTATION....23

5.1 TASK 1: SUPPLEMENTAL VAPOR SAMPLING....24
5.1.1 Sample Probe Installation....24
5.1.2 Sample Collection....24
5.2 TASK 2: SOIL EXCAVATION AND REUSE....25
5.2.1 Permitting and Utility Clearance....25
5.2.2 Worker Health and Safety....26
5.2.3 Site Preparation....26
5.2.4 Soil Excavation....26
5.2.5 Soil Handling....27
5.2.6 Geotextile Placement....29
5.2.7 Groundwater Management....29
5.2.8 Backfilling....29
5.2.9 Soil Stockpile Management....30
5.2.10 Soil Disposal....30

TABLE OF CONTENTS

SECTION **PAGE**

5.3 TASK 3: METHANE MITIGATION SYSTEM 32
5.3.1 Dispersion Vent Layer *33*
5.3.2 Vapor Barrier *33*
5.3.3 Foundation Seals *35*
5.3.4 Utility Trench Vapor Dams *35*
5.3.5 Post-Construction Monitoring *36*
5.4 TASK 4: UTILITY TRENCH DAMS 36
5.5 TASK 5: RESIDUAL RISK MANAGEMENT PLAN 36
5.6 TASK 6: LAND USE COVENANT 36
5.7 TASK 7: COMPLETION REPORT 37

6.0 REFERENCES 39

7.0 DISTRIBUTION LIST 40

TABLES

FIGURES

APPENDICES

LIST OF TABLES

Table 2-1 Summary of Soil Analytical Results-TPH and VOCs

Table 2-2 Summary of Soil Analytical Results-PAHs

Table 2-3 Summary of Soil Analytical Results-Metals

Table 2-4 Summary of Soil Gas Analytical Results

Table 2-5 Summary of Shallow Groundwater Analytical Results-TPH, VOCs, Chloride and PCBs

Table 2-6 Summary of Shallow Groundwater Analytical Results-PAHs

Table 2-7 Summary of Shallow Groundwater Analytical Results-Metals

Table 2-8 Summary of Shallow Groundwater Analytical Results-TPH and VOCs

LIST OF FIGURES

Figure 1-1 Site Location Map

Figure 2-1 Site Plan

Figure 2-2 Geologic Cross-Section A-A'

Figure 2-3 Geologic Cross-Section B-B'

Figure 2-4 Geologic Cross-Section C-C'

Figure 3-1 Conceptual Site Model

Figure 3-2 Sample Location Map over Proposed Site Development

Figure 3-3 Area 1-Northwest UST Basin-Proposed Site Development

Figure 3-4 Area 2-Central UST Basin

Figure 5-1 Proposed Remedial Action Areas

Figure 5-2 Conceptual Vapor System Design Details

LIST OF APPENDICES

Appendix A Development Plans

Appendix B Summary of Historical RECs

Appendix C Soil Gas Field Data Forms and Laboratory Data Certificates

Appendix D Calculations

Appendix E Specifications

SIGNATURE PAGE

All information, conclusions and recommendations contained in this report have been prepared under the supervision of the undersigned professional(s).

Peter M. Krasnoff
California Registered Civil Engineer (44031)

REGISTERED PROFESSIONAL ENGINEER
PETER KRASNOFF
C44031
EXP. 6/30/17
CIVIL
STATE OF CALIFORNIA

2/8/17
Date

Peter E. Morris
California Professional Geologist (7084)

PROFESSIONAL GEOLOGIST
PETER E. MORRIS
7084
Exp. 4/30/17
STATE OF CALIFORNIA

2/8/17
Date

1.0 INTRODUCTION

This *Remedial Action Plan* ("*RAP*") has been prepared by West Environmental Services & Technology, Inc., (WEST), on behalf of PSAI Realty Partners (PSAI), for the 1708 Wood Street property located in Oakland, California ("Site;" Figure 1-1). The Site is to be redeveloped for multi-family residential use, with multi-story townhomes, landscape areas and hardscapes. This *RAP* presents the proposed remedial actions to address total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs) and lead in soil, methane in soil gas and petroleum hydrocarbons in shallow groundwater at the Site. The *RAP* includes: a summary of the Site investigations; data evaluation and data gap analysis; evaluation of remedial technologies; and details of the recommended remedial action implementation. The data gap analysis identified additional investigations are needed to further characterize the presence of methane in the subsurface.

The recommended remedial action includes: excavation of soil containing TPHd, PAHs and lead above California Regional Water Quality Control Board-San Francisco Bay Region (Regional Water Board) Environmental Screening Levels (ESLs) in the upper 3-feet within the landscape areas for on-Site reuse as engineered fill; vapor mitigation to address methane in soil gas; preparation of a Residual Risk Management Plan (RRMP); and institutional controls (i.e., land use covenant). The extent of the methane vapor mitigation deployment will be determined based on the findings of the additional investigations. Implementation of the *RAP* is being overseen by the Alameda County Environmental Health (ACEH) under Case No.: RO0000039.

2.0 BACKGROUND

2.1 SITE DESCRIPTION AND HISTORICAL USE

The approximately 4.3-acre Site is located at 1708 Wood Street in Oakland, Alameda County, California within a mixed residential, commercial and industrial area (Figure 2-1). The Site is comprised of two adjoining parcels with Assessors' Parcel Numbers 7-562-1 and 7-563-1. Previously, the two parcels were separated by former Willow Street, which now terminates at 17th Street just south of the Site. Adjacent properties include Raimondi Park to the north, existing industrial businesses to the south, residences to the east, and the historical 16th Street Train Station (currently vacant) to the west.

The Site has been used for commercial and industrial purposes including automotive uses (California Motor Express/California Motor Transport Company, Circle Freight Lines, Stockton Motor Express General OFC, California Motor Express, Calko Transport Company, Inc., and Roadway Express) and industrial uses (roofing, furniture warehousing, and sheet metal and iron works). Currently, the Site is occupied by Three Rivers Trucking and is utilized as a trucking/shipping terminal and for surface parking. One trucking terminal building is currently located on the southwestern side of the Site. The surrounding area was historically and currently is used for railroad, industrial and residential housing.

2.2 SITE DEVELOPMENT

The Site will be developed with 128 multi-family residential and live/work townhome-style condominiums (Appendix A). The townhomes will be three-story, attached condominiums with private, at-grade garages. Some townhomes will also feature flexible workspaces at the ground level. The Site will feature a publicly accessible, midblock pedestrian connection joining Raimondi Park to Willow Street and the greater Prescott neighborhood beyond, and two vehicular access points (oriented to the Frontage Road and West Grand Avenue).

2.3 GEOLOGIC AND HYDROGEOLOGIC SETTING

The Site lies within the East Bay Plain Groundwater Basin Oakland sub-area. San Francisco Bay is located approximately one-mile to the west of the Site. Site geology is underlain by fill material and unconsolidated sediments comprised of Bay Mud, silts, clays and sands. The fill material was encountered in borings advanced at the Site with a thickness ranging to approximately 3-feet below ground surface on the eastern portion of the Site to approximately 6-feet below ground surface on the western portion of the Site (Figure 2-2). The fill material is comprised of clays and/or gravels containing debris. Bay Mud was encountered in the borings underlying the fill material within the eastern half of the Site. The Bay Mud is an approximately 5-foot to 10-foot thick peat layer with high organics content. On the western half of the Site, the fill material is underlain by unconsolidated silty and clayey sands that overlie Bay Mud (Figures 2-2 and 2-3). Underlying the Bay Mud are approximately 5-foot to 10-foot thick saturated silty sands to clayey sands that extend to a depth of approximately 15-feet to 30-feet below ground surface.

The Site hydrogeology is described as two distinct groundwater zones, identified as shallow and deep. The shallow zone is present to depth of approximately 10-feet below ground surface and has been observed as low yielding. The depth to groundwater measured within former monitoring wells constructed within the shallow zone has ranged between approximately 1-foot to 5-feet below ground surface. The groundwater flow direction in the shallow zone was calculated between the east and northeast with a predominantly downward vertical gradient (Grafcon, 2016).

The deep groundwater-bearing zone is confined with a calculated groundwater flow direction that varies from north-northwest to west-southwest. The upper and lower groundwater zones are separated by an approximately 5-foot to 10-foot-thick layer of Bay Mud.

2.4 SUMMARY OF INVESTIGATIONS

Site investigations have been conducted since the 1980s in four main areas: Area 1-Northwest UST Area; Area 2-Central and Eastern UST and Oil-Water Separator Area; Loading Dock Area; and Eastern Side of Subject Property. Details of the investigations were presented in Grafcon's November 21, 2016 *Environmental Site Summary*. A summary of the Site investigations is presented below, in Tables 2-1 to 2-8 and on Figures 2-1 to 2-4. A summary of the historical Site uses and investigation areas are included in Appendix B.

2.4.1 Area 1 – Northwest UST Area

Area 1 is located in the northwestern portion of the Site (Figure 2-1). Two historical underground storage tanks (USTs) (one with a capacity that apparently ranged between approximately 2,000 gallons and 8,000 gallons and another with a 10,000 gallon capacity, respectively) with unknown contents were identified in this area in May 1987. Due to structural concerns, the two USTs were emptied of contents and abandoned in place. In October 2011, the two USTs, product piping and vent piping were removed from a shored excavation with oversight from the ACEH and the City of Oakland Fire Department (Grafcon, 2016). The cleanup for this Northwestern UST Area was conducted under existing ACEH Case No.: RO0000039, previously assigned to Area 2 below.

Laboratory analysis of soil samples collected within Area 1 revealed total petroleum hydrocarbons as diesel (TPHd), polycyclic aromatic hydrocarbons (PAHs) and lead. TPHd was detected up to 5,930 milligrams per kilogram (mg/kg) (SW4-W at 3.5-feet below ground surface). PAHs were detected in the soil samples including: benzo(a)anthracene up to 0.300 mg/kg, benzo(a)pyrene (BaP) up to 0.270 mg/kg, benzo(b)fluoranthene up to 0.270 mg/kg and dibenz(a,h)anthracene up to 0.037 mg/kg (SB-1 at 2.5-3 feet below ground surface).

Groundwater samples collected from Area 1 detected petroleum constituents, including total petroleum hydrocarbons as gasoline (TPHg) up to 54,000 micrograms per liter (µg/l), TPHd up to

61,000 µg/l, TPH as motor oil (TPHmo) up to 2,600 µg/l and total oil and grease up to 430,000 µg/l. Volatile organic compounds (VOCs) were not detected in the groundwater samples; except for benzene up to 5 µg/l, toluene up to 111 µg/l; ethyl benzene up to 11 µg/l; and xylenes up to 62 µg/l.

Polychlorinated biphenyls were not detected in the groundwater samples collected from Area 1 above the laboratory-reporting limits. Chloride was also detected in groundwater up to 380,000 µg/l. The detected TPH concentrations appear associated with a surface sheen observed during UST removals and not dissolved concentrations, as the concentrations exceeded expected solubility for these chemicals. Metals were also detected in groundwater; however, appear associated with suspended sediments within the collected samples.

In December 2016, a soil gas sample (SG-2) was collected from within Area 1 near the former USTs (Figure 2-1). The soil gas sample was collected at approximately 1-foot below ground surface due to the shallow groundwater observed in the borehole at approximately 2-feet below ground surface. Laboratory analysis of the soil gas sample revealed: chloroethane at 68.8 micrograms per cubic meter (µg/m^3); trichlorofluoromethane at 14.9 µg/m^3; chloroform at 10.2 µg/m^3; benzene at 14.2 µg/m^3; toluene at 13.9 µg/m^3; and 1,2-4-trimethylbenzene at 22.5 µg/m3. Methane was also detected in the soil gas sample SG-2 at 30.1 parts per million by volume (ppmv). Copies of the field data forms, laboratory data certificates and chain-of-custody forms are included in Appendix C.

2.4.2 Area 2-Central Eastern UST and Oil-Water Separator Area

Area 2 is located in the central eastern portion of the Site along 18th Street and historically contained three USTs, including one 10,000-gallon gasoline UST, one 10,000-gallon diesel UST and one 6,000-gallon motor oil UST. The gasoline and motor oil USTs and associated piping were removed in 1987 (Grafcon, 2016). In April of 1996, the remaining 10,000-gallon diesel UST and all associated piping were removed. In addition to these three USTs, an oil-water separator was also located in Area 2. Multiple soil and groundwater investigations were

conducted between 1998 and 2011, which indicated the presence of petroleum constituents in soil and groundwater (predominately TPHd and total oil and grease). Soil and groundwater impacted with elevated concentrations of petroleum hydrocarbons were removed during tank removals conducted in 2011.

Laboratory analysis of the soil samples collected from Area 2 revealed petroleum hydrocarbons including: TPHg up to 0.3 mg/kg (SB-22 at 1-1.5 feet below ground surface); TPHd up to 370 mg/kg (SB-22 at 1-1.5 feet below ground surface); TPHmo up to 2,100 mg/kg ((SB-22 at 1-1.5 feet below ground surface); and total oil & grease up to 940 mg/kg (SB-12 at 2-2.5 feet below ground surface). VOCs were not detected in the soil samples above their respective laboratory-reporting limits. Lead was detected in the soil samples collected from within Area 2 up to 14,000 mg/kg (SB-21 at 1-1.5 feet below ground surface).

Laboratory analysis of groundwater samples collected from borings and monitoring wells within Area 2 revealed petroleum hydrocarbons including: TPHg up to 840 µg/l (B-7); TPHd up to 120,000 µg/l (B-7); and TPHmo up to 9,900 (BM-4). Based on review of results (as discussed in Area 1 above), it appears that elevated TPH concentrations were due to surface sheen or suspended sediment, and not dissolved concentrations (Grafcon, 2016). PAHs and metals were also detected in the groundwater samples; however, may have contained suspended sediment in the collected samples.

In December 2016, a soil gas sample (SG-3) was collected from within Area 2 near the former USTs and oil-water separator (Figure 2-1). The soil gas sample was collected at approximately 1-foot below ground surface due to the shallow groundwater observed in the borehole at approximately 2-feet below ground surface. Laboratory analysis of the soil gas sample revealed: chloroform at 13.7 $\mu g/m^3$; benzene at 15.1 $\mu g/m^3$; and toluene at 5.88 $\mu g/m^3$. Methane was also detected in the soil gas sample SG-3 at 32.6 ppmv. Copies of the field data forms, laboratory data certificates and chain-of-custody forms are included in Appendix C.

2.4.3 Loading Dock Building

Investigations conducted near the loading dock were related to releases reported in the Hazardous Material Incident Reporting System (HMIRS) and the California Hazardous Material Incident Reporting System (CHMIRS) databases (Grafcon, 2016). Laboratory analysis of soil samples collected near the loading dock building revealed petroleum hydrocarbons including: TPHd up to 2,700 mg/kg (SB-6 at 2-2.5 feet below ground surface) and TPHmo up to 9,200 mg/kg (SB-6 at 2-2.5 feet below ground surface). PAHs were also detected in the soil samples including: benz(a)anthracene up to 0.450 mg/kg (SB-8 at 1.5-2 feet below ground surface); BaP up to 0.35 mg/kg (SB-8 at 1.5-2 feet below ground surface); benzo(b)fluoranthene up to 0.450 mg/kg (SB-8 at 1.5-2 feet below ground surface); and dibenz(a,h)anthracene up to 0.017 mg/kg (SB-4 and SB-5 at 2-2.5 feet below ground surface). Metals were detected in the soil samples including lead up to 19 mg/kg.

Groundwater samples collected from the borings advanced near the loading dock building revealed petroleum hydrocarbons including TPHd up to 940 µg/l (SB-6) and TPHmo up to 690 µg/l (SB-6). VOCs were not detected in the groundwater samples collected near the loading dock building.

In December 2016, a soil gas sample (SG-4) was collected near the loading dock building (Figure 2-1). The soil gas sample was collected at approximately 1-foot below ground surface due to the shallow groundwater observed in the borehole at approximately 2-feet below ground surface. Laboratory analysis of the soil gas sample revealed VOCs including 1,3,5-trimethylbenzene at 202 $\mu g/m^3$ and 1,2,4-trimethylbenzene at 201 $\mu g/m^3$. Methane was also detected in the soil gas sample SG-4 at 212 ppmv. Copies of the field data forms, laboratory data certificates and chain-of-custody forms are included in Appendix C.

2.4.4 Eastern Side of Subject Property

The borings conducted on the eastern side of the Subject Property were related to the historical industrial uses of the Site including: roofing; furniture warehousing; sheet metal and iron works; and automotive uses (McKinley Perkins and California Motor Express). Laboratory analysis of soil samples collected within the eastern area revealed petroleum hydrocarbons including TPHd up to 290 mg/kg (SB-16 at 2-2.5 feet below ground surface) and TPHmo up to 2,200 mg/kg (SB-16 at 2-2.5 feet below ground surface). VOCs were not detected in the soil samples above their respective laboratory-reporting limits. PAHs were detected in the soil samples including: benzo(a)anthracene up to 0.750 mg/kg; BaP up to 1.0 mg/kg; benzo(b)fluoranthene up to 1.1 mg/kg; and dibenz(a,h)anthracene up to 0.100 mg/kg, in the sample collected from boring SB-15 at 2-2.5 feet below ground surface. Metals were detected in the soil samples including lead up to 2,100 mg/kg (SB-24 at 1-1.5 feet below ground surface).

Groundwater samples collected from the borings advanced within the eastern area revealed petroleum hydrocarbons including TPHd up to 3,100 µg/l (SB-18) and TPHmo up to 2,200 µg/l (SB-18). VOCs were not detected in the groundwater samples collected within the eastern area above their respective laboratory-reporting limits except for benzene up to 2.8 µg/l (SB-16) and tetrachloroethene up to 1.9 µg/l (SB-17).

In December 2016, a soil gas sample (SG-1) was collected from the eastern side of the Site (Figure 2-1). The soil gas sample was collected at approximately 1-foot below ground surface due to the shallow groundwater observed in the borehole at approximately 2-feet below ground surface. Laboratory analysis of the soil gas sample did not reveal VOCs above their respective laboratory-reporting limits. Methane was detected in the soil gas sample SG-1 at 134,000 ppmv. Copies of the field data forms, laboratory data certificates and chain-of-custody forms are included in Appendix C.

2.5 SUMMARY

Based on the investigations conducted at the Site, the contaminants of concern and associated media include:

- Soil: TPHd; lead; and PAHs including benzo(a)anthracene, B(a)P, benzo(b)fluoranthene and dibenz(a,h)anthracene; and

- Soil gas: Methane.

Although residual groundwater impacts are present across the Site, the USTs were closed by the by the ACEH in 2015 (ACEH, 2015) under a commercial use scenario. As part of the case closure, the ACEH, with concurrence from the California Regional Water Quality Control Board-San Francisco Bay Region (Regional Water Board) indicated that groundwater beneath the Site is not a current or potential drinking water source (ACEH, 2015).

3.0 DATA EVALUATION

Consistent with Regional Water Board guidance, a screening level assessment was performed to assist in assessing the adequacy of the existing data (Regional Water Board, 2016). The screening level assessment consisted of three components: (1) identification of potential exposure pathways; (2) identification of appropriate screening levels for each media; and (3) a comparative analysis. The screening level assessment has been used to evaluate conditions of potential concern and identify areas for additional investigations, i.e., data gaps.

3.1 CONCEPTUAL SITE MODEL

Pursuant to the DTSC guidance documents, a CSM has been prepared for the Site (CalEPA, 1999). The CSM represents the assemblage of the existing Site data and the general physical conditions that influence contaminant transport.

The CSM presents the primary and secondary sources of TPH, VOCs, PAHs and metals and their release mechanisms to soil, soil gas and/or groundwater. The CSM was developed based on: known historical operations at the Site; investigation results; properties of the chemicals present; suspected chemical release mechanisms; transport mechanisms; and potential exposure scenarios.

\A review of the findings indicates that the CSM supports the conclusion that on-Site contributions of TPH, PAHs and metals in soil are associated with the fill material, releases from the former USTs and historical operations. The presence of VOCs in soil gas is associated with the former USTs and historical industrial operations. Methane is associated with biogenic degradation of organic material found in the Bay Mud. The presence of TPH and VOCs in groundwater are associated with releases from the former USTs. Graphical depiction of the CSM is presented on Figure 3-1.

3.2 SCREENING LEVEL ASSESSMENT

3.2.1 Exposure Pathways Evaluation

Exposure pathways for TPH, PAHs and metals in soil, VOCs and methane in soil gas and TPH and VOCs in groundwater at the Site have been evaluated to assess the potential impacts to human health and the environment. Direct contact and ingestion of soil is identified as complete exposure pathway for future residents and construction and maintenance workers. Vapor intrusion of VOCs is identified as a potentially complete exposure pathway for future Site occupants. Direct exposure to VOCs in groundwater is not identified as a potentially complete exposure pathway as groundwater beneath the Site is not a current or potential drinking water source and the Site is served by municipal water supply.

3.2.1.1 EXPOSURE CONCENTRATIONS

Where sample data were limited, the maximum-detected concentration of the chemicals was compared with the screening levels. The USEPA recommends that maximum beneficial uses of a property be the basis for evaluation. Based on the development plans for at-grade multi-family residential units, landscaping and hardscape, the Site soil and soil gas conditions have been screened using the methods described below based on a residential and construction and maintenance workers exposure scenarios.

3.2.1.2 COMMERCIAL/INDUSTRIAL WORKER

The commercial/industrial scenario uses the conservative assumption that on-Site workers spend all or most their workday outdoors. The exposure for commercial/industrial workers is presumed to include: (1) a full time employee of a company operating on-site who spends most of the work day conducting maintenance or manual labor activities outdoors or (2) a worker who is assumed to regularly perform grounds-keeping activities as part of his/her daily responsibilities (Regional Water Board, 2016). Exposure to surface and shallow subsurface soils (i.e., at depths of zero- to

two-feet below ground surface) is expected to occur during excavation of foundations and subsurface utilities during Site construction and moderate digging associated with routine maintenance and grounds-keeping. The commercial/industrial worker scenario is based on a worker that is exposed to chemicals at the Site for 24-hours per day during 250-days per year for 25-years.

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As noted above, the commercial/industrial exposure scenario includes a worker who is assumed to regularly perform grounds-keeping activities as part of his/her daily responsibilities. Exposure to surface and shallow subsurface soils (i.e., at depths of zero to two feet below ground surface) is expected to occur during moderate digging associated with routine maintenance and grounds-keeping activities.

3.2.1.3 CONSTRUCTION WORKERS

Based on the anticipated development of the Site, the evaluation also included consideration of the potential exposure for construction workers. The construction worker exposure scenario is based on exposure to soil for the workday for a one-year construction project. If multiple construction projects are anticipated, it is expected that different workers will be employed for each project (Regional Water Board, 2016). The scenario includes substantial exposures to surface and subsurface soil via ingestion, dermal contact and inhalation of particulates.

3.2.2 Identification of Screening Levels

Based on the identified exposure pathways, screening levels were identified for chemicals in soil and soil gas. Groundwater screening levels were not identified as groundwater beneath the Site not considered a source of drinking water. Chemical-specific screening levels were developed from concentrations based on published environmental screening criteria. The screening levels that were considered include the Regional Water Board Environmental Screening Levels (ESLs). Exceeding a screening level "does not necessarily indicate that adverse impact to human health

or the environment are occurring, [it] simply indicates that potential for adverse impacts may exist and that additional evaluation is warranted" (Regional Water Board, 2016).

3.2.2.1 REGIONAL WATER BOARD ESLS

The Regional Water Board has identified ESLs for TPH, PAHs and metals in soil and VOCs in soil gas (Regional Water Board, 2016). The Regional Water Board ESLs "are intended to be conservative" and "the presence of a chemical at […] concentrations below the corresponding ESL can be assumed to not pose a significant threat to human health and the environment." While a chemical may be measured at concentrations above the Regional Water Board ESL, it "does not necessarily indicate adverse effects on human health or the environment are occurring, rather that additional evaluation is warranted." In developing the ESLs, the Regional Water Board has considered exposure pathways to humans, including inhalation of VOCs in indoor air from migration of contaminated soil gas.

3.2.2.2 CALEPA SCHOOL SITE GUIDANCE

The California Environmental Protection Agency's (CalEPA) Department of Toxic Substances Control (DTSC) has published advisories to assist in the evaluation of potential school sites. While not directly applicable to commercial developments, the advisories provide conservative screening criteria to aid in evaluating potential threats to human health and environment. Due to the presence of methane in soil gas beneath the Site, the screening level evaluation also considers the recommended action level for methane in soil gas of 5,000 ppmv (10-percent of the lower explosive limit) as presented in the 2005 CalEPA *Advisory on Methane Assessment and Common Remedies at School Sites*.

3.3 COMPARATIVE ANALYSIS

An evaluation between the identified screening levels and the soil laboratory analytical results was performed to characterize the Site conditions. The areas containing soil above screening levels are depicted on Figures 3-2 to 3-4.

3.3.1 Area 1-Northwest UST Area

3.3.1.1 TPH AND VOCS IN SOIL

TPH as gasoline was detected in soil up to 104 mg/kg (at 3.5-feet below ground surface), below the Regional Water Board residential screening level of 740 mg/kg. TPHd was detected up to 5,930 mg/kg (SW4-W at 3.5-feet below ground surface), above Regional Water Board residential screening level of 230 mg/kg. TPHmo was detected up to 1,140 mg/kg (at 3.5-feet below ground surface), below its Regional Water Board residential screening level of 11,000 mg/kg. VOCs were not detected in soil samples above their respective laboratory-reporting limits.

3.3.1.2 PAHS IN SOIL

Benzo(a)anthracene was detected in soil up to 0.300 mg/kg (SB-1 at 2.5-3 feet below ground surface), above the Regional Water Board residential screening level of 0.160 mg/kg. BaP was detected in soil up to 0.270 mg/kg (SB-1 at 2.5-3 feet below ground surface), above the Regional Water Board residential screening level of 0.016 mg/kg. Benzo(b)fluoranthene was detected in soil up to 0.270 mg/kg (SB-1 at 2.5-3 feet below ground surface), above the Regional Water Board residential screening level of 0.160 mg/kg. Dibenz(a,h)anthracene was detected in soil up to 0.037 mg/kg (SB-1 at 2.5-3 feet below ground surface), above the Regional Water Board residential screening level of 0.016 mg/kg. Other PAHs were detected in soil but concentrations below their respective Regional Water Board residential screening levels.

3.3.1.3 METALS IN SOIL

Arsenic was detected in soil up to 11 mg/kg (SB-1 at 2.5-3 feet below ground surface), which is consistent with the background arsenic concentrations up to 11 mg/kg for the San Francisco Bay Area (Duverge, 2011). Lead was detected up to 780 mg/kg, above Regional Water Board residential screening level of 80 mg/kg. Other metals were detected in the soil samples but at levels below their respective Regional Water Board ESLs.

3.3.1.4 VOCS IN SOIL GAS

VOCs were not detected in soil gas at concentrations above their respective Regional Water Board residential screening levels. Methane was detected in soil gas at 30.1 ppmv below its CalEPA action level of 5,000 ppmv.

3.3.2 Area 2-Central Eastern UST and Oil-Water Separator Area

3.3.2.1 TPH AND VOCS IN SOIL

TPH as gasoline was detected in soil up to 0.3 mg/kg (SB-22 at 1-1.5 feet below ground surface), below the Regional Water Board residential screening level of 740 mg/kg. TPHd was detected up to 370 mg/kg (SB-22 at 1-1.5 feet below ground surface), above Regional Water Board residential screening level of 230 mg/kg. TPHmo was detected up to 2,100 mg/kg (SB-22 at 1-1.5 feet below ground surface), below its Regional Water Board residential screening level of 11,000 mg/kg. VOCs were not detected in soil samples above their respective laboratory-reporting limits.

3.3.2.2 METALS IN SOIL

Arsenic was detected in soil up to 5.9 mg/kg (SB-12 at 2-2.5 feet below ground surface), which is consistent with the background arsenic concentrations up to 11 mg/kg for the San Francisco Bay Area (Duverge, 2011). Lead was detected up to 14,000 mg/kg (SB-21 at 1-1.5 feet below

ground surface), above Regional Water Board residential screening level of 80 mg/kg. Other metals were detected in the soil samples but at levels below their respective Regional Water Board ESLs.

3.3.2.3 VOCs IN SOIL GAS

VOCs were not detected in soil gas at concentrations above their respective Regional Water Board residential screening levels. Methane was detected in soil gas at 32.6 ppmv below its CalEPA action level of 5,000 ppmv.

3.3.3 Loading Dock Building

3.3.3.1 TPH AND VOCs IN SOIL

TPHd was detected up to 2,700 mg/kg (SB-6 at 2-2.5 feet below ground surface), above Regional Water Board residential screening level of 230 mg/kg. TPHmo was detected up to 9,200 mg/kg (SB-6 at 2-2.5 feet below ground surface), below its Regional Water Board residential screening level of 11,000 mg/kg. VOCs were not detected in soil samples above their respective laboratory-reporting limits.

3.3.3.2 PAHs IN SOIL

Benzo(a)anthracene was detected in soil up to 0.450 mg/kg (SB-8 at 1.5-2 feet below ground surface), above the Regional Water Board residential screening level of 0.160 mg/kg. BaP was detected in soil up to 0.350 mg/kg (SB-8 at 1.5-2 feet below ground surface), above the Regional Water Board residential screening level of 0.016 mg/kg. Benzo(b)fluoranthene was detected in soil up to 0.450 mg/kg (SB-8 at 1.5-2 feet below ground surface), above the Regional Water Board residential screening level of 0.160 mg/kg. Dibenz(a,h)anthracene was detected in soil up to 0.017 mg/kg (SB-4 and SB-5 at 2-2.5 feet below ground surface), above the Regional Water

Board residential screening level of 0.016 mg/kg. Other PAHs were detected in soil but concentrations below their respective Regional Water Board residential screening levels.

3.3.3.3 METALS IN SOIL

Arsenic was detected in soil up to 8.6 mg/kg (SB-1 at 2.5-3 feet below ground surface), which is consistent with the background arsenic concentrations up to 11 mg/kg for the San Francisco Bay Area (Duverge, 2011). Lead was detected up to 19 mg/kg, below the Regional Water Board residential screening level of 80 mg/kg. Other metals were detected in the soil samples but at levels below their respective Regional Water Board ESLs.

3.3.3.4 VOCS IN SOIL GAS

VOCs were not detected in soil gas at concentrations above their respective Regional Water Board residential screening levels. Methane was detected in soil gas at 212 ppmv below its CalEPA action level of 5,000 ppmv.

3.3.4 Eastern Side of Subject Property

3.3.4.1 TPH AND VOCS IN SOIL

TPHd was detected up to 290 mg/kg (SB-16 at 2-2.5 feet below ground surface), above Regional Water Board residential screening level of 230 mg/kg. TPHmo was detected up to 2,200 mg/kg (SB-16 at 2-2.5 feet below ground surface), below its Regional Water Board residential screening level of 11,000 mg/kg. VOCs were not detected in soil samples above their respective laboratory-reporting limits.

3.3.4.2 PAHS IN SOIL

Benzo(a)anthracene was detected in soil up to 0.750 mg/kg (SB-15 at 2-2.5 feet below ground surface), above the Regional Water Board residential screening level of 0.160 mg/kg. BaP was

detected in soil up to 1.0 mg/kg (SB-15 at 2-2.5 feet below ground surface), above the Regional Water Board residential screening level of 0.016 mg/kg. Benzo(b)fluoranthene was detected in soil up to 1.1 mg/kg (SB-15 at 2-2.5 feet below ground surface), above the Regional Water Board residential screening level of 0.100 mg/kg. Dibenz(a,h)anthracene was detected in soil up to 0.017 mg/kg (SB-15 at 2-2.5 feet below ground surface), above the Regional Water Board residential screening level of 0.016 mg/kg. Other PAHs were detected in soil but concentrations below their respective Regional Water Board residential screening levels.

3.3.4.3 METALS IN SOIL

Arsenic was detected in soil up to 4.2 mg/kg (SB-16 at 2-2.5 feet below ground surface), which is consistent with the background arsenic concentrations up to 11 mg/kg for the San Francisco Bay Area (Duverge, 2011). Lead was detected up to 2,100 mg/kg, above the Regional Water Board residential screening level of 80 mg/kg. Other metals were detected in the soil samples but at levels below their respective Regional Water Board ESLs.

3.3.4.4 VOCS IN SOIL GAS

VOCs were not detected in soil gas at concentrations above their respective Regional Water Board residential screening levels. Methane was detected in soil gas at 134,000 ppmv above its CalEPA action level of 5,000 ppmv.

3.4 DATA GAP ANALYSIS

The findings of the investigations identified:

- TPH, PAHs and lead in soil above their respective Regional Water Board screening criteria within the upper three feet at the Site;
- Methane below its action level in the areas near the former USTs (Areas 1 and 2) and near the Loading Dock Building;

- Methane above its action level within the Eastern Side of Subject Property area; and

- Shallow groundwater containing petroleum hydrocarbons.

Based on the investigation findings, the distribution of TPH, PAHs and lead in soil and methane associated with the former USTs has been adequately characterized. However, additional investigations appear warranted to further characterize the presence of methane within the Eastern Side of Subject Property area.

The presence of methane appears associated with biogenic breakdown of organic material associated with the underlying Bay Mud. The underlying Bay Mud is present between approximately 2-feet and 5-feet below the ground surface within the Eastern Side of Subject Property. The Bay Mud is present at deeper depths, i.e., between 5-feet and 7-feet, below the remainder of the Site (Figure 2-2). Therefore, additional sampling to characterize the extent of methane within the subsurface is needed.

4.0 EVALUATION OF REMEDIAL TECHNOLOGIES

Pursuant to the requirements of *Resolution No. 92-49 Policies and Procedures for Investigation and Cleanup and Abatement of Dischargers Under Water Code Section 13304*, remedial technologies were identified and evaluated with respect to effectiveness, feasibility and relative costs of applicable alternative methods for cleanup. Based on previous analysis of analogous sites, remedial technologies have been selected. The selected technologies included: soil excavation; engineering controls; and institutional controls, to address TPHd, PAHs and lead in soil; and methane in soil gas. The additional methane data, as identified in Section 3.3, will be used to determine the extent of engineering control deployment to address methane in the subsurface. The supporting rationale for the selected technologies is presented below.

4.1 EXCAVATION

Vadose zone excavation can be an effective technology in removing both source material bound to geologic material, as well as the gas phase contaminants present in the interstitial soil voids. Excavation can be accomplished using conventional equipment, including excavators, backhoes or other equipment.

4.2 ENGINEERING CONTROLS

Engineering controls encompass a variety of barriers (e.g., soil capping, hardscapes, subsurface venting systems, fences, etc.) to contain or prevent exposure to contamination on a property (USEPA, 2010). To address potential direct contact to TPHd, PAHs and lead in soil, engineering controls include placement of excavated soil on-Site as engineered fill beneath buildings and hardscapes. While groundwater is not a potential drinking water source beneath the Site, the potential exists for preferential migration of groundwater containing petroleum hydrocarbons along utility corridors. Engineering controls including trench dams can be used to mitigate preferential migration.

To address methane in soil gas, engineering controls can include both active and passive techniques. Vapor intrusion mitigation may be taken as a proactive measure to avoid a costly characterization study (USEPA, 2008) and include passive and active subslab venting/barrier systems.

4.3 INSTITUTIONAL CONTROLS

Institutional controls are legal and/or physical means of limiting or eliminating potential human exposures. Institutional controls include deed restrictions and land use covenants that limit Site access and land uses to protect human health. Institutional controls also can be effective, especially, when used in conjunction with other remedial technologies. In addition, if the cleanup does not result in unrestricted use, institutional controls can be used to limit potential exposure to subsurface contaminants by limiting activities on a property.

4.4 PREFERRED REMEDIAL ACTION

Based on the technical analyses, the remedial actions have been selected to address the presence of TPHd, lead and PAHs in soil and methane in soil gas. The remedial actions include:

- Excavation of soil containing TPHd, PAHs and lead within the proposed landscape planter areas to a depth of approximately 3-feet below finished grade; placement of a fabric marker and backfilling with clean imported soil;

- On-Site reuse of excavated soil as engineered fill beneath buildings and hardscapes;

- Off-Site disposal of soil generated from the excavations not used as engineered fill;

- Installation of subslab vapor mitigation system beneath occupied building(s), as necessary, to control methane vapor intrusion;

- Installation of trench dams within utility corridors to control preferential migration of shallow groundwater containing petroleum hydrocarbons; and

- Land use controls to limit exposure to subsurface contaminants; preparation of a Residual Risk Management Plan (RRMP), which details the procedures and protocols for managing soil and groundwater during post-construction maintenance activities.

5.0 REMEDIAL ACTION IMPLEMENTATION

The preferred remedial actions include: excavation, on-Site reuse as engineered fill and/or off-site disposal for soil; installation of subslab vapor mitigation system for methane; and land use restrictions and preparation of a *RRMP*. Therefore, measures to manage on-Site reuse of the soil containing TPHd, PAHs and lead and methane in soil gas as part of the Site development are recommended. The landscape excavation and methane mitigation areas are depicted on Figures 5-1 and 5-2.

Prior to implementation of the remedial actions, the following activities will be conducted: obtaining necessary permits and agency approvals; conducting proper notification; and obtaining approval from the ACEH. Details of the implementation activities are presented below.

- Task 1: Supplemental vapor sampling to further characterize the presence of methane in the subsurface;
- Task 2: Excavate soil containing lead and PAHs above residential screening levels and reuse beneath hardscape and buildings;
- Task 3: Install methane mitigation system beneath occupied structures;
- Task 4: Install trench dams within utility corridors to control shallow groundwater;
- Task 5: Prepare a Residual Risk Management Plan (RRMP) to present the requirements for post-development soil and groundwater management;
- Task 6: Record a Land Use Covenant (LUC), which incorporates the RRMP requirements; and
- Task 7: Remedial Action Completion Report.

5.1 TASK 1: SUPPLEMENTAL VAPOR SAMPLING

As identified in Section 3.3, additional vapor samples will be collected to further characterize the presence of methane in the subsurface within the Eastern Side of Subject Property (Figure 5-1). Details of the additional vapor sample collection methodology are presented below.

5.1.1 Sample Probe Installation

Sampling probes will be installed in accordance with the 2011 California Environmental Protection Agency's (CalEPA) Department of Toxic Substances Control (DTSC) *Final Guidance for the Evaluation and Mitigation of Subsurface Vapor Intrusion to Indoor Air* (*Vapor Intrusion Guidance*). The sampling probes will be installed by advancing a small diameter boring using a hand-held electric roto-hammer outfitted with an approximately 1-inch in diameter drill bit through the asphalt or concrete ground surface to approximately 3-inches below the base of the ground cover.

Following completion of the boring, a sample point consisting of 0.125-inch to 0.25-inch Teflon™, Nylaflow or metal tubing fitted with permeable probe tip will be installed in the boring. Sand will be placed around the probe tip. The boring annulus will then be filled with dry bentonite to above the base of the ground cover. Bentonite hydrated with de-ionized water will be placed above the dry granular bentonite to the surface. The sample probes will then be allowed to equilibrate for at least two hours before samples are collected.

5.1.2 Sample Collection

Vapor samples will be collected from the sample probes in accordance with CalEPA's July 2015 *Advisory Active Soil Gas Investigation* and the whole gas sampling technique as outlined in ASTM D 5466 *Standard Test Method for Determination of Volatile Organic Chemicals in Atmospheres - Canister Sampling Methodology* (ASTM D 5466). The samples will be collected using laboratory-supplied one-liter passivated stainless steel Summa canisters with

approximately 30-inches of mercury vacuum. The vacuum within the Summa canisters will be measured before sample collection to document the canister atmosphere.

Prior to sample collection, the monitoring point and above grade tubing will be purged at a rate of 200 milliliters per minute (ml/min) with a vacuum of less than 100-inches of water. The total volume purged prior to sample collection will be equal to three volumes of air in the open space of tubing and the sample point. Samples will also be collected at a flow rate of 200 ml/min with a vacuum of less than 100-inches of water until a complete sample has been collected.

The vapor samples will be collected using one-liter Summa canisters fitted with a flow orifice pre-calibrated to collect a one-liter sample at 200 ml/min. Once the sampling has been completed, the canisters will be transported to a California Department of Public Health Environmental Laboratory Accreditation Program certified laboratory following ATM D 4840 chain-of-custody procedures for methane using United States Environmental Protection Agency (USEPA) Method 18 and helium using Method ASTM D 1945.

5.2 TASK 2: SOIL EXCAVATION AND REUSE

5.2.1 Permitting and Utility Clearance

Prior to implementation, the necessary approvals, permits and licenses required by local, state and federal agencies, as necessary, will be obtained. In addition, affected parties will be notified of the scheduled work dates approximately one week prior to commencing work.

Prior to implementation of the actions, appropriate notifications will be made to USA to locate and clear work areas for underground utilities at the Site. The work areas will also be cleared for underground utilities using a private underground utility locating contractor.

5.2.2 Worker Health and Safety

Due to the potential exposure to TPH, PAHs and lead in soil, prior to Site development activities, a HASP will be prepared and followed by on-Site personnel. The HASP will be prepared to address the requirements of the Occupational Health and Safety Administration (OSHA) 29 CFR 1910.120 guidelines and Title 8 CCR Section 5192. The HASP will be read by Site workers and visitors to apprise them of the Site conditions and provide instructions for implementing proper safety training and procedures during development activities.

As phases of work proceed, the HASP will be updated to reflect: Site organizational structure; names of key personnel; personnel training requirements; medical surveillance program; summary of risk assessment; a task-specific hazard analysis; Site control program; personal protective equipment use; air monitoring plan; decontamination procedures; emergency response plan; spill containment; Site sanitation facilities; and standard operating procedures. The contractor conducting the development activities will also use their Injury and Illness Prevention Program (IIPP) in conjunction with the HASP.

5.2.3 Site Preparation

Prior to soil excavation, the asphalt/concrete floor will be removed to expose the underlying soil. Pursuant to AB 939 requirements, concrete will be recycled to the extent possible.

5.2.4 Soil Excavation

The proposed landscape areas will be excavated to a depth of approximately 3-feet below finished grade using hydraulic excavating equipment operated by a California Class A Hazardous Waste licensed contractor (Figure 5-1). The excavated soil will then be stockpiled on-Site for future placement as engineered fill.

5.2.5 Soil Handling

It is anticipated that the excavated soil will be stockpiled prior to on-Site reuse. The soil will be handled in a manner to minimize the potential for airborne dust to be generated. During soil handling, air monitoring will be conducted and used to confirm the efficacy of soil handling procedures. As appropriate, procedures will be modified to control emissions of dust. Disturbed areas that are inactive for seven days or more will also be wetted to minimize potential airborne entrainment and generation of dust.

5.2.5.1 AIR MONITORING

Visual and real-time air monitoring for respirable dust will be performed during excavation and soil handling activities. The objective of the air-monitoring program is to document conditions, and as appropriate, adjust work activities to protect the health and safety of the on-Site construction workers and nearby community. The real-time dust monitoring will be conducted at upwind and downwind locations. The upwind and downwind monitoring locations will be adjusted, a necessary, depending on the direction of the prevailing winds.

Real-time respirable dust air monitoring will be performed using a Monitoring Instruments for the Environment, Inc. (MIE) data logging real time monitor, model PDR-1000 respirable air monitor (RAM) or equivalent. The PDR 1000 is designed to measure the concentration of airborne particulate matter using a high sensitivity nephelometer (photometer) using a light scatter sensor. Sensitivity of the PDR 1000 is reported to range from 0.001 milligrams per cubic meter (mg/m^3) to 400 mg/m^3. The RAM will be calibrated daily.

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Lead has a California Occupational Safety and Health Administration (CalOSHA) Permissible Exposure Limit (PEL) of 0.05 mg/m^3 and an Action Level (AL) of 0.03 mg/m^3. Based on the maximum concentration for lead in soil at 14,000 mg/kg, approximately 1.8 mg/m^3 of total dust would need to be generated to exceed the AL of 0.03 mg/m^3. However, the reasonable maximum

exposure (RME) concentration (95-percent upper confidence level of the mean concentration for lead was calculated at 4,600 mg/kg. Based on the RME for lead of 4,600 mg/kg, approximately 6.5 mg/m^3 of total dust would need to be generated to exceed the lead AL of 0.03 µg/m^3 (Appendix D).

Respirable dust has an OSHA PEL of 5.0 mg/m^3 and an AL of 2.5 mg/m^3. The respirable dust action level of 2.5 mg/m^3 is below the concentration of total dust needed to exceed the lead AL. Therefore, if visible dust is observed, engineering controls, i.e., soil wetting, should be implemented to control fugitive dust emissions.

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The California Air Resources Control Board (CARB) sets 24-hour 10 micron or smaller dust particulate matter (PM10) California Ambient Air Quality Standard (CAAQS) concentration of 0.05 mg/m^3 at the Site perimeter. Therefore, engineering controls, i.e., soil wetting, should be implemented during excavation activities if dust levels at the Site perimeter exceed the CARB CAAQS concentration.

5.2.5.2 DUST CONTROL

Dust control will be performed by applying water with a low-pressure spray system. Low volumes of potable water will be routinely spread in areas where dust may be generated because of excavation activities. If monitoring indicates that the dust control measures are not adequate, then additional engineering control measures will be implemented. These additional measures will include, but are not limited to: 1) change of work procedures; 2) soil wetting during and excavation, stockpiling, backfilling and loading; 3) tarping of trucks; and 4) covering of exposed excavations and stockpiles with plastic sheeting; and 5) use of dust palliatives.

5.2.6 Geotextile Placement

Following soil removal from the landscaped areas, a non-biodegradable woven geotextile fabric (Mirafi Orange Delineation Non-woven Geotextile or equivalent) will be placed at the base of the excavations as a marker. A copy of a geotextile specification is included in Appendix E.

5.2.7 Groundwater Management

Groundwater encountered in excavations advanced during Site development will be removed from the excavations, as necessary, containerized on-Site and managed for off-Site disposal. Groundwater management options include off-Site transportation to an appropriate disposal facility or discharge to the sanitary sewer under a permit obtained from the wastewater treatment plant in accordance with local permit requirements.

5.2.8 Backfilling

Imported fill material will be used for backfilling of excavations. Soil samples will be collected from borrow areas for characterization prior to import and placement at the Site. The laboratory analytical results of the soil samples collected from the proposed imported fill material borrow areas will be compared to the Regional Water Board Tier 1 ESLs, with concurrence from the ACEH. A summary of the imported fill material soil sample collection methodology is presented below.

5.2.8.1 SOIL SAMPLE COLLECTION METHODOLOGY

The contractor will identify borrow areas and soil samples will be collected as appropriate. The frequency of sampling will be conducted in general following the California Department of Toxic Substances' (DTSC) *Information Advisory – Clean Imported Fill Material*. The borrow area soil samples will be collected in pre-cleaned brass liners or glass jars, labeled and placed in a chilled cooler for transportation to a CDPH ELAP laboratory following ASTM D 4840 chain-

of-custody protocols. The soil samples will be analyzed for the suite of analytes in accordance with DTSC's *Advisory for Clean Imported Fill Material*.

5.2.9 Soil Stockpile Management

The following procedures will be used for management of soil stockpiles. The soil stockpiles will be covered with plastic sheeting to control dust. Stockpiled areas will also be bermed to prevent storm water erosion and/or runoff. Uncovered stockpiles will be watered pursuant to dust control requirements to minimize airborne particulate emissions. The berms surrounding the stockpiled area will be inspected and maintained when the stockpiles are uncovered and water is applied for dust control.

Any portions of the stockpile not being actively worked on during a given day will remain covered with plastic sheeting. Plastic sheeting will be held in place by tires, concrete or other appropriate weighted material. Excavations, stockpiles and inactive work areas will be inspected regularly to assess the potential for dust generation. Stockpiles will be inspected daily for proper cover.

5.2.10 Soil Disposal

Excavated soil not reused on-Site for engineered fill will be stockpiled, characterized and profiled for off-Site transportation and disposal. Procedures for characterizing the excavated soil are presented below.

5.2.10.1 DISPOSAL CHARACTERIZATION

Samples will be collected to properly characterize the soil prior to off-Site disposal. The final destination of excavated soil will be selected based on the waste analytical results and acceptance criteria provided by the waste management facilities. The soil samples results will be evaluated using the procedures outlined in *Test Methods for Evaluating Solid Waste, Physical/Chemical*

Methods (SW-846). USEPA's SW-846 identifies that the statistically representative concentration will be used when characterizing solid wastes with potentially variable concentrations, i.e., the 90 percent upper confidence level (UCL) concentration. The 90 percent UCL concentration represents the concentration that it is expected that 90 out of 100 samples will have concentrations equal to or less than. The number of samples and suite of analytes will be determined based on the nature and source of the contamination and waste facility requirements.

A statistical analysis using a Student's "t-test" will be performed using the sample results to determine the 90 percent UCL concentration of the regulated constituents in the samples. The results of the sampling will also be evaluated to determine whether an appropriate number of samples have been collected to characterize the waste using methodologies as outlined in USEPA's SW-846. The results of the stockpile soil sampling and statistical analysis will be forwarded to landfills or other appropriate facilities for profiling and acceptance.

Stockpile Sampling Methodology

Discrete samples will be collected from the stockpiled soil for characterization. The frequency of sampling will be conducted in general following the California Department of Toxic Substances' (DTSC) *Information Advisory – Clean Imported Fill Material* and in accordance with the waste management facility for soil requiring off-Site disposal. The discrete soil samples will be collected from at least three to six-inches below the surface of the stockpile by hand pushing brass-lined tubes into each portion of the stockpile. The ends of the brass-lined tubes will be covered with Teflon© sheets and plastic end caps, labeled, sealed in a plastic bag and placed in a chilled ice chest. Following appropriate sample collection protocols, the soil samples will be transported to a CDPH ELAP certified laboratory for chemical analysis, following ASTM D 4840 chain-of-custody protocols. The stockpiled samples will be analyzed for the constituents required by the waste management facility for soil requiring off-Site disposal.

5.2.10.2 OFF-SITE SOIL TRANSPORT

Following acceptance by the disposal facility, the stockpiled soil will be loaded into trucks operated by licensed transporters for off-Site disposal. Non-hazardous soils will be transported off-Site using appropriate bills of lading. Hazardous wastes will be manifested off-Site on Uniform Hazardous Waste Manifests in accordance with regulatory requirements. It is expected that the excavated soil will be segregated and disposed at Class I and/or Class II waste management facilities. Appropriately, designated and licensed trucks will be used to convey the soil from the Site to the disposal facilities. In addition, trucks transporting soil off-Site will not be loaded above the side or rear of the truck bed. The truckload will be covered with a tarp prior to leaving the Site to prevent particulate emissions to the atmosphere.

5.2.10.3 RECORDKEEPING

A log sheet will be maintained that documents the date, time, estimated volume, waste/material, trucking company, driver and vehicles used for the trip. The log will also document the decontamination procedures of the trucks. Log sheets will be kept at the Site. In addition, copies of bills-of-lading, analytical results representing the load, hazardous waste manifests (as appropriate), route maps and directions, emergency instructions and contacts will be carried with each load leaving the Site.

5.3 TASK 3: METHANE MITIGATION SYSTEM

A methane mitigation system will be installed to control subsurface migration of vapors beneath the building where methane was detected above action level (Figures 5-1 and 5-2). Based on the findings of the additional vapor investigation, the methane mitigation system will be deployed, as necessary, if methane is detected above its action level in areas beneath other proposed buildings.

The vapor mitigation system will be comprised of a dispersion vent layer and vent riser, vapor barrier and foundation seals typically installed between the backfill and the floor slab of the

buildings. Figure 5-2 illustrates a typical design. Additionally, utility trench vapor dams will be installed. The vapor mitigation system will be adaptable for active ventilation, if post-construction monitoring warrant such modification. The developer/owner's licensed professional engineer shall prepare engineering drawings and specifications for the methane mitigation system. The drawings and specifications will be submitted to the ACEH for review and approval prior to installation. Details of methane mitigation system are presented below.

5.3.1 Dispersion Vent Layer

A dispersion layer vent system will be installed to provide a higher permeability zone, i.e., preferential pathway, for the gas to migrate and vent to atmosphere. The dispersion layer will be comprised of a minimum of 4-inches of coarse aggregate meeting ASTM 57, with 85 percent of the surface consisting of fractured faces. The coarse aggregate shall have an open gradation with 100 percent passing the 1.5-inch sieve; 95 to 100 percent passing the 1.0-inch sieve; 26 to 60 percent passing the 0.5-inch sieve; 0 to 10 percent passing the No. 4 sieve; and 0 to 5 percent passing the No. 8 sieve. A Geovent™ gas venting core or equivalent will be installed within the dispersion vent layer and connected to a vent riser which will extend vertically to the building roof (Figure 5-2). A copy of the Geovent™ specification is included in Appendix E.

5.3.2 Vapor Barrier

The overlying building foundation in conjunction with membranes and other barriers will be used to retard upward migration of vapors. The vapor barrier layers will include a permeable vented zone overlaid with: a 16 mil high-density polyethylene (HDPE) membrane; 40 mil spray applied asphalt/rubber barrier; and a 100 mil non-woven geotextile.

5.3.2.1 VAPOR BARRIER INSTALLATION

Proper installation of the vapor barrier is essential for optimal performance. Small imperfections in the barriers (e.g., due to holes, tears, or incomplete seals at the footings or pipe penetrations)

can provide a migration route for soil gas when buildings are under negative relative pressure (compared to soil gas pressure).

The vapor barrier must be tested following construction of the vapor barrier and before the placement of concrete over the barrier. The testing will be performed by blowing smoke or some tracer gas under the membrane. If smoke is detected outside of the barrier, additional measures will be undertaken. Methods will be developed to pinpoint imperfections and repair them after installation, e.g., smoke and/or tracer gas testing. Once smoke tested and receiving approval/passing test, the concrete slab/pads may be poured completing the foundation.

The construction will follow quality control procedures, including training of construction workers, to minimize barrier damage during installation and subsequent construction. The installation requirements will include the use of: certified installers; certified inspectors; and smoke testing.

A construction quality assurance plan (CQA Plan) will be used during the installation and testing of the vapor barrier. The CQA Plan will be submitted to ACEH as part of the engineering drawings and specifications. The CQA Plan will follow the applicable ASTM standards for underslab vapor retarders; including those for material specifications with specific criteria that the material has to meet; both applicable to new materials as well as materials that are conditioned or exposed to simulate service conditions; and the placement and installation of the vapor retarder. Specifically, the following ASTM standards will be followed, as applicable:

- ASTM E1993: Standard Specification for Bituminous Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs;
    - This covers bituminous membrane water vapor retarders and specifies requirements for water vapor permeance, tensile strength, puncture resistance, and thickness.

- ASTM E1745: Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs;
    - This covers plastic water vapor retarders and classifies the material into either Class A, B, and C based on: water vapor permeance; tensile strength; puncture resistance.
    - Water Vapor Permeance requirements per ASTM E1745-11 call for a vapor retarder material to have a maximum permeance rating of 0.1 perms.
- ASTM E1643: Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.

5.3.3 Foundation Seals

The design also requires sealing of foundation penetrations. Penetrations of the foundation include plumbing, electrical conduits and expansion joints installed during construction. Improper sealing may also increase operational costs due to excessive indoor air flow relative to soil gas capture.

5.3.4 Utility Trench Vapor Dams

Vapor dams will be installed in utility trenches that extend beneath the building foundation from areas outside the perimeter of the at-grade residential units to mitigate preferential migration of vapors. The trench dams will consist of a cement, bentonite and water slurry or controlled low-strength material placed within the utility trench extending a minimum of five feet beginning immediately adjacent to the exterior perimeter of the building foundation and placed a minimum of six inches above the bottom of the perimeter footing to the base of the trench. Details of the trench dams are included in Appendix E.

5.3.5 Post-Construction Monitoring

To document the effectiveness of the methane mitigation system, post-construction sampling will be conducted. The sampling will include collection of subslab samples one time prior to building occupancy following building completion. Details of the post-construction monitoring will be presented in the RRMP to be submitted separately.

5.4 TASK 4: UTILITY TRENCH DAMS

Trench dams will be installed at the Site within utility corridors to control preferential migration of shallow groundwater containing petroleum hydrocarbons. The trench dams will be installed as noted in Section 5.3.4. Details of the trench dams are included in Appendix E.

5.5 TASK 5: RESIDUAL RISK MANAGEMENT PLAN

The RRMP specifies procedures and protocols for future maintenance workers for managing soil and groundwater beneath the capped areas and marker fabric. The RRMP will be used in conjunction with the installed engineering controls, i.e., vapor mitigation system, to control potential exposures to chemicals in the subsurface. The RRMP will be submitted to the ACEH for review and approval separately. Implementation of this RRMP will be the responsibility of the Site owner including its construction manager, contractors, subcontractors and future maintenance workers.

5.6 TASK 6: LAND USE COVENANT

Following completion of Site remedial actions, a land use covenant (LUC) will be prepared and recorded with the Alameda County Recorders Office. The LUC identifies restrictions that are reasonably necessary to protect human health and safety or the environment due to the presence of hazardous materials beneath the Site including but not limited to:

- Site use shall be for industrial, commercial, office space, retail, restaurant, and/or multi-family residential, in conformance with local zoning code;

- All uses and development of the Site shall be consistent with the RRMP, which shall be into the LUC by reference;

- No wells for the purpose of extracting water for any use, including but not limited to, domestic, potable, or industrial uses, shall be allowed on the Site or any portion thereof unless expressly permitted in writing by the ACEH;

- ACEH shall have reasonable access to the Site for the purposes of inspection, surveillance, maintenance, or monitoring, as provided for in Division 7 of the Water Code; and

- No owner or occupant of the Site shall act in any manner that will aggravate or contribute to the existing environmental conditions of the Site. All use and development of the Site shall preserve the integrity of any remedial measures or installations.

5.7 TASK 7: COMPLETION REPORT

Following completion of the remedial actions a report will be prepared that details the RAP implementation activities. The report will include:

- Introduction and executive summary; including remedial actions, and any changes to the remedial design or field activities;
- Field data sheets with all observations (i.e., notes, charts, sketches, or photographs), air monitoring results, and a record of field and/or laboratory tests;

- Details of the activities, including: soil excavation areas; engineered fill placement areas; soil disposal documentation; methane mitigation system installation; trench dam installations; sample locations; laboratory data certificates; and copies of the chain-of-custody forms; and
- Summary of deviations from the RAP.

The *Completion Report* will be prepared under the supervision of a California Professional Civil Engineer and Geologist, with appropriate qualifications.

6.0 REFERENCES

Alameda County Environmental Health, *Case Closure for Fuel Leak Case No. RO0000039 (Geotracker Global ID T0600102107), Roadway Express, 1708 Wood Street, Oakland, California*, July 30, 2015 (ACEH, 2015).

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Grafcon, *Environmental Site Summary, 1708 Wood Street, Oakland, California*, November 21, 2016 (Grafcon, 2016).

Quantum Geotechnical, Inc., *Geotechnical Investigation on Proposed Residential Development, Roadway Express at 1708 Wood Street, Oakland, California*, August 3, 2016).

State Water Resources Control Board, *Resolution No. 92-49: Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304*, October 2, 1996 (SWRCB, 1996).

United States Environmental Protection Agency (USEPA), *Indoor Air Vapor Intrusion Mitigation Approaches, Engineering Issue*, EPA/600/R-08-115, October 2008 (USEPA, 2008).

United States Environmental Protection Agency (USEPA), Office of Solid Waste and Emergency Response, *Engineering Controls Fact Sheet: Engineering Controls on Brownfields Information Guide: How They Work with Institutional Controls; the Most Common Types Used; and an Introduction to Costs, EPA-560-F-10-005*, November 2010 (USEPA, 2010).

7.0 DISTRIBUTION LIST

Mr. Martin Ward
PSAI Realty Partners
155 Montgomery Street, Suite 1600
San Francisco, CA 94104

Mr. Keith Nowell, P.G., C.H.G.
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502

TABLES

TABLE 2-1
SUMMARY OF SOIL ANALYTICAL RESULTS-TPH and VOCS
1708 Wood Street
Oakland, California

Sample ID	Date	Depth (ft bgs)	TPHg	TPHd	TPHmo	Total Oil & Grease	Benzene	Toluene	Ethyl benzene	Total Xylenes	MTBE
Area 1-Northwestern UST Area											
BM-7	12/10/07	6	~~0.5 U~~	~~0.5 U~~	~~86~~	--	--	--	--	--	--
BM-8	~~12/10/07~~	~~7~~	~~0.5 U~~	~~0.5 U~~	~~1,700~~	--	--	--	--	--	--
BM-9	~~12/10/07~~	~~5~~	~~0.5 U~~	~~0.5 U~~	~~83~~	--	--	--	--	--	--
BM-16	8/5/08	19	1.0 U	2.4 SG Y	13 SG	--	5.2 U	5.2 U	5.2 U	5.2 U	21 U
		29	1.0 U	1.0 SG	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	20 U
BM-17	8/5/08	10.5	1.0 U	2.4 SG Y	16 SG	--	5.0 U	5.0 U	5.0 U	5.0 U	20 U
		23	1.0 U	3.1 SG Y	15 SG	--	4.9 U	4.9 U	4.9 U	4.9 U	19 U
		25	1.0 U	1.3 SG Y	8.2	--	5.2 U	5.2 U	5.2 U	5.2 U	21 U
BM-18	8/5/08	2.5	1.0 U	3.7 SG Y	16 SG	--	4.9 U	4.9 U	4.9 U	4.9 U	19 U
		8.5	1.0 U	< 1.0 SG	< 5.0 SG	--	5.1 U	5.1 U	5.1 U	5.1 U	20 U
		12.5	0.9 U	2.0 SG Y	13 SG	--	4.7 U	4.7 U	4.7 U	4.7 U	19 U
BM-19	8/5/08	8.0	1.0 U	7.6 SG Y	15 SG	--	4.9 U	4.9 U	4.9 U	4.9 U	20 U
		11	1.0 U	3.7 SG Y	19 SG	--	4.9 U	4.9 U	4.9 U	4.9 U	20 U
		19	1.0 U	1.0 U	5.0 U	--	4.9 U	4.9 U	4.9 U	4.9 U	19 U
		22	0.9 U	1.0 U	5.0 U	--	4.7 U	4.7 U	4.7 U	4.7 U	19 U
SB-1	2/15/11	2.5-3	0.3 U	10	49 U	510	0.005 U	0.005 U	0.005 U	0.01 U	0.005 U
SB-2	~~2/15/11~~	~~2.5-3~~	~~0.3 U~~	~~130~~	~~49~~	~~540~~	~~0.006 U~~	~~0.006 U~~	~~0.006 U~~	~~0.011 U~~	~~0.006 U~~
SB-3	~~2/15/11~~	~~--~~	~~0.3 U~~	~~21~~	~~61~~	~~1,000~~	~~0.006 U~~	~~0.006 U~~	~~0.006 U~~	~~0.011 U~~	~~0.006 U~~
WEST-W	10/31/11	16	0.2 U	10 U	20 U	--	0.0077 U	0.0077 U	0.0077 U	0.0015 U	0.0077 U
WEST-E	~~10/31/11~~	~~16~~	~~0.1 U~~	~~9.9 U~~	~~20 U~~	~~--~~	~~0.0053 U~~	~~0.0053 U~~	~~0.0053 U~~	~~0.0011 U~~	~~0.0053 U~~
EAST-W	~~10/31/11~~	~~15.5~~	~~0.1 U~~	~~9.9 U~~	~~20 U~~	~~--~~	~~0.0051 U~~	~~0.0051 U~~	~~0.0051 U~~	~~0.0010 U~~	~~0.0051 U~~
EAST-E	~~10/31/11~~	~~16~~	~~0.1 U~~	~~9.9 U~~	~~20 U~~	~~--~~	~~0.0055 U~~	~~0.0055 U~~	~~0.0055 U~~	~~0.0011 U~~	~~0.0055 U~~
SW1-E3	11/18/11	--	1.1	42	196	--	0.0092U	0.0092U	0.0092U	0.018U	0.0092U
SW2-N5	11/18/11	--	4.8 J	173	76	--	0.240 U	0.240 U	0.240 U	0.490 U	0.240 U
SW3-W4B	11/18/11	--	40	206	40 U	--	0.420U	0.420U	0.420U	0.840 U	0.420U
SW4-W	11/18/11	3.5	104	**5,930**	1,140 J	--	4.800 U	4.800 U	4.800 U	0.600 U	4.800 U

TABLE 2-1
SUMMARY OF SOIL ANALYTICAL RESULTS-TPH and VOCS
1708 Wood Street
Oakland, California

Sample ID	Date	Depth (ft bgs)	TPHg	TPHd	TPHmo	Total Oil & Grease	Benzene	Toluene	Ethyl benzene	Total Xylenes	MTBE
Area 2-Central UST Basin/Oil Water Separator Area/Maintenance Shop											
B-1	7/1/97	--	1 U	1 U	--	--	--	--	--	--	--
B-3	7/1/97	--	1 U	**240**	--	--	--	--	--	--	--
B-4	7/1/97	--	1 U	1 U	--	--	--	--	--	--	--
B-5	7/1/97	--	1 U	5.4	--	--	--	--	--	--	--
B-6	7/1/97	--	1 U	1 U	--	--	--	--	--	--	--
B-7	7/1/97	--	1 U	1 U	--	--	--	--	--	--	--
B-8	7/1/97	--	1 U	1 U	--	--	--	--	--	--	--
BM-2	12/10/07	5	0.50 U	8.8 Y	86	--	--	--	--	--	--
		13	0.50 U	0.50 U	--	--	--	--	--	--	--
BM-10	12/10/07	5	0.9 U	4.5 SG Y	12 SG	--	0.005 U	0.005 U	0.005 U	0.005 U	0.019 U
		24	0.9 U	1.0 U	5.0 U	--	0.005 U	0.005 U	0.005 U	0.005 U	0.018 U
BM-11	12/10/07	2.5	0.9 U	30 SG Y	860 SG Y	--	0.005 U	0.005 U	0.005 U	0.005 U	0.019 U
		11	0.9 U	1.0 U SG	5.0 U	--	0.005 U	0.005 U	0.005 U	0.005 U	0.019 U
		20	1.0 U	1.1 SG Y	5.0 U	--	0.005 U	0.005 U	0.005 U	0.005 U	0.018 U
BM-12	12/10/07	3	1.0 U	65 SG Y	130 SG	--	0.005 U	0.005 U	0.005 U	0.005 U	0.018 U
		9.5	0.9 U	1.2 SG Y	10 SG	--	0.005 U	0.005 U	0.005 U	0.005 U	0.019 U
		19.5	1.0 U	1.0 U	5.0 U	--	0.005 U	0.005 U	0.005 U	0.005 U	0.020 U
BM-13	12/10/07	3.5	1.0 U	3.7 SG Y	13SG	--	0.005 U	0.005 U	0.005 U	0.005 U	0.021 U
		21	1.0 U	1.0 U	5.0 U	--	0.005 U	0.005 U	0.005 U	0.005 U	0.021 U
BM-14	12/10/07	3	1.0 U	56 SG Y	90 SG	--	0.005 U	0.005 U	0.005 U	0.005 U	0.020 U
		17.5	1.0 U	1.0 U	5.0 U	--	0.005 U	0.005 U	0.005 U	0.005 U	0.020 U
		23.5	1.0 U	1.0 U	5.0 U	--	0.005 U	0.005 U	0.005 U	0.005 U	0.019 U
BM-15	12/10/07	3.5	1.0 U	45 SG Y	320 SG	--	0.005 U	0.005 U	0.005 U	0.005 U	0.020 U
		11	1.0 U	1.3 SG Y	11 SG	--	0.005 U	0.005 U	0.005 U	0.005 U	0.020 U

TABLE 2-1
SUMMARY OF SOIL ANALYTICAL RESULTS-TPH and VOCS
1708 Wood Street
Oakland, California

Sample ID	Date	Depth (ft bgs)	TPHg	TPHd	TPHmo	Total Oil & Grease	Benzene	Toluene	Ethyl benzene	Total Xylenes	MTBE
OWS-1N	10/27/11	3	0.1 U	70	271	--	0.004 U	0.004 U	0.004 U	0.009 U	0.004 U
OWS-2NE	10/27/11	3	0.2	**1,420**	2,300	--	0.460 U	0.460U	0.460U	0.920 U	0.460 U
OWS-3E	10/27/11	3	0.1	28	78	--	0.004 U	0.004 U	0.004 U	0.009 U	0.004 U
OWS-4S	10/27/11	3.5	0.1 U	40	76	--	0.003 U	0.003 U	0.003 U	0.007 U	0.003 U
OWS-5W	10/27/11	3	0.1 J	55	89	--	0.006 U	0.006 U	0.006 U	0.011 U	0.006 U
OWS-6F	10/27/11	4	0.604	**628**	510	--	0.510 U	0.510 U	0.510 U	1.0 U	0.510 U
OWS-11-A	10/27/11	3	0.1 U	10 U	20 U	--	0.007 U	0.007 U	0.007 U	0.001 U	0.007 U
OWS NEA	10/27/11	3	0.1 U	7.1 J	16.4 J	--	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U
OWSL 1	10/27/11	4	0.1 U	10 U	20 U	--	0.007 U	0.007 U	0.007 U	0.001 U	0.007 U
OWSL 2	10/27/11	3	0.1 U	25	14.8 J	--	0.005 U	0.005 U	0.005 U	0.009 U	0.005 U
OWSL 3	10/27/11	4	0.1 U	9.5 J	10.2 J	--	0.006 U	0.006 U	0.006 U	0.011 U	0.006 U
OWSL 4	10/27/11	2	0.1 U	53	82	--	0.004 U	0.004 U	0.004 U	0.009 U	0.004 U
SB-9	3/18/11	1-1.5	0.2 U	6.1	50 U	--	--	--	--	--	--
SB-9	3/18/11	7.5-8	0.2 U	1.0 U	50 U	--	--	--	--	--	--
SB-11	2/16/11	2-2.5	310	**8,700**	3,400	20,000	0.013 U	0.013 U	0.013 U	0.027 U	0.013 U
SB-12	2/16/11	2-2.5	0.3 U	19	54	940	0.007 U	0.007 U	0.007 U	0.014 U	0.007 U
SB-13	2/16/11	1.5-2	0.3 U	2.3	50 U	490 U	0.006 U	0.006 U	0.006 U	0.011 U	0.006 U
SB-14	3/18/11	14.5-16	0.2 U	1.9	50 U	490 U	0.005 U	0.005 U	0.005 U	0.009 U	0.005 U
SB-20	3/18/11	1-1.5	--	--	--	--	--	--	--	--	--
		11.5-12	--	1.0 U	50 U	--	--	--	--	--	--
SB-22	3/18/11	1-1.5	0.3	**370**	2,100	--	--	--	--	--	--
		7.5-8	0.2 U	2	49 U	--	--	--	--	--	--
SB-23	3/18/11	1-1.5	0.3 U	57	280	--	--	--	--	--	
		7.5-8	0.2 U	2	49 U	--	--	--	--	--	--

TABLE 2-1
SUMMARY OF SOIL ANALYTICAL RESULTS-TPH and VOCS
1708 Wood Street
Oakland, California

Sample ID	Date	Depth (ft bgs)	TPHg	TPHd	TPHmo	Total Oil & Grease	Benzene	Toluene	Ethyl benzene	Total Xylenes	MTBE
Loading Doack Building											
SB-4	2/15/11	2-2.5	--	37	84	--	0.007 U	0.007 U	0.007 U	0.014 U	0.007 U
SB-5	2/15/11	2-2.5	--	220	420	--	0.007 U	0.007 U	0.007 U	0.013 U	0.007 U
SB-6	2/15/11	2-2.5	--	**2,700**	9,200	--	0.005 U	0.005 U	0.005 U	0.010 U	0.005 U
SB-7	2/16/11	2.5-3	--	1.7	50 U	--	0.010 U	0.010 U	0.010 U	0.020 U	0.010 U
SB-8	2/17/11	1.5-2	0.3 U	**2,400**	6,800	--	0.005 U	0.005 U	0.005 U	0.010 U	0.005 U
Eastern Side of Subject Property											
SB-15	2/16/11	2-2.5	0.3 U	45	240	--	0.005 U	0.005 U	0.005 U	0.011 U	0.005 U
SB-16	2/17/11	2-2.5	0.4 U	**290**	2,200	--	0.008 U	0.008 U	0.008 U	0.015 U	0.008 U
SB-24	3/18/11	1-1.5	--	55	110	--	--	--	--	--	--
		11.5-12	--	1.0 U	50 U	--	--	--	--	--	--
SB-25	3/18/11	1-1.5	--	8.0	49 U	--	--	--	--	--	--
		11.5-12	--	1.1	49 U	--	--	--	--	--	--
SB-26	3/18/11	1-1.5	--	25	60	--	--	--	--	--	--
		11.5-12	--	1.0 U	49 U	--	--	--	--	--	--
SB-27	3/18/11	1-1.5	--	80	170	--	--	--	--	--	--
		11.5-12	--	1.0 U	50 U	--	--	--	--	--	--
Residential ESLs			740	230	11,000	--	0.23	970	5.1	560	42
Construction Worker ESLs			2,800	880	32,000	--	24.00	4,100	480	2,400	3,700

Notes:

Bolded Values exceed its respective screening level (human health shallow soil residential)

All results reported in micrograms per kilogram (mg/kg)

J= EPA Flag-Estimated Value

U= Constituent not detected at or above the indicated value

SG= Sampled Analyzed with Silica Gel Cleanup

Y= Atypical Pattern

~~7.8~~ =Sample location excavated from site

TABLE 2-2
SUMMARY OF SOIL ANALYTICAL RESULTS-PAHS
1708 Wood Street
Oakland, California

Sample ID	Date	Depth (ft bgs)	Naphthalene	Acenaphthene	Accenaphthylene	Fluorene	Phenanthrene	Anthracene	Benzo(a)anthracene	Chrysene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(g, h, i)perylene	Indeno(1, 2, 3-cd)pyrene	Fluoranthene	Pyrene	Dibenz(a, h)anthracene
Area 1-Northwestern UST Area																		
SB-1	2/15/11	2.5-3	0.017	0.010 U	0.066	0.020	0.260	0.094	**0.300**	0.280	**0.270**	**0.270**	0.110	0.120	0.099	0.360	0.560	**0.037**
SB-2	~~2/15/11~~	~~2.5-3~~	~~0.010 U~~	~~0.010 U~~	~~0.0053~~	~~0.010 U~~	~~0.011~~	~~0.006~~	~~0.007~~	~~0.006~~	~~0.009~~	~~0.009~~	~~0.010 U~~	~~0.007~~	~~0.010 U~~	~~0.012~~	~~0.016~~	~~0.010 U~~
SB-3	~~2/15/11~~	~~--~~	~~0.010 U~~	~~0.010 U~~	~~0.010 U~~	~~0.010 U~~	~~0.010 U~~	~~0.010 U~~	~~0.010 U~~	~~0.010 U~~	~~0.010 U~~	~~0.010 U~~	~~0.010 U~~	~~0.010 U~~	~~0.010 U~~	~~0.010 U~~	~~0.010 U~~	~~0.010 U~~
Loading Dock Area																		
SB-4	2/15/11	2-2.5	0.029	0.058	0.022	0.081	0.670	0.200	**0.230**	0.200	**0.180**	**0.210**	0.084	0.069	0.068	0.530	0.570	**0.017**
SB-5	2/15/11	2-2.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.082	0.100	**0.160**	**0.180**	0.054	0.140	0.090	0.150	0.250	**0.017**
SB-6	2/15/11	2-2.5	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.055	0.083	**0.058**	0.100	0.001 U	0.001 U	0.001 U	0.065	0.099	0.001 U
SB-7	2/16/11	2.5-3	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.000 U	0.001 U	0.001 U
SB-8	2/17/11	1.5-2	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	0.250 U	**0.450**	0.760	**0.350**	**0.450**	0.250 U	0.250 U	0.250 U	0.250 U	0.680	0.250 U
Eastern Area/Historical Use Area																		
SB-15	2/16/11	2-2.5	0.500 U	0.500 U	0.170	0.078	0.900	0.150	**0.750**	0.850	**1.000**	**1.100**	0.490	0.480	0.400	1.400	2.000	**0.100**
SB-16	2/17/11	2-2.5	0.500 U	0.500 U	0.052	0.220	0.500 U	0.500 U	**0.220**	0.280	**0.340**	**0.450**	0.170	0.130	0.098	0.390	0.620	0.500 U
SB-24	3/18/11	1-1.5	0.099 U	0.099 U	0.110	0.099 U	0.540	0.160 U	**0.380**	0.420	**0.480**	**0.540**	0.240	0.230	0.190	0.740	1.100	0.099 U
		11.5-12	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SB-25	3/18/11	1-1.5	0.005 U	0.005 U	0.005 U	0.005 U	0.027	0.006	0.038	0.042	**0.039**	0.057	0.025	0.025	0.021	0.650	0.072	0.007
		11.5-12	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SB-26	3/18/11	1-1.5	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.015	0.010 U	0.010 U	0.010 U	0.011	0.014	0.010 U
		11.5-12	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
SB-27	3/18/11	1-1.5	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U
		11.5-12	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
Residential ESLs			3.3	3,600	--	2,400	--	18,000	0.16	15	0.016	0.16	1.6	--	1.60	60	85	0.016
Construction Worker ESLs			350	10,000	--	6,700	--	50,000	16	1,500	1.6	16	150	--	16	6,700	5,000	1.6

Notes:
Bolded Values exceed its respective screening level (human health shallow soil residential)
All results reported in micrograms per kilogram (mg/kg)
J= EPA Flag-Estimated Value
U= Constituent not detected at or above the indicated value
SG= Sampled Analyzed with Silica Gel Cleanup
Y= Atypical Pattern
~~7.8~~ =Sample location excavated from site

TABLE 2-3
SUMMARY OF SOIL ANALYTICAL RESULTS-METALS
1708 Wood Street
Oakland, California

Sample ID	Date	Depth (ft bgs)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Silver	Vanadium	Mercury	Zinc
Area 1-Northwestern UST Area (Soil)																
~~BM-7~~	~~12/10/07~~	~~6~~	~~3.2~~	~~34~~	~~1.0 U~~	~~1.0 U~~	~~50~~	~~8.0~~	~~23~~	~~9.6~~	~~1.4~~	~~37~~	~~1.0 U~~	~~41~~	~~0.050 U~~	~~61~~
BM-8	~~12/10/07~~	~~7~~	~~5.4~~	~~54~~	~~1.0 U~~	~~1.0 U~~	~~42~~	~~5.3~~	~~36~~	~~49~~	~~1.0 U~~	~~26~~	~~1.0 U~~	~~35~~	~~0.250~~	~~100~~
BM-9	~~12/10/07~~	~~5~~	~~2.8~~	~~94~~	~~1.0 U~~	~~1.0 U~~	~~31~~	~~7.7~~	~~28~~	~~22~~	~~1.0 U~~	~~25~~	~~1.0 U~~	~~33~~	~~0.050 U~~	~~70~~
SB-1	2/15/11	2.5-3	11	1,000	<0.38	3.3	206	10	270	**780**	<1.9	60	1.0	25	0.67	1,200
SB-2	~~2/15/11~~	~~2.5-3~~	~~4.8~~	~~77~~	~~<0.38~~	~~< 0.48~~	~~39~~	~~5.5~~	~~23~~	~~44~~	~~<1.9~~	~~31~~	~~<0.95~~	~~32~~	~~0.097~~	~~120~~
SB-3	~~2/15/11~~	~~--~~	~~4.4~~	~~21~~	~~< 0.42~~	~~< 0.53~~	~~40~~	~~5.0~~	~~16~~	~~18~~	~~< 2.1~~	~~31~~	~~< 1.1~~	~~29~~	~~0.037~~	~~48~~
WEST-W	10/31/11	16	--	--	--	0.9 U	51.8	--	--	5.6	--	49.2	--	--	--	44.5
WEST-E	~~10/31/11~~	~~16~~	~~--~~	~~--~~	~~--~~	~~0.9 U~~	~~49.9~~	~~--~~	~~--~~	~~5.0~~	~~--~~	~~45.3~~	~~--~~	~~--~~	~~--~~	~~41.0~~
EAST-W	~~10/31/11~~	~~15.5~~	~~--~~	~~--~~	~~--~~	~~0.9 U~~	~~49.6~~	~~--~~	~~--~~	~~5.3~~	~~--~~	~~47.9~~	~~--~~	~~--~~	~~--~~	~~43.8~~
EAST-E	~~10/31/11~~	~~16~~	~~--~~	~~--~~	~~--~~	~~0.9 U~~	~~46~~	~~--~~	~~--~~	~~3.9~~	~~--~~	~~37.0~~	~~--~~	~~--~~	~~--~~	~~35.7~~
SW1-E3	11/18/11	3	--	--	--	0.9 U	28.5	--	--	3.2	--	16.6	--	--	--	28
SW2-N5	11/18/11	5	--	--	--	0.9 U	52.4	--	--	7.4	--	61.2	--	--	--	56.1
SW3-W4B	11/18/11	4	--	--	--	0.9 U	50.6	--	--	5.8	--	54.1	--	--	--	50.8
SW4-W	11/18/11	3.5	--	--	--	0.9 U	42	--	--	**197**	--	44	--	--	--	180
Area 2-Central UST Basin/Oil Water Separator Area/Maintenance Shop																
BM-1	12/1/07	8	5.1	21	1.0 U	1.4	44	14	19	6	1.0 U	65	1.0 U	36	0.050 U	51
SB-9	~~3/18/11~~	~~1-1.5~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~**160**~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~
SB-9	~~3/18/11~~	~~7.5-8~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~4.3~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~
SB-11	~~2/16/11~~	~~2-2.5~~	~~7.8~~	~~76~~	~~0.4 U~~	~~1.1~~	~~39~~	~~7.7~~	~~36~~	~~**420**~~	~~2.1 U~~	~~44~~	~~1.0 U~~	~~17~~	~~0.270~~	~~210~~
SB-12	2/16/11	2-2.5	5.9	270	0.4 U	1.1	43	9.0	27	**1,300**	1.9 U	37	1.0 U	28	0.100	290
SB-13	2/16/11	1.5-2	4.3	110	0.4 U	0.5 U	45	5.8	22	**110**	2.1 U	32	1.1 U	34	0.043	100
SB-14	3/18/11	14.5-16	4.2 U	87	0.4 U	0.5 U	26	4.0	6.3 U	4.4	2.1 U	18	1.1 U	16	0.033	12
SB-20	3/18/11	1-1.5	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~50~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~
		11.5-12	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~6.7~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~	~~--~~

TABLE 2-3
SUMMARY OF SOIL ANALYTICAL RESULTS-METALS
1708 Wood Street
Oakland, California

Sample ID	Date	Depth (ft bgs)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Silver	Vanadium	Mercury	Zinc
SB-21	3/18/11	1-1.5	--	--	--	--	--	--	--	**14,000**	--	--	--	--	--	--
		3.5-4	--	--	--	--	--	--	--	**690**	--	--	--	--	--	--
SB-22	3/18/11	1-1.5	--	--	--	--	--	--	--	**4,800**	--	--	--	--	--	--
		7.5-8	--	--	--	--	--	--	--	6.6	--	--	--	--	--	--
SB-23	3/18/11	1-1.5	--	--	--	--	--	--	--	30	--	--	--	--	--	--
		7.5-8	--	--	--	--	--	--	--	6.4	--	--	--	--	--	--
OWS-1N	~~10/27/11~~	~~3~~	~~--~~	~~--~~	~~--~~	~~0.9 U~~	~~30~~	~~--~~	~~--~~	~~57~~	~~--~~	~~35~~	~~--~~	~~--~~	~~--~~	~~102~~
OWS-2NE	~~10/27/11~~	~~3~~	~~--~~	~~--~~	~~--~~	~~5.0~~	~~30~~	~~--~~	~~--~~	~~**171**~~	~~--~~	~~43~~	~~--~~	~~--~~	~~--~~	~~1710~~
OWS-3E	~~10/27/11~~	~~3~~	~~--~~	~~--~~	~~--~~	~~2.0~~	~~31~~	~~--~~	~~--~~	~~**412**~~	~~--~~	~~77~~	~~--~~	~~--~~	~~--~~	~~539~~
OWS-4S	~~10/27/11~~	~~3.5~~	~~--~~	~~--~~	~~--~~	~~0.9 U~~	~~30~~	~~--~~	~~--~~	~~**184**~~	~~--~~	~~37~~	~~--~~	~~--~~	~~--~~	~~155~~
OWS-5W	~~10/27/11~~	~~3~~	~~--~~	~~--~~	~~--~~	~~0.9 U~~	~~33~~	~~--~~	~~--~~	~~59~~	~~--~~	~~26~~	~~--~~	~~--~~	~~--~~	~~51~~
OWS-6F	~~10/27/11~~	~~4~~	~~--~~	~~--~~	~~--~~	~~1.0 U~~	~~45~~	~~--~~	~~--~~	~~70~~	~~--~~	~~27~~	~~--~~	~~--~~	~~--~~	~~99~~
OWS-11-A	~~10/27/11~~	~~3~~	~~--~~	~~--~~	~~--~~	~~1.0 U~~	~~44~~	~~--~~	~~--~~	~~4.7~~	~~--~~	~~22~~	~~--~~	~~--~~	~~--~~	~~32~~
OWS NEA	~~10/27/11~~	~~3~~	~~--~~	~~--~~	~~--~~	~~12~~	~~37~~	~~--~~	~~--~~	~~59~~	~~--~~	~~39~~	~~--~~	~~--~~	~~--~~	~~1990~~
OWSL 1	~~10/27/11~~	~~4~~	~~--~~	~~--~~	~~--~~	~~1.0 U~~	~~53~~	~~--~~	~~--~~	~~6.6~~	~~--~~	~~32~~	~~--~~	~~--~~	~~--~~	~~57~~
OWSL 2	~~10/27/11~~	~~3~~	~~--~~	~~--~~	~~--~~	~~0.9 U~~	~~51~~	~~--~~	~~--~~	~~28~~	~~--~~	~~41~~	~~--~~	~~--~~	~~--~~	~~100~~
OWSL 3	~~10/27/11~~	~~4~~	~~--~~	~~--~~	~~--~~	~~1.0 U~~	~~47~~	~~--~~	~~--~~	~~21~~	~~--~~	~~33~~	~~--~~	~~--~~	~~--~~	~~81~~
OWSL 4	~~10/27/11~~	~~2~~	~~--~~	~~--~~	~~--~~	~~1.0 U~~	~~40~~	~~--~~	~~--~~	~~54~~	~~--~~	~~43~~	~~--~~	~~--~~	~~--~~	~~85~~
Loading Dock Area																
SB-4	2/15/11	2-2.5	8.6	13	0.4 U	0.5 U	42	3.7	21	3.2	3.4	24	1.0 U	33	0.120	100
SB-5	2/15/11	2-2.5	5.0	34	0.4 U	0.5 U	48	5.1	26	8.5	<2.1	33	1.0 U	35	0.150	130
SB-6	2/15/11	2-2.5	3.8 U	85	0.4 U	0.5 U	49	4.4	18	19	<1.9	34	1.0 U	34	0.043	47
SB-7	2/16/11	2.5-3	4.5	120	0.4 U	0.5 U	81	10	23	15	<2.0	100	1.0 U	31	0.062	60
SB-8	2/17/11	1.5-2	3.9 U	160	0.4 U	0.5 U	59	7.7	14	10	<2.0	59	1.0 U	20	1.1	36

TABLE 2-3
SUMMARY OF SOIL ANALYTICAL RESULTS-METALS
1708 Wood Street
Oakland, California

Sample ID	Date	Depth (ft bgs)	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Silver	Vanadium	Mercury	Zinc
Eastern Side of Subject Property																
SB-15	2/16/11	2-2.5	2.0 U	110	0.4 U	0.5 U	46	7.5	28	**250**	2.0 U	34	1.0 U	28	0.380	100
SB-16	2/17/11	2-2.5	4.2	130	0.4 U	0.5 U	35	6.0	41	**340**	2.0 U	29	1.0 U	26	0.180	250
SB-24	3/18/11	1-1.5	--	--	--	--	--	--	--	**2,100**	--	--	--	--	--	--
		11.5-12	--	--	--	--	--	--	--	3.2	--	--	--	--	--	--
SB-25	3/18/11	1-1.5	--	--	--	--	--	--	--	**110**	--	--	--	--	--	--
		11.5-12	--	--	--	--	--	--	--	4.0	--	--	--	--	--	--
SB-26	3/18/11	1-1.5	--	--	--	--	--	--	--	**100**	--	--	--	--	--	--
		11.5-12	--	--	--	--	--	--	--	3.6	--	--	--	--	--	--
SB-27	3/18/11	1-1.5	--	--	--	--	--	--	--	**160**	--	--	--	--	--	--
		11.5-12	--	--	--	--	--	--	--	3.0	--	--	--	--	--	--
Residential ESLs			11	15,000	150	39	120,000	23	3,100	80	40	820	390	390	13	23,000
Construction Worker ESLs			11	3,000	42	39	530,000	28	14,000	160	1,800	86	1,800	470	44	110,000

Notes:
Bolded Values exceed its respective screening level (human health shallow soil residential)
All results reported in micrograms per kilogram (mg/kg)
J= EPA Flag-Estimated Value
U= Constituent not detected at or above the indicated value
SG= Sampled Analyzed with Silica Gel Cleanup
Y= Atypical Pattern
~~7.8~~ =Sample location excavated from site

TABLE 2-4
SUMMARY OF SOIL GAS ANALYTICAL RESULTS
1708 Wood Street
Oakland, California

Sample ID	Depth (feet)	Date	Dichlorodifluoromethane	Dichlorotetrafluoroethane	Chloroemethane	Chloroethene	Bromomethane	Chloroethane	Trichlorofluoro-methane	1,1-Dchloroethene	Trichlorotrifluoroethane	Methylene chloride	1,1-Dichloroethane	cis-1,2-Dichloroethene	Chloroform	1,1,1-Trichloroethane	Carbon Tetrachloride	1,2-Dichloroethane	Benzene	Trichloroethene	1,2-Dichloropropane
			(ug/m^3)																		
SG-1	1	12/14/16	49.5 U	69.9 U	20.7 U	25.6 U	38.8 U	26.4 U	56.2 U	39.7 U	76.6 U	34.7 U	40.5 U	39.7 U	48.8 U	40.5 U	62.9 U	40.5 U	31.9 U	53.7 U	46.2 U
SG-2	1	12/14/16	9.89 U	14 U	4.13 U	5.11 U	7.77 U	68.8	14.9	7.93 U	15.3 U	6.95 U	8.10 U	7.93 U	10.2	10.9 U	12.6 U	8.09 U	14.2	10.7 U	9.24 U
SG-3	1	12/14/16	4.95 U	6.99 U	2.07 U	2.56 U	3.88 U	2.64 U	5.62 U	4.05 U	7.66 U	3.47 U	4.05 U	3.97 U	13.7	5.46 U	6.29 U	4.05 U	15.1	5.37 U	4.62 U
SG-4	1	12/14/16	198 U	280 U	82.6 U	102 U	155 U	106 U	225 U	159 U	225 U	139 U	162 U	159 U	195 U	218 U	252 U	162 U	128 U	215 U	185 U
Residential ESLs			--	--	47,000	4.7	2,600	5.2E+06	--	37,000	--	510	880	4,200	61	5.2E+05	33	54	48	240	140

Notes:
$\mu g/m^3$: micrograms per meter cubed
U: Constituent not detected at or above the indicated value
--: not available
ESLs: California Regional Water Quality Control Board - San Franicsco Bay Region Environmental Screening Levels (Rev. 3)
a: CalEPA Recommended Action Level for Methane, 2005

TABLE 2-4
SUMMARY OF SOIL GAS ANALYTICAL RESULTS
1708 Wood Street
Oakland, California

Sample ID	Depth (feet)	Date	Toluene	cis-1,3-Dichloropropene	1,1,2-Tetrachloroethane	Tetrachloroethene	1,2-Dibromoethane	Chlorobenzene	Ethyl Benzene	Xylenes	Styrene	1,1,2,2-Tetrachloroethane	1,3,5-Trimethylbenzene	1,2,4-Trimethylbenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	1,2-Dichlorobenzene	1,2,4-Trichlorobenzene	Hexachlorobutadiene	Methane	Helium
			(ug/m^3)																	(ppmv)	(%)
SG-1	1	12/14/16	37.7 U	45.4 U	54.6 U	67.8 U	76.8 U	46.0 U	43.4 U	86.8 U	42.6 U	68.7 U	49.2 U	49.2 U	60.1 U	60.1 U	60.1 U	74.2 U	107 U	134,000	0.318
SG-2	1	12/14/16	13.9	9.08 U	10.9 U	13.6 U	15.4 U	9.21 U	8.68 U	17.4 U	8.52 U	13.7 U	9.83 U	22.5	12 U	12 U	12 U	14.8 U	21.3 U	30.1	1.81
SG-3	1	12/14/16	5.88	4.54 U	5.46 U	6.78 U	7.68 U	4.60 U	4.34 U	4.34 U	4.26 U	6.87 U	4.92 U	4.92 U	6.01 U	6.01 U	6.01 U	7.42 U	10.7 U	32.6	0.932
SG-4	1	12/14/16	218 U	182 U	218 U	271 U	307 U	184 U	174 U	347 U	170 U	275 U	202	201	241 U	241 U	241 U	297 U	427 U	212	0.688
Residential ESLs			1.6E+05	88	88	240	2.3	26,000	560	5.2E+04	4.7E+05	24	--	--	--	130	1.0E+05	1,000	--	5,000[a]	--

Notes:
$\mu g/m^3$: micrograms per meter cubed
U: Constituent not detected at or above the indicated value
--: not available
ESLs: California Regional Water Quality Control Board - San Franicsco Bay Region Environmental Screening Levels (Rev. 3)
a: CalEPA Recommended Action Level for Methane, 2005

TABLE 2-5
SUMMARY OF SHALLOW GROUNDWATER ANALYTICAL RESULTS-TPH, VOCS, CHLORIDE and PCBs
1708 Wood Street
Oakland, California

Sample ID	Date	TPHg	TPHd	TPHmo	Total Oil & Grease	Benzene	Toluene	Ethyl benzene	Total Xylenes	MTBE	DIPE	PCE	Chloride	PCBs
Area 1- Northwestern UST Basin														
BM-7	12/10/07	50 U	120 Y	--	5,000 U	--	--	--	--	--	--	--	--	--
BM-8	12/10/07	54,000	61,000	--	430,000	--	--	--	--	--	--	--	--	--
BM-9	12/10/07	180	1,200	--	5,000 U	--	--	--	--	--	--	--	--	--
SB-1	2/15/11	50 U	700	760	7,400 U	0.5 U	0.5 U	0.5 U	1.0 U	0.5 U	0.5 U	0.5 U	380,000	0.56 U
SB-2	2/15/11	50 U	3,400	2,600	6,500	0.5 U	0.5 U	0.5 U	1.0 U	0.5 U	0.5 U	0.5 U	35,000	0.68 U
SB-3	2/15/11	--	690	2,400	28,000 U	--	--	--	--	--	--	--	--	--
Etank Grab	10/31/11	182	2,180	368 J	--	1.0 U	1.0 U	0.74 J	2.0 U	1.0 U	--	--	--	--
Wtank Grab	10/31/11	598	2,250	271 J	--	5	111	11	62	2.0 U	--	--	--	--
Area 2-Central UST Basin/Oil Water Seperator Area/Maintenance Shop														
B-1	7/24/97	50 U	50 U	--	500 U	--	--	--	--	--	--	--	--	--
B-3	7/24/97	50 U	500	--	540	--	--	--	--	--	--	--	--	--
B-4	7/24/97	50 U	560	--	500 U	--	--	--	--	--	--	--	--	--
B-5	7/24/97	50 U	50 U	--	500 U	--	--	--	--	--	--	--	--	--
B-6	7/24/97	50 U	2,000	--	690	--	--	--	--	--	--	--	--	--
B-7	7/24/97	840	120,000	--	8,800	--	--	--	--	--	--	--	--	--
B-8	7/24/97	50 U	2,000	--	610	--	--	--	--	--	--	--	--	--
BM-1	12/10/07	--	--	--	--	--	--	--	--	--	--	--	--	--
BM-2	12/10/07	260	28,000	1,500	5.0 U	--	--	--	--	--	--	--	--	--
BM-3	12/10/07	50 U	--	--	--	--	--	--	--	--	--	--	--	--
BM-4	12/10/07	50 U	620 U	9900	5,000 U	--	--	--	--	--	--	--	--	--
BM-5	12/10/07	50 U	--	--	--	--	--	--	--	--	--	--	--	--
BM-6	12/10/07	50 U	--	--	--	--	--	--	--	--	--	--	--	--
BM-10-S	8/4/08	50 U	50 U	300 U SG	--	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	--	--	--	--
BM-11-S	8/4/08	50 U	50 U	300 U SG	--	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	--	--	--	--
MW-2	8/4/08	50 U	50 U	300 U SG	--	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	--	--	--	--
BM-12-S	8/5/08	50 U	50 U	300 U SG	--	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	--	--	--	--
BM-15-S	8/5/08	50 U	50 U	300 U SG	--	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	--	--	--	--

TABLE 2-5
SUMMARY OF SHALLOW GROUNDWATER ANALYTICAL RESULTS-TPH, VOCS, CHLORIDE and PCBs
1708 Wood Street
Oakland, California

Sample ID	Date	TPHg	TPHd	TPHmo	Total Oil & Grease	Benzene	Toluene	Ethyl benzene	Total Xylenes	MTBE	DIPE	PCE	Chloride	PCBs
MW-1	2/14/11	50 U	1,200	--	1,400	--	--	--	--	--	--	--	--	--
MW-6	2/14/11	50 U	51 U	130	5,100 U	--	--	--	--	--	--	0.5 U	--	--
MW-7	2/14/11	50 U	51 U	100 U	5,200 U	--	--	--	--	--	--	0.5 U	--	--
MW-8	2/14/11	50 U	52 U	100 U	5,200 U	--	--	--	--	--	--	0.5 U	--	--
SB-10	2/16/11	50 U	2,300	1,400	7,000	0.50 U	0.50 U	0.50 U	1.0 U	0.5 U	0.5 U	0.5 U	--	--
SB-11	2/16/11	240	19,000	6,900	48,000	0.5 U	0.5 U	0.5 U	1.0 U	0.6	0.6	0.05 U	--	--
CO Water	10/31/11	50 U	2,990	1,970	--	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	--	--	--	--
CO Water-2	10/31/11	94.1	758	< 200	--	1.0 U	1.0 U	1.0 U	2.0 U	1.0 U	--	--	--	--
OWS-GW	10/31/11	50 U	197	< 200	--	1.0 U	1.0 U	1.0 U	2.0 U	0.87 J	--	--	--	--
Loading Dock Area														
SB-4	2/15/11	--	650	550	--	0.50 U	0.50 U	0.50 U	1.0 U	0.5 U	0.5 U	0.05 U	--	--
SB-6	2/16/11	50 U	940	690	--	0.50 U	0.50 U	0.50 U	1.0 U	50 U	0.5 U	0.5 U	--	--
SB-7	2/17/11	50 U	490	510	--	0.50 U	0.50 U	0.50 U	1.0 U	50 U	0.5 U	0.5 U	--	--
Eastern Side of Subject Property														
SB-16	2/17/11	50 U	1,100	1,600	--	0.50 U	0.50 U	0.50 U	1.0 U	2.8	0.5 U	0.5 U	--	--
SB-17	2/17/11	50 U	230	330	--	0.50 U	0.50 U	0.50 U	1.0 U	50 U	0.5 U	1.9	--	--
SB-18	2/17/11	50 U	3,100	2,200	--	0.50 U	0.50 U	0.50 U	1.0 U	50 U	0.5 U	0.5 U	--	--

Notes:

All results reported in micrograms per kilogram (µg/l)

Y= Atypical Pattern

SG= Silica Gel Cleanup run on sample

U= Constituent not detected at or above the indicated value

TABLE 2-6
SUMMARY OF SHALLOW GROUNDWATER ANALYTICAL RESULTS-PAHS
1708 Wood Street
Oakland, California

Sample ID	Date	Naphthalene	Phenanthrene	Anthracene	Benzo[a]anthracene	Chrysene	Benzo[a]pyrene	Benzo[b]fluoranthene	Benzo[k] fluoranthene	Benzo[g, h, i] perylene	Indeno[1, 2, 3-cd]pyrene	Fluoranthene	Pyrene	Dibenz(a, h)anthracene
Area 1- Northwestern UST Basin														
SB-1	2/15/11	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
SB-2	2/15/11	1.0	7.7	1.8	2.20	2.5	2.5	1.6	1.8	1.5	1.3	5.5	6.3	0.29
SB-3	2/15/11	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U	3.0 U
Loading Dock Area														
SB-4	2/15/11	2.4 U	0.25	< 2.4	0.20	0.21	0.22	0.26	0.14	0.17	0.10	0.32	0.44	2.4 U
SB-6	2/16/11	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U	1.2 U
SB-7	2/17/11	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Eastern Side of Subject Property														
SB-16	2/17/11	0.17	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
SB-17	2/17/11	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.20	0.1 U	0.14	0.17	0.1 U
SB-18	2/17/11	0.24	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Notes:
All results reported in micrograms per liter (µg/l)
Y= Atypical Pattern
SG= Silica Gel Cleanup run on sample
U= Constituent not detected at or above the indicated value

TABLE 2-7
SUMMARY OF SHALLOW GROUNDWATER ANALYTICAL RESULTS-METALS
1708 Wood Street
Oakland, California

Sample ID	Date	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Silver	Vanadium	Mercury	Zinc
Area 1- Northwestern UST Basin															
BM-7	12/10/07	31	270	5 U	2.0 U	270	42	100	83	--	220	220	230	0.2 U	260
BM-8	12/10/07	11	94	5 U	2.0 U	110	15	45	30	--	750	--	90	0.2 U	87
BM-9	12/10/07	72	2,400	5 U	7	640	170	640	860	--	500	--	580	0.2 U	1,500
SB-1	2/15/11	130	130	2.0 U	2.5 U	10 U	2.0 U	20 U	5.0 U	--	10 U	--	10 U	0.2 U	56
SB-2	2/15/11	10 U	65	2.0 U	2.5 U	10 U	2.4	20 U	5.0 U	--	10 U	--	10 U	0.2 U	25
Etank Grab	10/31/11	--	--	--	2.0 U	55	--	--	38	--	60	--	--	--	167
Wtank Grab	10/31/11	--	--	--	15	886	--	--	2,050	--	1,010	--	--	--	3,070
Area 2-Central UST Basin/Oil Water Seperator Area/Maintenance Shop															
BM-1	12/10/07	5	21	5.0 U	1.4	44	14	19	6	5.0 U	65	5.0 U	36	0.2 U	51
SB-10	2/16/11	10 U	460	2.9	2.5 U	10 U	4	20 U	5.0 U	14	11	--	10 U	0.2 U	22
SB-11	2/16/11	10 U	240	2.0 U	2.5 U	10 U	2.0 U	20 U	5.0 U	10 U	68	--	10 U	0.2 U	26
OWS-GW	10/31/11	--	--	--	2.0 U	10 U	--	--	121	--	52	--	--	--	121
CO Water	10/31/11	--	--	--	2.0 U	13	--	--	80	--	19	--	--	--	102
CO Water-2	10/31/11	--	--	--	2.0 U	80	--	--	311	--	54	--	--	--	388
Loading Dock Building															
SB-4	2/15/11	10 U	77	2.0 U	2.5 U	10 U	2.0 U	20 U	5.0 U	10 U	10 U	--	10 U	0.2 U	20 U
SB-6	2/16/11	10 U	110	2.0 U	2.5 U	10 U	2.0 U	20 U	5.0 U	10 U	10 U	--	10 U	0.2 U	31
SB-7	2/17/11	10 U	53	2.0 U	2.5 U	10 U	2.0 U	20 U	5.0 U	10 U	10 U	--	10	0.2 U	20 U
Eastern Side of Subject Property															
SB-16	2/17/11	11	110	2.0 U	2.5 U	10 U	2.0 U	20 U	5.0 U	10 U	10 U	--	10 U	0.2 U	27
SB-17	2/17/11	10 U	240	2.0 U	2.5 U	88	18	70	100	10 U	59	--	76	0.29	240
SB-18	2/17/11	10 U	36	2.0 U	2.5 U	10 U	2.0 U	20 U	5.0 U	10 U	10 U	--	10 U	0.2 U	20 U

Notes:

All results reported in micrograms per kilogram (µg/l)

Y= Atypical Pattern

U= Constituent not detected at or above the indicated value

TABLE 2-8
SUMMARY OF DEEP GROUNDWATER ANALYTICAL RESULTS-TPH and VOCs
1708 Wood Street
Oakland, California

Sample ID	Date	TPHg	TPHd	TPHmo	Total Oil & Grease	Benzene	Toluene	Ethyl benzene	Total Xylenes	MTBE	DIPE	PCE
Area 2-Central UST Basin/Oil Water Seperator Area/Maintenance Shop												
BM-10-D	8/4/08	50 U	50 U	300 U	--	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	--	--
BM-11-D	8/4/08	50 U	50 U SG	300 U	--	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	--	--
BM-12-D	8/4/08	50 U	50 U SG	300 U	--	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	--	--
BM-13-O	8/4/08	50 U	50 U SG	300 U	--	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	--	--
BM-14-O	8/4/08	50 U	50 U	300 U	--	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	--	--
BM-15-D	8/4/08	50 U	50 U SG	300 U	--	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	--	--
BM-16-O	8/4/08	50 U b	50 U b	300 U b	--	0.50 U b	0.50 U b	0.50 U b	0.50 U b	2.0 U b	--	--
BM-17-O	8/4/08	50 U	50 U SG	300 U	--	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	--	--
BM-18-O	8/4/08	50 U	50 U	300 U	--	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	--	--
BM-19-O	8/4/08	50 U	50 U	300 U	--	0.50 U	0.50 U	0.50 U	0.50 U	2.0 U	--	--
MW-3	2/14/11	50 U	51 U	100 U	5,200 U	0.50 U	0.50 U	0.50 U	1.00 U	0.50 U	0.50 U	0.50 U
MW-4	2/14/11	50 U	51 U	100 U	5,200 U	0.50 U	0.50 U	0.50 U	1.00 U	0.50 U	0.50 U	0.50 U
MW-5	2/14/11	50 U	51 U	100 U	5,200 U	0.50 U	0.50 U	0.50 U	1.00 U	0.50 U	0.8	0.50 U

Notes:

All results reported in micrograms per kilogram (µg/l)

Y= Atypical Pattern

SG= Silica Gel Cleanup run on sample

b = Analyzed outside of hold time

U= Constituent not detected at or above the indicated value

FIGURES

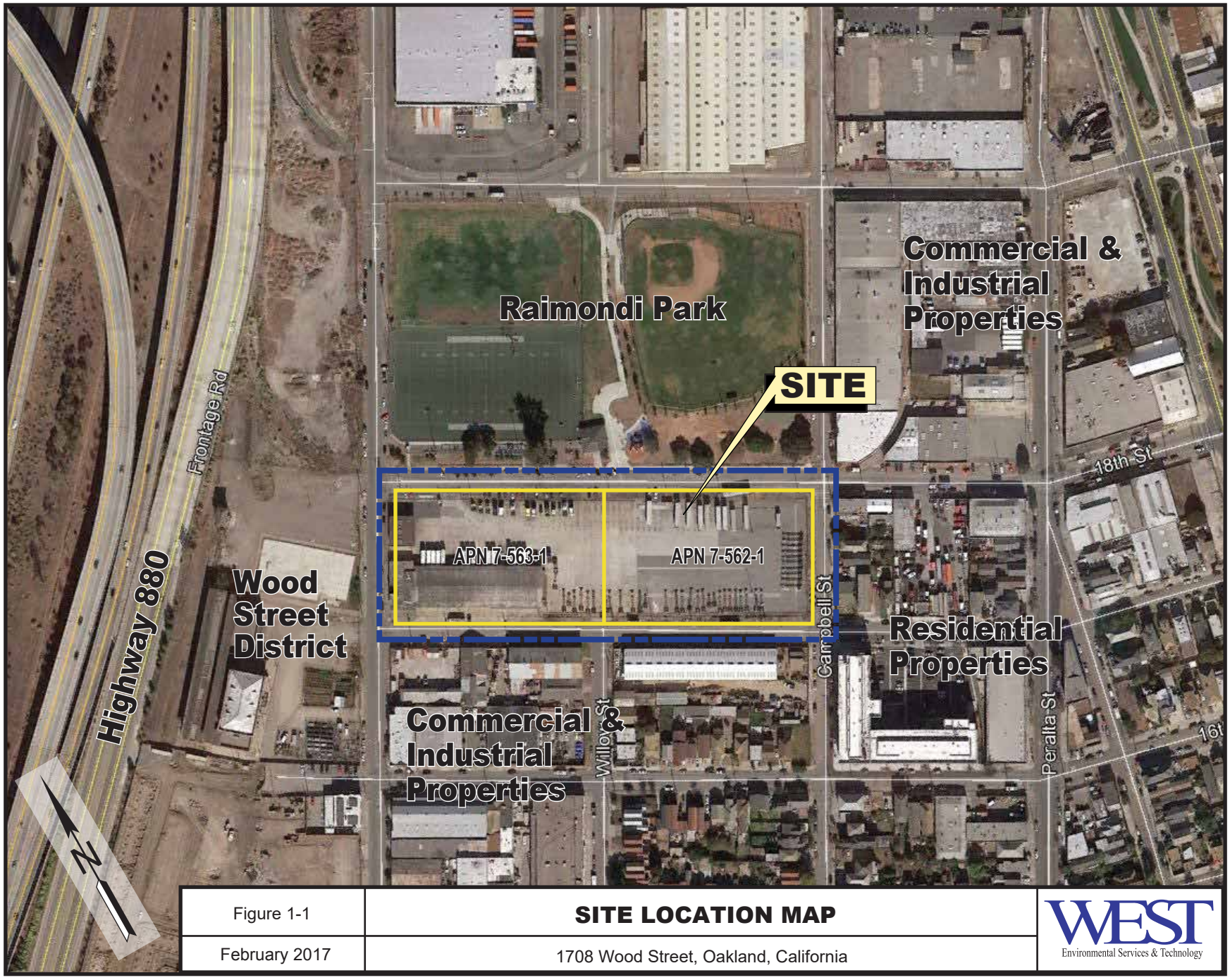


Figure 1-1	**SITE LOCATION MAP**	WEST Environmental Services & Technology
February 2017	1708 Wood Street, Oakland, California	

LEGEND

- Cross Section Profile
- Area of Interest
- Approximate Location of Former Oil-Water Separator
- Former Maintenance Shed/Chemical Storage
- Approximate Location of Abandoned UST
- SB-1 to SB-8 — Boring Location (Groundwater Technology, 1987)
- B-1 to B-8 — Boring Location (BCON, 1997)
- BM-1 to BM-9 — Boring Location (B&M, 2007)
- BM-10 to BM-19 — Boring Location (B&M, 2008)
- SB-1 to SB-27 — Boring Location (ACC, 2011)
- SG-1 to SG-4 — Soil Gas Sample Locations (WEST, 2016)
- MW-1 to MW-2 — Monitoring Well Location (R.S. Egan, 1987; Destroyed 2008)
- MW-3 to MW-5 — Monitoring Well Location (R.S. Egan, 1987; Destroyed 2008)
- MW-6 to MW-8 — Shallow Monitoring Well Location (B&M, 2009; Destroyed 2015)

Notes:
All locations approximate Taken from ACC Environmental. Consultants sample location figure (2/6/2011).
Only samples along the cross-section displayed here.

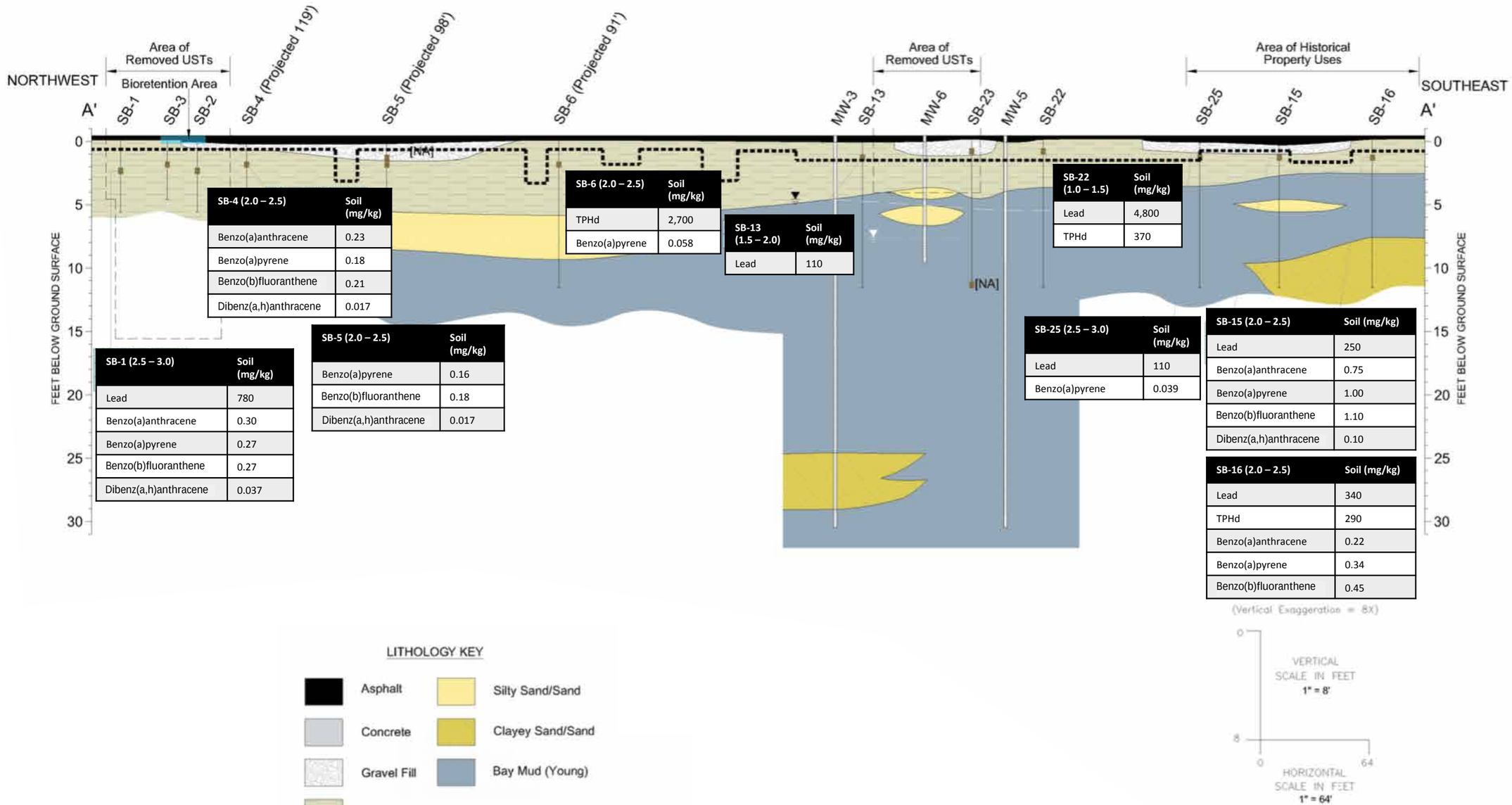
SITE PLAN

1708 Wood Street
Oakland, California

WEST Environmental Services & Technology

Figure 2-1

February 2017



SB-4 (2.0 – 2.5)	Soil (mg/kg)
Benzo(a)anthracene	0.23
Benzo(a)pyrene	0.18
Benzo(b)fluoranthene	0.21
Dibenz(a,h)anthracene	0.017

SB-6 (2.0 – 2.5)	Soil (mg/kg)
TPHd	2,700
Benzo(a)pyrene	0.058

SB-13 (1.5 – 2.0)	Soil (mg/kg)
Lead	110

SB-22 (1.0 – 1.5)	Soil (mg/kg)
Lead	4,800
TPHd	370

SB-1 (2.5 – 3.0)	Soil (mg/kg)
Lead	780
Benzo(a)anthracene	0.30
Benzo(a)pyrene	0.27
Benzo(b)fluoranthene	0.27
Dibenz(a,h)anthracene	0.037

SB-5 (2.0 – 2.5)	Soil (mg/kg)
Benzo(a)pyrene	0.16
Benzo(b)fluoranthene	0.18
Dibenz(a,h)anthracene	0.017

SB-25 (2.5 – 3.0)	Soil (mg/kg)
Lead	110
Benzo(a)pyrene	0.039

SB-15 (2.0 – 2.5)	Soil (mg/kg)
Lead	250
Benzo(a)anthracene	0.75
Benzo(a)pyrene	1.00
Benzo(b)fluoranthene	1.10
Dibenz(a,h)anthracene	0.10

SB-16 (2.0 – 2.5)	Soil (mg/kg)
Lead	340
TPHd	290
Benzo(a)anthracene	0.22
Benzo(a)pyrene	0.34
Benzo(b)fluoranthene	0.45

(Vertical Exaggeration = 8X)

VERTICAL SCALE IN FEET
1" = 8'

HORIZONTAL SCALE IN FEET
1" = 64'

LITHOLOGY KEY

- Asphalt
- Concrete
- Gravel Fill
- Clayey Fill
- Silty Sand/Sand
- Clayey Sand/Sand
- Bay Mud (Young)

/18/09

3/09

Extent of Excavation

UST Underground Storage Tank

▪▪▪▪▪▪▪▪▪▪▪▪▪ Approximate Depth and Location of Proposed Paver Roadway Sections
▪▪▪▪▪▪▪▪▪▪▪▪▪ Approximate Depth and Location of Proposed Over-excavation Areas/Planter Areas
▪▪▪▪▪▪▪▪▪▪▪▪▪ Approximate Depth and Location of Proposed Building Slabs

Grafcon, 2016

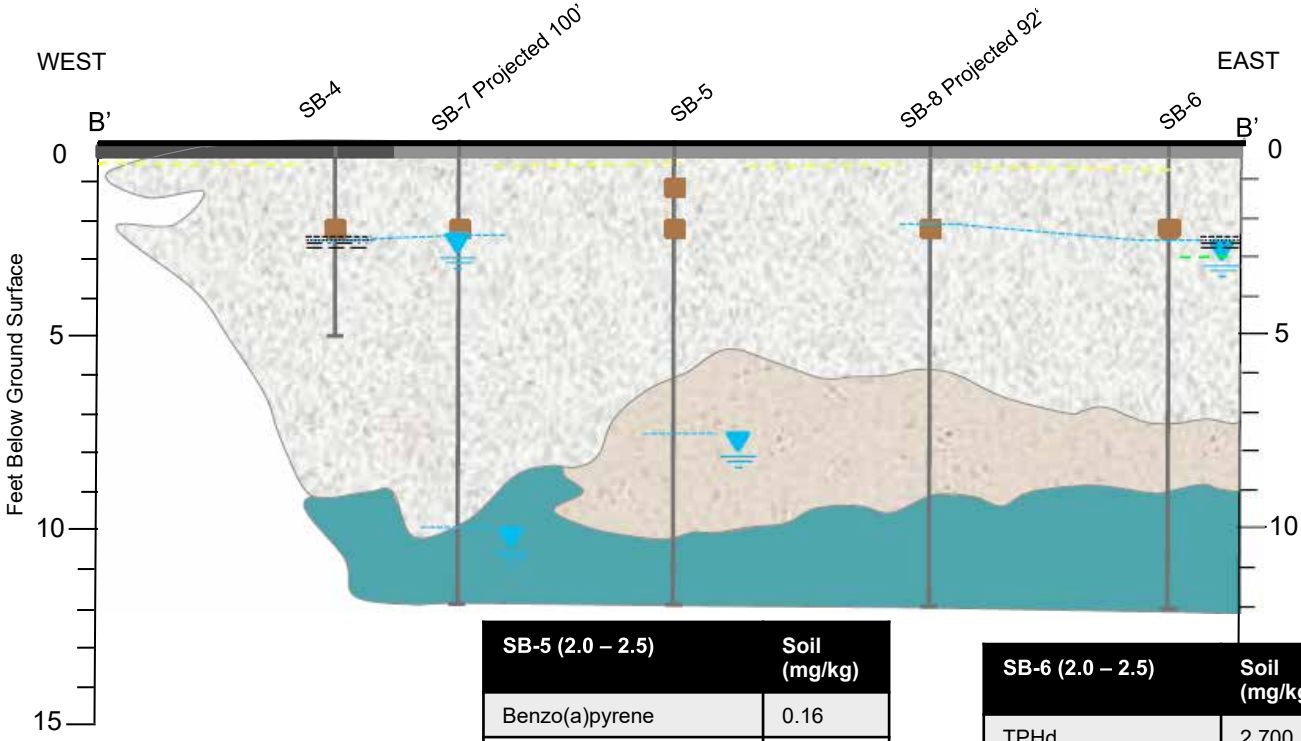
Figure 2-2

GEOLOGIC CROSS-SECTION A-A'

February 2017

1708 Wood Street, Oakland, California

WEST Environmental Services & Technology



LITHOLOGY KEY

- Clayey/Clayey Fill
- Clayey Sand/Sand
- Clay/Bay Mud

LEGEND

- Concrete
- Asphalt
- Soil Sample Interval
- Utility Location
- Depth to water 2011

Approximate depth and location of base of proposed building slabs

Approximate depth and location of proposed utilities

SB-4 (2.0 – 2.5)	Soil (mg/kg)
Benzo(a)anthracene	0.23
Benzo(a)pyrene	0.18
Benzo(b)fluoranthene	0.21
Dibenz(a,h)anthracene	0.017

SB-5 (2.0 – 2.5)	Soil (mg/kg)
Benzo(a)pyrene	0.16
Benzo(b)fluoranthene	0.18
Dibenz(a,h)anthracene	0.017

SB-6 (2.0 – 2.5)	Soil (mg/kg)
TPHd	2,700
Benzo(a)pyrene	0.058

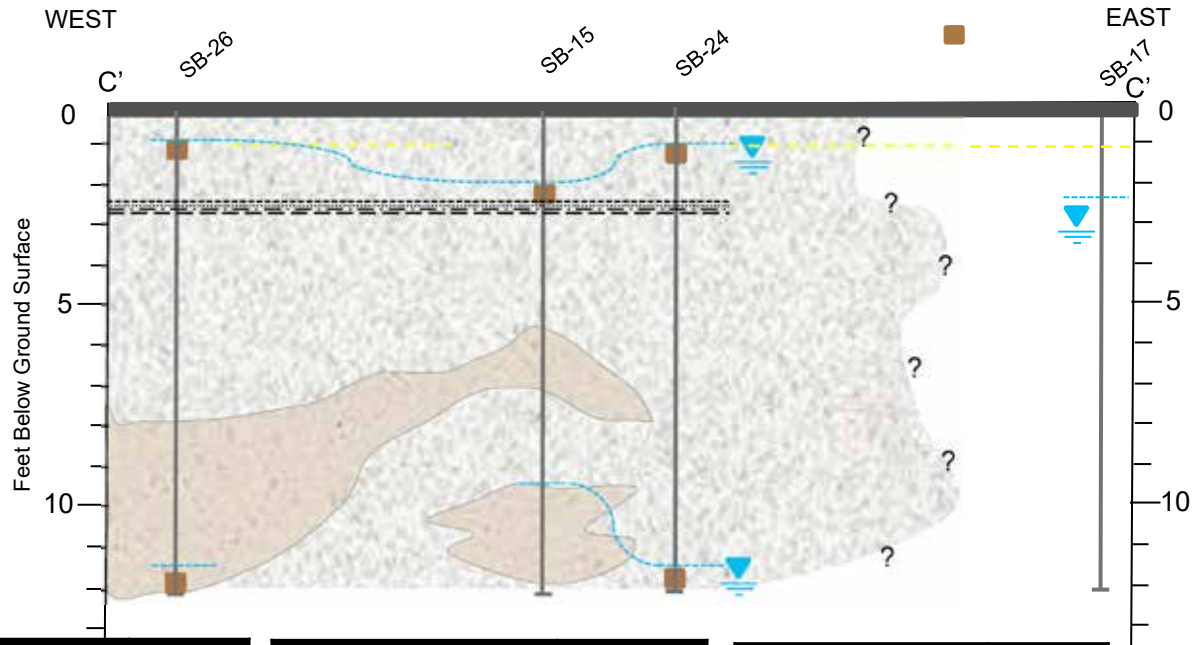
SB-8 (1.5 – 2.0)	Soil (mg/kg)
TPHd	2,400
Benzo(a)anthracene	0.45
Benzo(a)pyrene	0.35
Benzo(b)fluoranthene	0.45

TPHd	Total Petroleum Hydrocarbons as Diesel
B(a)P	Benzo(a)pyrene
ug/L	Micrograms per Liter
mg/kg	Milligrams per Kilogram

Vertical Scale in feet 1'=5'
Horizontal Scale in feet 1'=50'

Grafcon, 2016

Figure 2-3	**GEOLOGIC CROSS-SECTION B-B'**	WEST Environmental Services & Technology
February 2017	1708 Wood Street, Oakland, California	



LITHOLOGY KEY

- Clayey/Clayey Fill
- Clayey Sand/Sand

LEGEND

- Concrete
- Asphalt
- Soil Sample Interval
- Utility Location
- Depth to water 2011
- Approximate depth and location of base of proposed building slabs
- Approximate depth and location of proposed utilities

SB-26 (1.0 – 1.5)	Soil (mg/kg)
Lead	100

SB-15 (2.0 – 2.5)	Soil (mg/kg)
Lead	250
Benzo(a)anthracene	0.75
Benzo(a)pyrene	1.00
Benzo(b)fluoranthene	1.10
Dibenz(a,h)anthracene	0.10

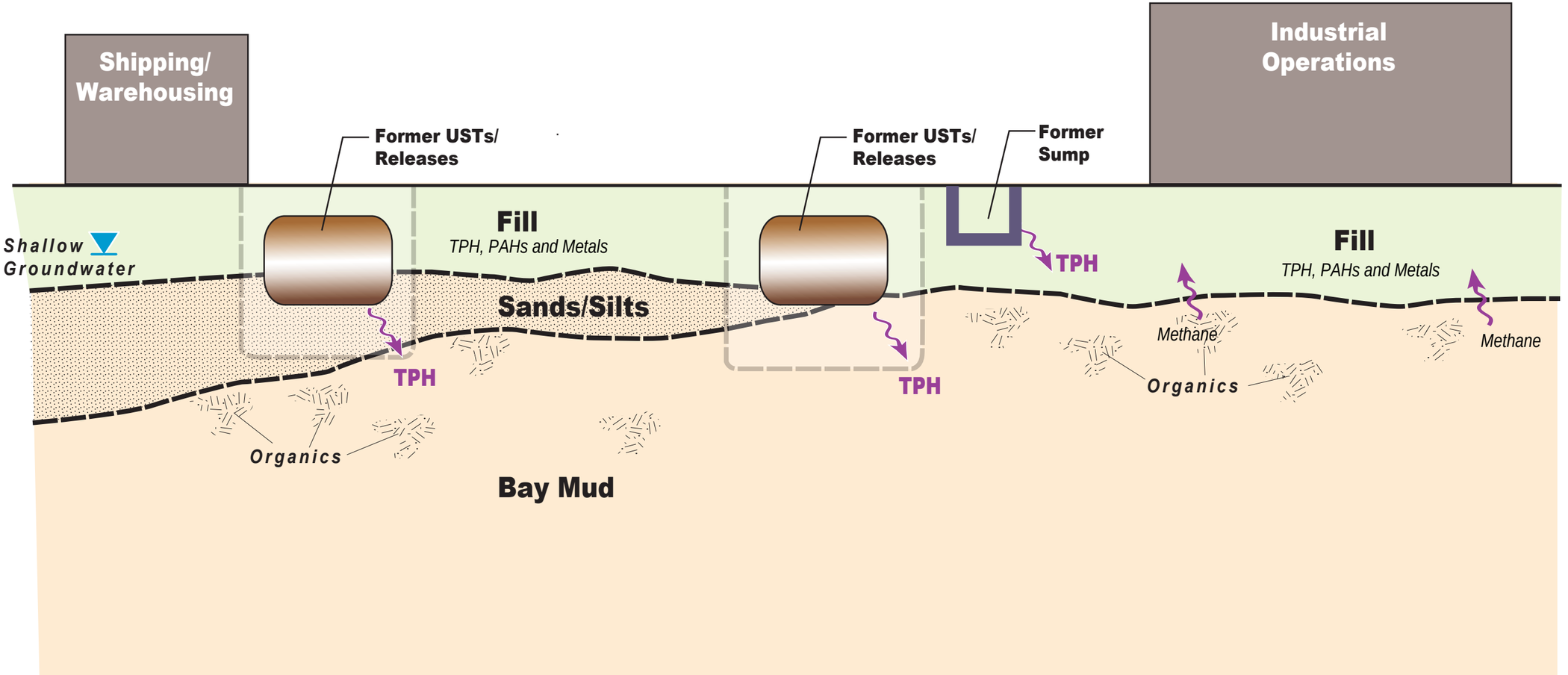
SB-24 (1.0 – 1.5)	Soil (mg/kg)
Lead	2,100
Benzo(a)anthracene	0.38
Benzo(a)pyrene	0.48
Benzo(b)fluoranthene	0.54

TPHd	Total Petroleum Hydrocarbons as Diesel
B(a)P	Benzo(a)pyrene
mg/kg	Milligrams per Kilogram

Vertical Scale in feet 1'=5'
Horizontal Scale in feet 1'=50'

Grafcon, 2016

Figure 2-4	**GEOLOGIC CROSS-SECTION C-C'**	WEST Environmental Services & Technology
February 2017	1708 Wood Street, Oakland, California	



CONCEPTUAL SITE MODEL

1708 Wood Street
Oakland, California

WEST Environmental Services & Technology

Figure 3-1

February 2017

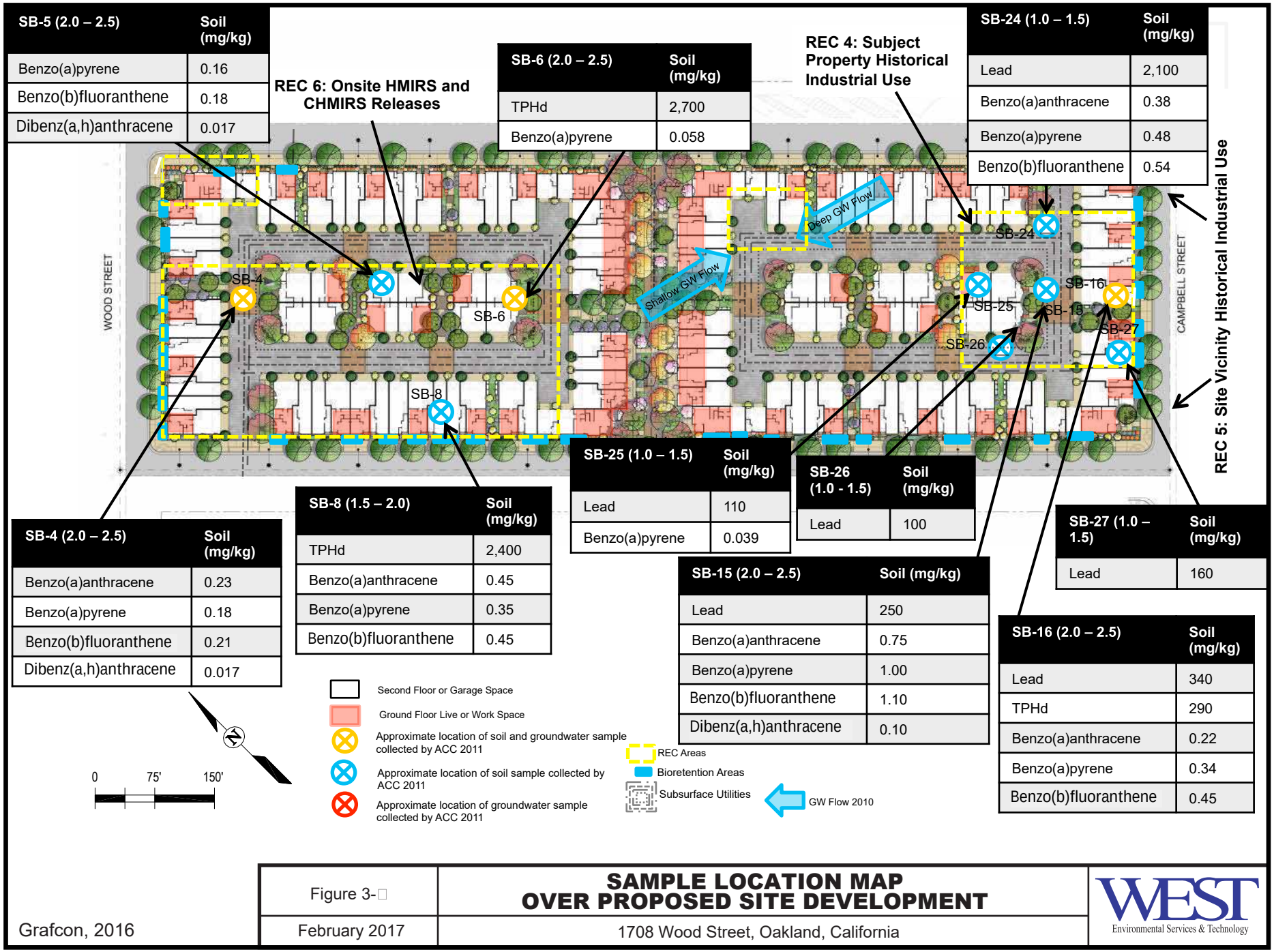


Figure 3-□

SAMPLE LOCATION MAP OVER PROPOSED SITE DEVELOPMENT

1708 Wood Street, Oakland, California

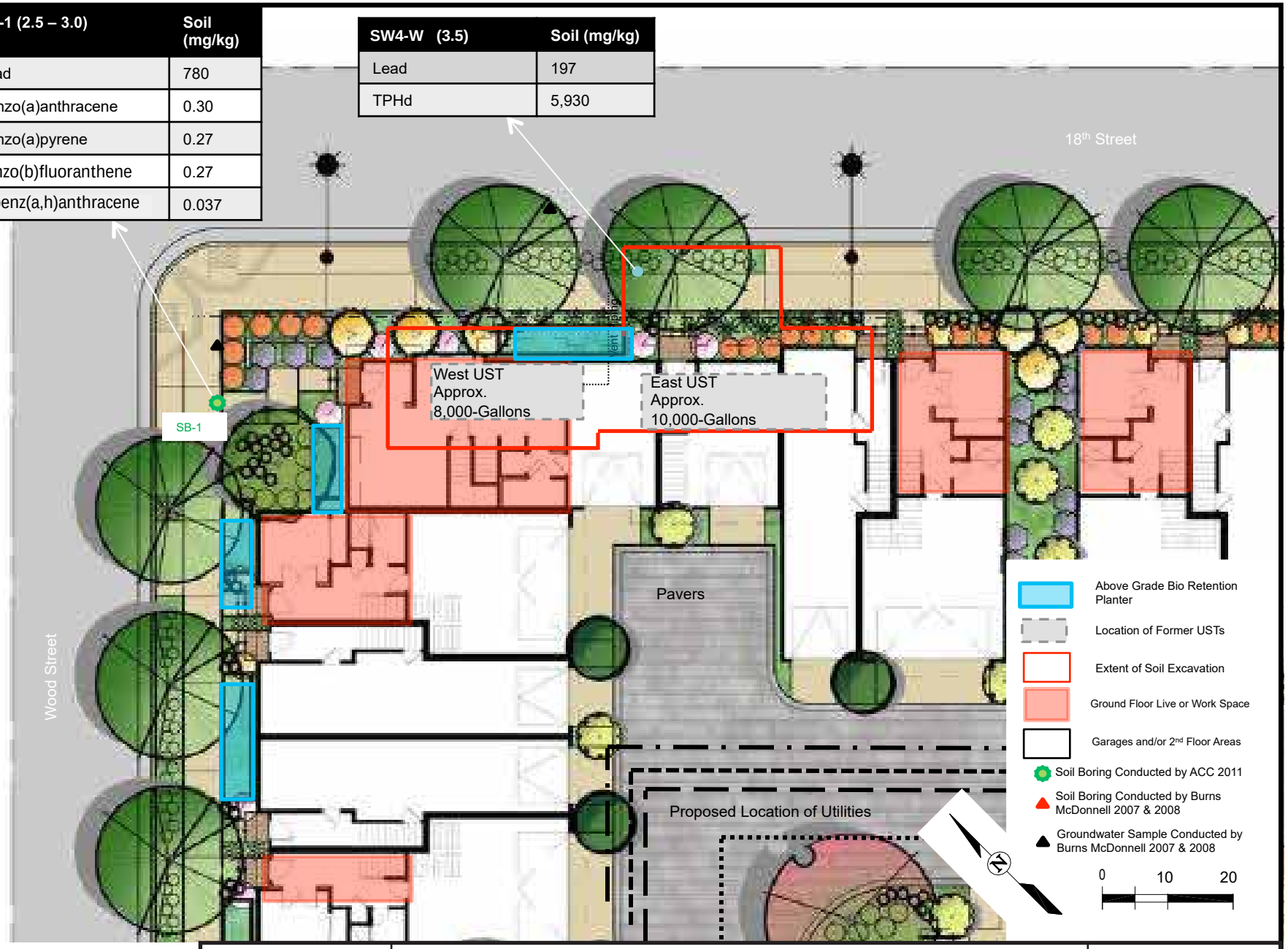
February 2017

Grafcon, 2016

WEST Environmental Services & Technology

SB-1 (2.5 – 3.0)	Soil (mg/kg)
Lead	780
Benzo(a)anthracene	0.30
Benzo(a)pyrene	0.27
Benzo(b)fluoranthene	0.27
Dibenz(a,h)anthracene	0.037

SW4-W (3.5)	Soil (mg/kg)
Lead	197
TPHd	5,930



Grafcon, 2016

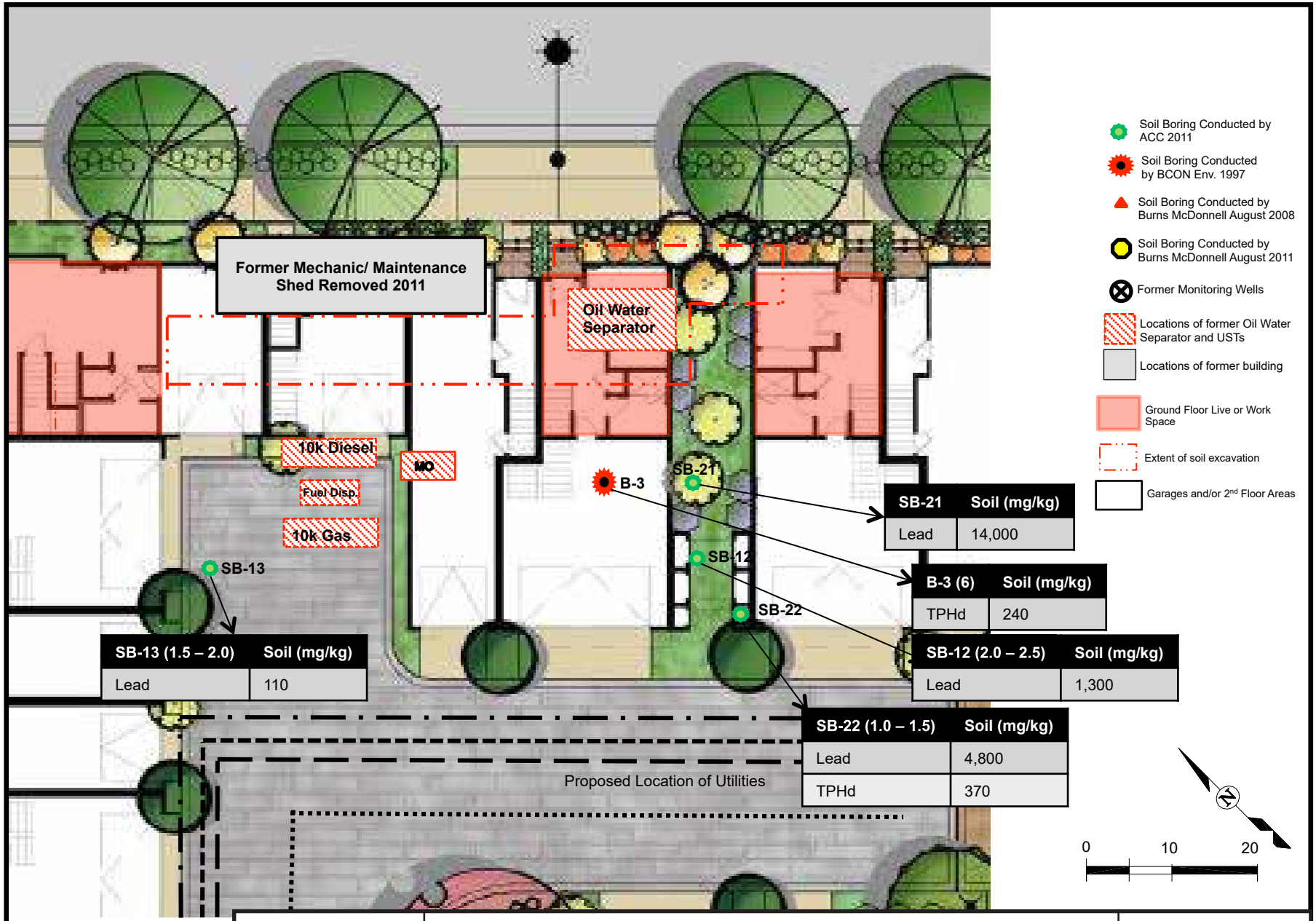
Figure 3-3

February 2017

AREA 1-NORTHWEST UST BASIN-PROPOSEDSITE DEVELOPMENT

1708 Wood Street, Oakland, California

WEST Environmental Services & Technology



Grafcon, 2016

Figure 3-□

AREA 2-CENTRAL UST BASIN

February 2017

1708 Wood Street, Oakland, California

WEST Environmental Services & Technology

0 15 30 60 90

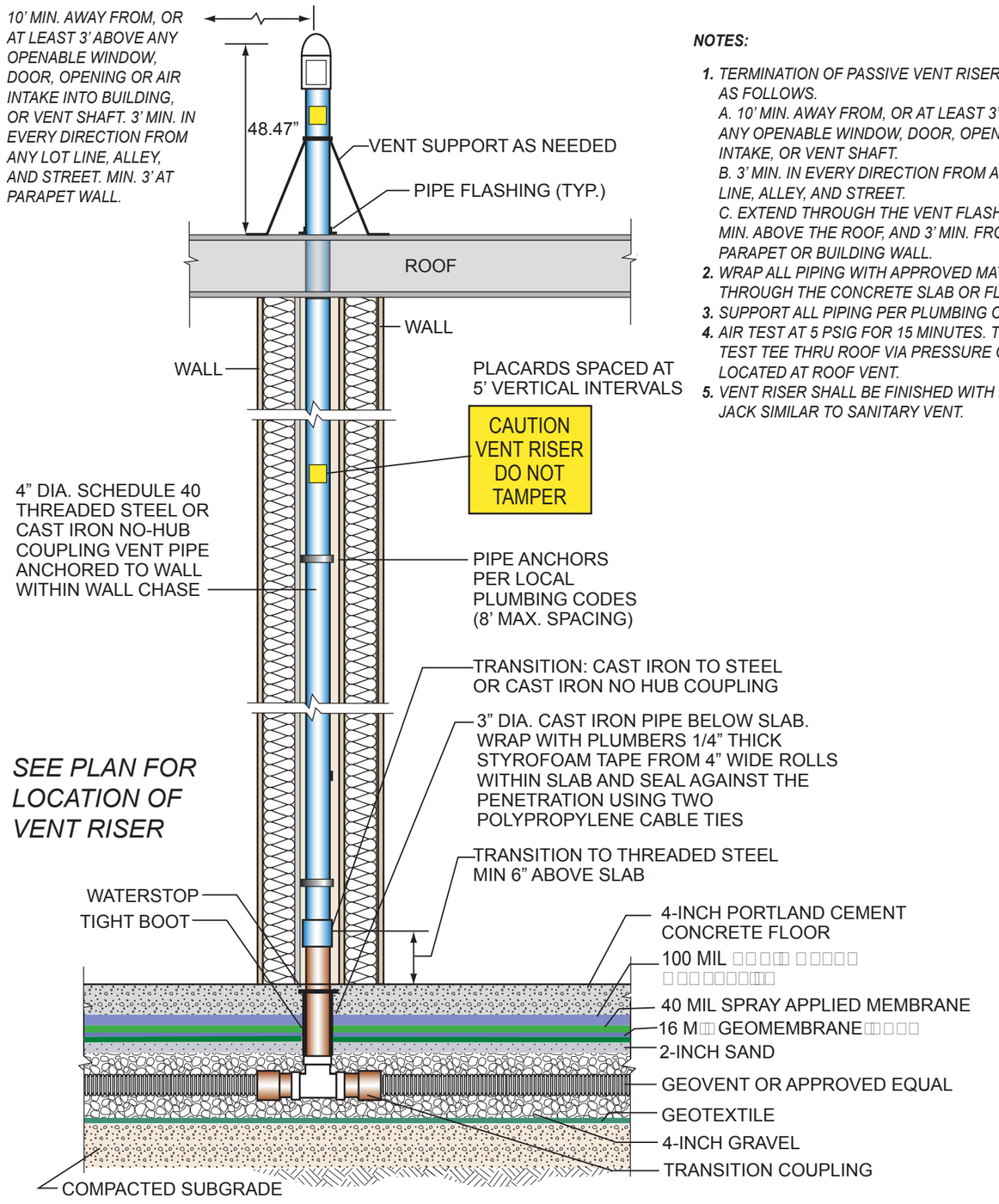
Figure 5-1

February 2017

PROPOSED REMEDIAL ACTION AREAS

1708 Wood Street, Oakland, California

WEST
Environmental Services & Technology

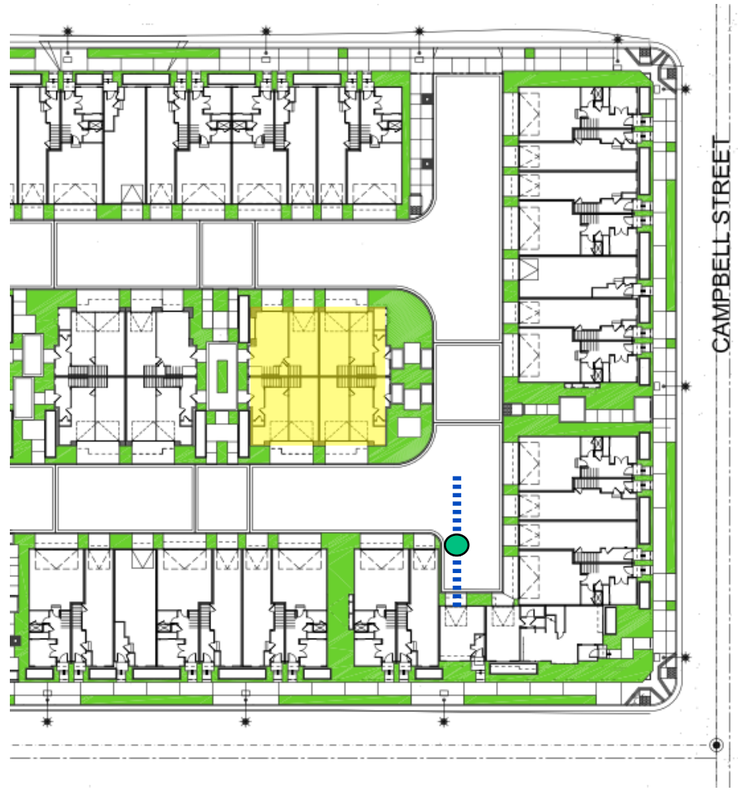


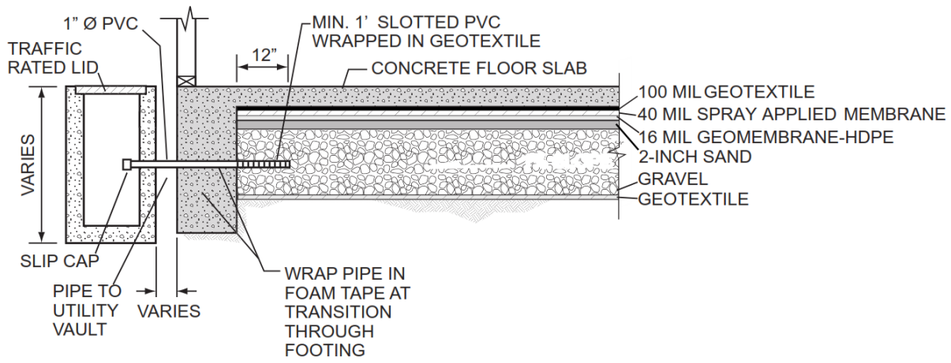
SUBSLAB VAPOR COLLECTION / VENT RISER DETAIL

N.T.S.

NOTES:

1. *TERMINATION OF PASSIVE VENT RISER SHALL BE AS FOLLOWS.*
   A. 10' MIN. AWAY FROM, OR AT LEAST 3' ABOVE ANY OPENABLE WINDOW, DOOR, OPENING OR AIR INTAKE, OR VENT SHAFT.
   B. 3' MIN. IN EVERY DIRECTION FROM ANY LOT LINE, ALLEY, AND STREET.
   C. EXTEND THROUGH THE VENT FLASHING. 12" MIN. ABOVE THE ROOF, AND 3' MIN. FROM ANY PARAPET OR BUILDING WALL.
2. *WRAP ALL PIPING WITH APPROVED MATERIAL THROUGH THE CONCRETE SLAB OR FLOOR.*
3. *SUPPORT ALL PIPING PER PLUMBING CODES.*
4. *AIR TEST AT 5 PSIG FOR 15 MINUTES. TEST FROM TEST TEE THRU ROOF VIA PRESSURE GAUGE LOCATED AT ROOF VENT.*
5. *VENT RISER SHALL BE FINISHED WITH ROOF JACK SIMILAR TO SANITARY VENT.*





SUBSLAB MONITORING PORT DETAIL

N.T.S.

VENT RISER LOCATION

GEO VENT BELOW SLAB LOCATION

CONCEPTUAL VAPOR SYSTEM DESIGN DETAILS

□□□□□□ □□d□□ree□
□a□a□d, California

WEST Environmental Services & Technology

Figure □-2

February 201□

APPENDIX A

DEVELOPMENT PLANS

LEGEND

LANDSCAPE AREAS,
EXCLUDING FILTRATION PLANTERS &
SQUARE PLANTER BENCHES

0 15 30 60 90

CLIENT:
PSAI PARTNERS, IV, LLC
18TH & WOOD STREET
SUITE 4
OAKLAND
CA
95032
408.364.2265

USA
811
BEFORE YOU DIG
CALL
800.227.2600

LICENSED LANDSCAPE ARCHITECT
ZEKI R. ABED
Lic. No. 3402
Expires
STATE OF CALIFORNIA

VAN DORN ABED
LANDSCAPE ARCHITECTS, INC.
81 14TH ST. SAN FRANCISCO, CA
ZIP 94103 PH (415) 864-1921 FAX(415) 864-6796

PROJECT MANAGER: MW
DRAWN BY: HN
CHECKED BY: ZA

PROJECT NAME/LOCATION:
ROADWAY EXPRESS
PARCEL A – ONSITE
OAKLAND CA.

DRAWING TITLE:
LANDSCAPE
CONSTRUCTION DRAWINGS

REVISIONS:

NO.	DESCRIPTION	BY:	DATE

SHEET TITLE:
OVERALL
SITE PLAN

SCALE:
1"=30'-0"

ISSUE DATE:
06/20/16

PROJECT NO.:
V1546

SHEET NO.:
L0.1
OF

APPENDIX B

SUMMARY OF HISTORICAL RECS

TABLE 3

HISTORICAL INVESTIGATION SUMMARY AND DATA GAP ANALYSIS

1708 Wood Street

Oakland, California

Recognized Environmental Conditions (RECs)		Historic Use of Area/Infrastructure	Chronology of Investigations	Analytical Summary/Rationale	Data Gap Analysis
REC 1A	Area 1-Northwestern UST Basin: The presence of closed in place historical USTs is interpreted to be a REC.	Area 1- Northwestern UST Basin is located in the northwestern corner of the Site. Two historical USTs (one with a capacity that apparently ranged between approximately 2,000 gallons and 8,000 gallons and another with a 10,000 gallon capacity) were identified in this area in May 1987. Due to structural concerns associated with the adjacent Storage Building, the two USTs were emptied of contents and abandoned in place. In October 2011, these two USTs and product and vent piping were removed in a shored excavation under the oversight of the ACDEH and the City of Oakland Fire Department. The cleanup for this Northwestern UST Area was conducted under existing ACDEH Case ID#: RO0000039.	1987- RS Eagan & Co. Tank Removal/Abandonment in Place	Soil samples from three borings were analyzed for total petroleum, BTEX and VOCs. The 1987 analytical suite of constituents was deemed insufficient for a UST with unknown contents. Sampling analytical rational is likely based on regulatory guidance at that time.	Soil gas/subslab samples have not been collected from Area 1. Due to the potential for waste solvents to be disposed of in the former USTs, a data gap was identified for potential VOCs in soil gas. In addition, due to the potential anaerobic biodegradation of residual TPH in soil and of organic sediments (i.e., Bay Mud), methane potentially may be present in soil gas. Therefore, additional investigations are needed to characterize the potential presence of VOCs and methane in soil gas.
			2007- Burns McDonnell conducted three borings (BM-7, BM-8, and BM-9) from 5 to 7 feet bgs in the Area 1- Northwest UST Basin.	Analytical suite included- soils and groundwater-TPHd, TPHg, TPHmo, VOCs, SVOCs, and CAM 17 Metals. Soil samples indicated detections TPHmo in borings BM-7 (at 6 feet bgs), BM-8 (at 7 feet bgs), and BM-9 (at 5 feet bgs) at concentrations of 86 mg/kg, 1,700 mg/kg, and 83 mg/kg, respectively. Acetone was detected at a concentration of 110 µg/kg in sample BM-8 (7 feet bgs). In addition, various Cam 17 Metals were detected in soil samples from borings BM-7, BM-8, and BM- 9. Grab groundwater samples indicated detections of TPHd in borings BM-7, BM-8, and BM-9 at concentrations of 120 µg/L, 61,000 µg/L, and 1,200 µg/L, respectively. TPHg was detected in borings BM-8 and BM-9 at concentrations of 54,000 µg/L and 180 µg/L, respectively. O & G were detected in boring BM-8 at a concentration of 430 mg/L. Methyl-t-butyl Ether (MTBE) was detected in BM-7, at a concentration of 2.3 µg/L. No discussion on sampling analytical rationale.	
			2008- Burns McDonnell conducted Additional Site Assessment, which included four (4) borings (BM-16 through BM-19). One boring is located outside the fence line along 18th Street (BM-19), one to the northeast outside the fence line of the abandoned tank (BM-18), one at the corner of the shop building (BM-16), and one down gradient and near the property edge (BM-17).	Analytical suite included- soil- soil samples in the area of the abandoned in place USTs (BM-16 through BM-19), showed TPHd concentrations ranging from below the detection limits to 7.6 mg/kg (BM-19 at 7.8 feet bgs). Concentrations of TPHmo ranged from below the detection limits to 19 mg/kg (BM-19 at 7.8 feet bgs). Sampling analytical rationale is based on UST contents.	
			2011- ACC Environmental Consultants Limited Soil and GW investigation. ACC conducted three soil borings in the Northwestern UST Basin (SB-1, SB-2, and SB-3) located in the northwestern corner of the subject property. The contents of the two USTs in the Northwestern Corner UST Basin were waste oil and unknown contents. As a result, the soil and groundwater samples (SB-1, SB-2, and SB-3) collected in the northwestern corner UST basin.	Analytical suite- soil and groundwater- TPHg, BTEX Lead Scavengers: Ethylene dibromide (EDB) and Ethylene dichloride (EDC) [EDC is also known as 1,2-dichloroethane or 1,2-DCA], MTBE, TAME, DIPE, ETBE, and TBA, TPHd, Total Oil and Grease, PCBs, PNAs, Creosote, and CAM 17 Metals. Sampling analytical rationale is based on UST contents.	
			2011-These two USTs and product and vent piping were removed by Burns McDonnell in a shored excavation under the oversight of the ACDEH and the City of Oakland Fire Department. Post removal of the UST the vicinity of the USTs was over excavated to 16 feet bgs. Confirmatory soil sidewall samples collected during the UST removal from terminal piping under 18th street side walk indicated residual TPHG and PhD at 104,000 µg/kg and 5930 µg/kg respectively. Offsite TPH impacted soil was excavated vertically until Bay Mud was encountered at approximately 4-5 feet bgs, and horizontally northward to the edge of 18th Street. Impacted soil was excavated laterally until no visual impacts were observed and PID headspace reading indicated no impacts to soil. The cleanup for this Northwestern UST Area was conducted under existing ACDEH Case ID#: RO0000039.	Analytical Suite- soil and groundwater- TPHg, TPHd, TPHmo, BTEX, MTBE, LUFT 5 Metals. Only TPHd was detected at SW3-W4B and SW4-W3.6 at 206 and 5,930 mg/kg respective in the side walk north of the USTs. Sampling analytical rationale is based on UST contents.	
			2015- Alameda County Department of Environmental Health granted case closure related to these USTs.	Not Applicable	
REC 1B	Area 2-Central UST Basin: The presence of leaking underground storage tanks (USTs), historical USTs, and the associated ongoing pollution characterization is interpreted to be a REC.	Area 2- is located in the central eastern portion of the Subject Property and historically contained three USTs, including one 10,000-gallon gasoline tank, one 10,000-gallon diesel tank, and one 6,000-gallon motor oil tank. The gasoline and motor oil USTs and associated piping were removed in 1987. In April of 1996, the remaining 10,000-gallon diesel UST and all associated piping were removed. In addition to these three USTs, an oil-water separator was also located in Area 2. Multiple soil and groundwater investigations were conducted between 1998 and 2011, which indicated the presence of petroleum constituents in soil and	1987-RS Eagan & Co. Tank Removal Report: Two USTs (a 10,000-gallon gasoline and 2,000-gallon motor oil) were removed. Two Monitoring wells were installed were the USTs were formerly located.	Analytical testing in April 1987 indicated that no contaminates were detected in the soil sample from beneath the former location of the gasoline UST (Total Hydrocarbons and BTEX). However, laboratory results indicated that 610 to 770 mg/kg of Oil and Grease (O&G) by solid waste method 5520 were detected in the soil sample collected from beneath the motor oil UST. 500 mg/ µg of volatile hydrocarbons and 21 mg/L of O&G were detected in water samples from the existing observation well (R.S. Eagan & Company 1987). Sampling analytical rational is likely based on regulatory guidance at that time.	Soil gas/subslab samples have not been collected near the former USTs. Due to the potential presence of petroleum-related VOCs (i.e., benzene) to be present from the UST releases, a data gap was identified for potential VOCs in soil gas. In addition, due to the potential anaerobic biodegradation of residual TPH in soil and of organic sediments (i.e., Bay Mud), methane potentially may be present in soil gas. Therefore, additional investigations are needed to characterize the potential presence of VOCs and methane in soil gas.
			1996- One Environment UST Removal and Site Closure Report. 10,000-gallon diesel UST and associated piping removed from the Site. During this tank removal, monitoring well MW-1, located within the excavation footprint, was also removed. In addition, approximately 113 tons of petroleum-impacted soil was removed and disposed from this excavation. Limited amounts of soil impacted with TPHd remained near the dispenser area.	Analytical Suite- soil and groundwater- TPH and BTEX. Two soil samples were collected under the UST for TPH and BTEX. No detectable concentrations of TPH above regulatory guidelines were identified. TPH level within the dispenser and stockpile samples were both above regulatory levels. Sampling analytical rationale was likely based on regulatory guidance.	
			1998- Bcon Environmental Preliminary Soil and GW Investigation. Investigation consisted of 8 boreholes to 8-14 feet bgs in the vicinity of the former USTs and Dispensers.	Analytical Suite- soil and groundwater- TPHd, TPHg, TPG O&G, BTEX, MTBE. Soil was found to be impacted with TPHd (5.4 mg/kg to 240 mg/kg) and Oil & Grease (23mg/kg to 43 mg/kg). Groundwater was encountered at depth ranging from 2 -7 feet bgs. Seven (7) of the eight (8) groundwater samples had detections of TPHd from 0.5 mg/L to 120 mg/L. Sampling analytical rationale was likely based on regulatory guidance related to the UST contents.	
			2000 to 2001- One Environment installed three monitoring wells (MW-3, MW-4, and MW- 5) around the location of the removed USTs in area 2 the central-eastern UST basin and prepared an Additional Soil and Groundwater Investigation report.	Analytical Suite- soil and groundwater- TPHd, TPHg, TPG O&G, BTEX, MTBE. Six soil samples were collected all samples were non detect for TPHd, TPHg, BTEX, MTBE and Oil & Grease. Three (3) groundwater samples were collected from the newly installed monitoring wells and all groundwater samples had detections of TPHd ranging from 65.7 µg/L to 78.7 µg/L. Sampling analytical rationale was likely based on regulatory guidance related to the UST contents.	

TABLE 3

HISTORICAL INVESTIGATION SUMMARY AND DATA GAP ANALYSIS

1708 Wood Street

Oakland, California

Recognized Environmental Conditions (RECs)		Historic Use of Area/Infrastructure	Chronology of Investigations	Analytical Summary/Rationale	Data Gap Analysis
		groundwater (predominately TPHd and total oil and grease). Groundwater monitoring was conducted at the Site from 2001 to 2008 via a network of shallow and deep wells.	2007- Burns & McDonnell began sampling the existing monitoring wells in December 2007. Burns & McDonnell initiated subsurface characterization at the Site, which consisted of six direct push borings, advanced to a maximum depth of 15 feet bgs. In the central-eastern portion of the Site where the USTs had been removed, petroleum-hydrocarbon impacts were seen in the shallow groundwater samples.	Analytical Suite- soil and groundwater- TPHd, TPHg, TPG O&G, VOC, SVOC and CAM 17 Metals. The highest impacts in this area were seen in grab groundwater samples from boring BM-2. This boring was located below the former fueling island and was advanced through the gravel fill placed in the excavation after the tank was removed. Moving down gradient, approximately 25 feet horizontally, concentrations of Total Petroleum Hydrocarbons in the diesel range (TPHd) fall to 140 micrograms per Liter (µg/L) in MW-2. Sampling analytical rational was likely based on regulatory guidance related to the UST contents.	
			2007 to 2009- Burns & McDonnell conducted 8 quarterly groundwater monitoring events at the Site since 2007. The monitoring indicated no TPH detections in the deep water zone MWs (MW-3, MW-4, MW-5) and very low detections in shallow groundwater zone MWs (MW-7 and MW-8). The final monitoring event in 2009 no target constituents were detected.	Analytical Suite- soil and groundwater- TPHd, TPHg, TPG O&G, VOC, SVOC and CAM 17 Metals. The groundwater monitoring wells screened between 10 and 30 feet bgs (MW-3, MW-4, and MW-5) have not shown any petroleum-hydrocarbon constituents. As a result of these findings Burns McDonnell requested regulatory closure "No Further Action" for the release related to the USTs located in the central eastern portion of the subject property. Sampling analytical rationale was likely based on regulatory guidance related to the UST contents.	
			2011- ACC Environmental Consultants Limited Soil and GW investigation. As a part of investigating, REC #1B (the presence of leaking underground storage tanks (USTs), historical USTs, and the associated ongoing pollution characterization at the subject property. ACC conducted five soil borings SB-10 (groundwater only), SB-11 (soil and groundwater), SB-12 (soil only), SB-13 (soil only), and SB-14 (soil only).	Analytical Suite- soil and groundwater- TPHd, TPHg, TPHmo, TPH O&G, BTEX, MTBE, Ethylene Glycol, HVOCs, and the 5 fuel oxygenates. The six existing monitoring wells were sampled and TPHmo at 130 µg/L in MW-6 and DIPE at 0.83 µg/L in MW-5 were detected. Sampling rational was based on the UST contents, the presence of the OWS and the maintenance shed's chemical storage.	
			2015- Alameda County Department of Environmental Health granted case closure related to these USTs.	Not Applicable	
REC 2	Oil water separator (OWS): The presence and use of an oil water separator at the subject property is interpreted to be a REC	One oil water separator was located in the vicinity of Area 2- the central UST basin. This oil water Separator was located in the area where tractor trailer washing and maintenance was conducted. This oil water separator and associated clean out line were removed in November 2011.	2011- ACC Environmental Consultants Limited Soil and GW investigation which included soil boring to investigate REC #2 (OWS), ACC conducted five soil borings SB-10 (groundwater only), SB-11 (soil and groundwater), SB-12 (soil only), SB-13 (soil only), and SB-14 (soil only).	Analytical Suite- soil and groundwater- TPHd, TPHg, TPHmo, TPH O&G, BTEX, MTBE, Ethylene Glycol, HVOCs, and the 5 fuel oxygenates. Soil boring SB-11 was conducted immediately adjacent to the northern side of the oil water separator. Field observations indicated gasoline odors and visible staining in this soil boring. Elevated PID reading ranged from 280-300 ppm. Groundwater was encountered in this boring at 2.5 feet bgs. Soil in this boring was impacted with lead, and petroleum hydrocarbons. Groundwater in the grab groundwater samples was impacted by TPHd, TPHmo, Total Oil and Grease, MTBE, and metals. Sampling rationale was based on the UST contents, the presence of the OWS and the maintenance shed's chemical storage as infrastructure for all three RECs are in close proximity.	Soil gas/subslab samples have not been collected near the OWS. Due to the potential for waste solvents to be disposed of in the former OWS, a data gap was identified for potential VOCs in soil gas. In addition, due to the potential anaerobic biodegradation of residual TPH in soil and of organic sediments (i.e., Bay Mud), methane potentially may be present in soil gas. Therefore, additional investigations are needed to characterize the potential presence of VOCs and methane in soil gas.
			2011- Burns McDonnell removed the oil water separator, which was the primary source of subsurface contamination in Area 2. Free phase oil, oily water and oil impacted soils were encountered surround the OWS. The TPH impacted materials were over excavated and confirmation soil samples were collected from each sidewall of the excavation. Lateral excavation continued until confirmatory soil samples verified TPH impacted soil was removed. Some cadmium and zinc are present in this area exceeding the commercial ESLs. The excavation continued vertically until bay mud was encountered at 4.6 feet bgs. The top 6-inches of bay MUD was excavated as oil-impacted groundwater infiltrated the excavation. This groundwater was also removed. Oily water and soil were also excavated along the 40 foot cleanout line associated with OWS. 110 cubic yards of soil was excavated from the OWS and clean out line.	Analytical Suite- soil and groundwater- TPHd, TPHg, TPHmo, TPH O&G, BTEX, MTBE, LUFT 5 metals, lead scavengers, PNAs, PCBs, creosote and CCR title 22 metals. Sampling analytical was likely based on potential contents of the OWS.	
			2015- Alameda County Department of Environmental Health granted case closure related to the OWS.	Not Applicable	
REC 3	Maintenance Shop: The fact that numerous drums of petroleum products are being stored at the subject property and vehicle maintenance is being conducted is interpreted to be a REC.	A maintenance shop/shed was located in area 2-the central UST basin. This maintenance shop was primarily used to store 55-gallon drums of oils and automotive related chemicals.	2011- ACC Environmental Consultants Limited Soil and GW investigation. As a part of investigating REC #3 (maintenance shop, chemical storage, and vehicle maintenance), ACC conducted one soil borings SB-10 (groundwater only). The maintenance shop was removed in 2011 and soil and groundwater were in the immediate vicinity of the maintenance shop were removed as a part of the OWS removal discussed in REC 2.	Analytical Suite- soil and groundwater- TPHd, TPHg, TPHmo, TPH O&G, BTEX, MTBE, Ethylene Glycol, HVOCs, and the 5 fuel oxygenates. Analytical suite was chosen based on the chemicals observed to be used and stored at the Site. A representative groundwater sample was collected to characterize groundwater in the immediate vicinity of the maintenance shop to address any potential releases. No soil samples were collected, as pea gravel was encountered in the soil boring. Soil boring SB-10 was conducted immediately adjacent to the southern side of the maintenance shop. Groundwater was encountered in this boring at 2.5 feet bgs. Groundwater in the grab groundwater samples from SB-10 and SB-11 were impacted by petroleum hydrocarbons.	Soil gas samples have not been collected near the former Maintenance Shop. Due to the historical storage of automotive-related chemicals, a data gap was identified for potential VOCs in soil gas. In addition, due to the potential anaerobic biodegradation of organic sediments (i.e., Bay Mud), methane potentially may be present in soil gas. Therefore, additional investigations are needed to characterize the potential presence of VOCs in soil gas.

TABLE 3

HISTORICAL INVESTIGATION SUMMARY AND DATA GAP ANALYSIS

1708 Wood Street

Oakland, California

Recognized Environmental Conditions (RECs)		Historic Use of Area/Infrastructure	Chronology of Investigations	Analytical Summary/Rationale	Data Gap Analysis
REC 4	Subject Property Historical Industrial Use: The subject property has been identified as historically utilized for industrial (Roofing, Furniture Warehousing, Sheet Metal, and Iron Works) purposes and automotive (McKinley Perkins, Historical USTs and California Motor Express) related purposes. These historical uses of the subject property are interpreted to be a REC.	The Subject Property has been historically used for industrial uses of the Subject Property (i.e., roofing, furniture warehousing, and sheet metal and iron works) and automotive uses (McKinley Perkins and California Motor Express)	2011- ACC Environmental Consultants Limited Soil and GW investigation. REC #4 (historical uses of the subject property for industrial purposes; Roofing, Furniture Warehousing, Sheet Metal, Iron Works, McKinley Perkins, historical USTs and California Motor Express), ACC conducted ten soil borings to address this REC. SB-4 (soil and groundwater), SB-5 (soil only), SB-6 (soil and groundwater), SB-7 (soil and groundwater), and SB-8 (soil only) around the loading dock building located in the southwestern portion of the subject property. SB-10 (groundwater only), SB-11 (soil and groundwater), SB-12 (soil only), SB-13 (soil only), and SB-14 (soil only) in the vicinity of the central UST basin. SB-15 (soil only), SB-16 (soil and groundwater), SB-17 (groundwater only), SB-18 (groundwater only), and SB-19 (soil only) on the eastern side of the Subject Property where former structures were located.	Analytical Suite- soil and groundwater- PNAs, VOCs, Cam 17 Metals, TPHd, TPHmo, and TPHg. Soils in the eastern portion of the subject property were impacted above screening levels by lead. Groundwater in the grab groundwater sample was impacted by metals, and petroleum hydrocarbons. Sampling analytical was selected based on historical uses of subject property.	Soil gas samples have not been collected near the historical industrial use area. Due to the potential for use, storage and disposal of industrial related chemicals (i.e., solvents), a data gap was identified for potential VOCs in soil gas. In addition, due to the potential anaerobic biodegradation of organic sediments (i.e., Bay Mud), methane potentially may be present in soil gas. Therefore, additional investigations are needed to characterize the potential presence of VOCs and methane in soil gas.
REC 5	Site Vicinity Industrial Use: The subject property is located in a portion of the City of Oakland that has been utilized for heavy industrial purposes for more that fifty years. As a result of this heavy industrial use in the immediate vicinity of the subject property, numerous releases of hazardous materials and other environmental issues are prevalent. ACC could not eliminate the possibility that contaminated groundwater from nearby sites of environmental concern could be impacting the subject property. The likely potential that impacted groundwater could be migrating to and impacting the subject property is interpreted to be a REC. In addition, the likely potential that impacted groundwater could be migrating to and impacting the subject property is interpreted to be a potential vapor intrusion concern (PVIC).	Historical used of adjacent properties included: Southern Pacific Railroad Station. California Door Company, National Pharmacy, Milling Co., Galvanizing Works and Machine Shops.	2011- ACC Environmental Consultants Limited GW investigation. As a part of investigating REC #5 (potential for impacted groundwater to migrating to and impacting the subject property), ACC conducted soil borings SB-17 (groundwater only), SB-18 (groundwater only)	Analytical Suite-groundwater- PNAs, VOCs, Cam 17 Metals, TPHd, TPHmo, and TPHg. Grab groundwater samples were reported impacted by metals, petroleum hydrocarbons, MTBE, naphthalene, tetrachloroethene, and B(a)P. Sampling analytical was selected based on historical uses of offsite properties.	Soil gas samples have not been collected to characterize potential on-Site migration of VOCs in soil gas from the off-Site historical industrial use area. Due to the potential for use, storage and disposal of industrial related chemicals (i.e., solvents), a data gap was identified for potential VOCs in soil gas. Therefore, additional investigations are needed to characterize the potential presence of VOCs in soil gas.

TABLE 3

HISTORICAL INVESTIGATION SUMMARY AND DATA GAP ANALYSIS

1708 Wood Street

Oakland, California

Recognized Environmental Conditions (RECs)		Historic Use of Area/Infrastructure	Chronology of Investigations	Analytical Summary/Rationale	Data Gap Analysis
REC 6	Onsite HMIRS and CHMIRS Releases: Due to the number of releases reported, the limited information on what environmental media may have been affected, the lack of detailed cleanup procedures and the types of chemicals spilled in these releases the subject properties listing on the Hazardous Material Incident Reporting System (HMIRS) & the California Hazardous Material Incident Reporting System (CHMIRS) databases is interpreted to be a REC.	Loading dock building utilized for shipping and receiving	2011- ACC conducted soil borings SB-4 (soil and groundwater), SB-5 (soil only), SB-6 (soil and groundwater), SB-7 (soil and groundwater), and SB-8 (soil only) around the loading dock building located in the southwestern portion of the subject property.	Residual soil impacts above screening levels in the vicinity of the loading dock include TPHd (220 to 2,700 mg/kg), and benzo[a]pyrene (0.16 to 0.35 mg/kg). Residual groundwater impacts near the loading dock building include TPHd (650 to 940 µg/L) and TPHmo (4,550 to 2,400 µg/L). Sampling analytical was selected based on unknown nature of the releases.	Soil gas samples have not been collected to characterize potential presence of VOCs in soil gas from historical on-Site releases. Due to the releases of potential industrial related chemicals (i.e., solvents), a data gap was identified for potential VOCs in soil gas. In addition, due to the potential anaerobic biodegradation of organic sediments (i.e., Bay Mud), methane potentially may be present in soil gas. Therefore, additional investigations are needed to characterize the potential presence of VOCs and methane in soil gas.

NOTES

MW-Monitoring Well

GW- Groundwater

µg- micrograms

mg- milligrams

L- Liter

bgs- below ground surface

TPH-d- Total petroleum hydrocarbons as diesel

TPH-g- Total petroleum hydrocarbons as gasoline

TPH-mo- Total petroleum hydrocarbons as motor oil

RWQCB- Regional Water Quality Control Board

REC- Recognized Environmental Condition

ESL- Environmental Screening Level

OWS- Oil Water Separator

Table 4
2011 Investigaiton Soil Boring Summary
1708 Wood Street
Oakland, California

Boring ID Number	Boring Location	Total Detph of Boring (Feet [ft] below Ground Surface [bgs])	Depth to Water ft bgs	Soil Sample Depths ft bgs	Media Sampled	Notes and Observations
SB-1	Western side of Area 1-Northwestern UST Basin	12	1.67	2.5-3.0	Soil and GW	One soil sample (SB-1) was collected from this soil boring at 2.5-3.0 feet bgs in an area of visible soil discoloration and diesel odor. Soil in this boring consisted of dark brown to grayish brown plastic clay that was moist to wet with very fine to finegrained sand and trace gravel. No elevated PID readings
SB-2	Eastern side of Area 1-Northwestern UST Basin	12	2.5	2.5-3.0	Soil and GW	One soil sample (SB-2) was collected from this soil boring at approximately 2.5-3.0 feet bgs, in an area of visible soil discoloration (grayish black), diesel odor and sheen. Soil in this boring consisted of dark brown to grayish brown plastic clay that was moist to wet withvery fine to fine-grained sand and trace gravels. No elevated PID readings were observed.
SB-3	Northern side of Area 1-Northwestern UST Basin	12	1.8	2.5-3.0	Soil and GW	One soil sample (SB-3) was collected from this soil boring at a depth of 2.0-2.5 feet bgs. Soil in this boring consisted of dark brown to grayish brown plastic clay that was moist to wet with very fine to fine-grained sand and trace gravel. Soil in this boring appeared to be discolored (grayish black) and
SB-4	Northern-western side of the Loading Dock Building	12	2.5	2.5-3.0	Soil and GW	One soil sample (SB-4) was collected at approximately 2.0-2.5 feet bgs. Soil in this boring consisted of dark grayish-brown plastic clay that was moist to wet with very fine to fine-grained sand and trace gravel. No odor or elevated PID
SB-5	Northern-central side of the Loading Dock Building	12	7.5	2.5-3.0	Soil Only	One soil sample (SB-5) was collected from this soil boring at approximately 2.0-2.5 feet bgs. Soil in this boring consisted of dark grayish brown plastic clay that was moist to wet with very fine to fine-grained sand and trace gravel. A one-foot thick fine-grained sand lens with shell fragments and a sulfur odor was encountered at approximately 7.5-8.0 feet bgs. Soil in this boring had a diesel odor. No elevated PID readings were observed.
SB-6	Northern-eastern side of the Loading Dock Building	12	2.5	2.0-2.5	Soil and GW	One soil sample (SB-6) was collected at approximately 2.0-2.5 feet bgs. Soil in this boring consisted of dark grayish-brown plastic clay that was moist to wet with very fine to fine-grained sand and trace gravel. Soil in this boring had a diesel odor. No elevated PID readings were observed.
SB-7	Southern-western side of the Loading Dock Building	12	2.43	2.5-3.0	Soil and GW	One soil sample (SB-7) was collected from at approximately 2.5-3.0 feet bgs. Soil encountered consisted of very dark greenish-grey to dark brown plastic clay that was moist to wet with very fine to fine-grained sand and trace gravel. No elevated PID readings were observed.
SB-8	Southern-central side of the Loading Dock Building	6	2.25	1.5-2.0	Soil Only	One soil sample (SB-8) was collected from this soil boring at approximately 1.5-2.0 feet bgs. Soil in this boring consisted of very dark greenish-grey to dark brown plastic clay that was moist to wet with very fine to fine-grained sand and trace gravels. No elevated PID readings were observed.
SB-9	Area 2-Central Eastern UST Basin. East of MW-4	12	1.2	1.0-1.5 & 7.5-8.0	Soil Only	Two soil samples (SB-9 [1.0-1.5] and SB-9 [7.5-8.0]) were collected from this soil boring. Soil in this boring consisted of very dark grey to dark greenish grey plastic clay that was moist to wet with very fine to fine-grained sand. No elevated PID readings were observed.
SB-10	Area 2-Central Eastern UST Basin. Between MW-7 and MW-8	12	2.5	NA	GW Only	No soil sample was collected from this soil boring location as this boring was conducted through pea gravel fill associated with the former UST basin. Groundwater was encountered at approximately 2.5 feet bgs and equilibrated in the temporary monitoring well to 2.5 feet bgs. One groundwater sample (SB-10) was collected from this boring.
SB-11	Area 2-Central Eastern UST Basin. Adjacent to oil water separator, east of MW-4.	12	2.75	2.0-2.5	Soil and GW	One soil sample (SB-11) was collected at approximately 2.0-2.5 feet bgs from an area of visible staining, elevated PID readings and odor. Soil in this boring consisted of dark grayish-brown plastic clay that was moist to wet with very fine to fine-grained silty sand. Elevated PID readings were observed ranging from 280-300 parts per million (ppm). The soil and groundwater in this soil boring exhibited a sheen.
SB-12	Area 2-Central Eastern UST Basin, east of MW-5	3	NA	3.0-3.5	Soil Only	Two attempts were made to complete this boring. Refusal was encountered in both attempts at approximately 3.0 feet bgs. One soil sample (SB-12) was collected from the second attempt at approximately 2.0-2.5 feet bgs. Soil consisted of dark grayish-brown to black plastic clay that was moist to wet with very fine to fine-grained sand and trace gravel. Soils in this boring had a gasoline odor; however no elevated PID readings were observed. No groundwater was encountered in this boring.
SB-13	Area 2-Central Eastern UST Basin, between MW-3 and MW-6	12	3.25	1.5-2.0	Soil Only	Soil in this boring consisted of very dark grayish brown plastic clay that was moist to wet with very fine-to-fine grained sand and trace gravel and had a diesel odor. Soils below 3 feet bgs were observed to be saturated and no recovery was obtained. Additionally, no elevated PID readings were observed. No temporary well was placed in this well and no groundwater sample was collected since it was located in between existing monitoring wells.
SB-14	Area 2-Central Eastern UST Basin, north of MW-7	16	3.25	14.5-15	Soil Only	Soil in this boring consisted of very dark greenish-grey to black plastic clay that was moist to wet with very fine to fine-grained sand and trace gravel. A two-foot thick fine-grain sand lens was encountered at approximately 12-14 feet bgs in this boring. Soil appeared to be discolored (grayish black) and had a diesel odor. No elevated PID readings were observed. Groundwater was encountered at approximately 3.25 feet bgs however, no temporary well was placed in this boring and no groundwater sample was collected.
SB-15	Eastern side of the subject property in an area historically utilized by Sheet Metal, Iron Works, and McKinley Perkins Petroleum	12	2.25	2.0-2.5	Soil Only	Soil consisted of dark yellowish-brown to black plastic clay that was moist to wet with very fine to fine-grained sand and trace gravel. Soil in this boring appeared to be discolored and had a diesel odor. No elevated PID readings were observed. No temporary well was placed in this boring and no groundwater sample was collected.
SB-16	Eastern side of the subject property in an area historically utilized by Sheet Metal, Iron Works, and McKinley Perkins Petroleum	12	2.65	2.0-2.5	Soil and GW	Soil consisted of dark greenish-grey to black plastic clay that was moist to wet with very fine to fine-grained sand and trace gravel. Soil appeared to be discolored (grayish black) and had a diesel odor. No elevated PID readings were observed.

Table 4
2011 Investigaiton Soil Boring Summary
1708 Wood Street
Oakland, California

Boring ID Number	Boring Location	Total Detph of Boring (Feet [ft] below Ground Surface [bgs])	Depth to Water ft bgs	Soil Sample Depths ft bgs	Media Sampled	Notes and Observations
SB-17	Northeastern Corner of Site	12	2.55	NA	GW Only	No soil samples were collected and the soils were not logged. Groundwater was encountered at approximately 2.55 feet bgs and one groundwater sample (SB-17) was collected.
SB-18	Southeastern Corner of Site	12	2.33	NA	GW Only	No soil samples were collected and the soils were not logged. Groundwater was encountered at approximately 2.33 feet bgs and one groundwater sample (SB-18) was collected.
SB-19	Southeastern side of Site	2	NA	1.0-1.5	Soil Only	Soil in this boring consisted of brown plastic clay that was moist to wet with very fine-to-fine grained sand and trace gravel. No elevated PID readings or odors were observed. Groundwater was not encountered in this soil boring.
SB-20	Area 2-Central Eastern UST Basin. Northeast of	12	1.2 ft bgs	1.0-1.5 & 11.5-	Soil Only	Soil in this boring consisted of very dark grey to dark greenish grey plastic clay that was moist to wet with very fine to fine-grained sand. No elevated PID readings were observed.
SB-21	Area 2-Central Eastern UST Basin. Southeast of MW-8	12	1.3 ft bgs	1.0-1.5 & 3.5-4.0	Soil Only	Soil in this boring consisted of very dark brown plastic clay that was moist to wet with very fine to fine-grained sand. No elevated PID readings were observed.
SB-22	Area 2-Central Eastern UST Basin. Southeast of MW-5	12	1.3 ft bgs	1.0-1.5 & 7.5-8.0	Soil Only	Soil in this boring consisted of very dark grey plastic clay that was moist to wet with very fine to fine-grained sand. No elevated PID readings were observed.
SB-23	Area 2-Central Eastern UST Basin. Southeast of MW-6	12	1.25 ft bgs	1.0-1.5 & 7.5-8.0	Soil Only	Soil in this boring consisted of very dark grey plastic clay that was moist to wet with very fine to fine-grained sand. No elevated PID readings were observed.
SB-24	Eastern side of the subject property in an area historically utilized by Sheet Metal, Iron Works, and McKinley Perkins Petroleum	12	1.35 ft bgs	1.0-1.5 & 11.5-12.0	Soil Only	Soil in this boring consisted of dark greenish-grey to greenish black plastic clay that was moist to wet with very fine to finegrained sand. No elevated PID readings were observed.
SB-25	Eastern side of the subject property in an area historically utilized by Sheet Metal, Iron Works, and McKinley Perkins Petroleum	12	1.2 ft bgs	1.0-1.5 & 11.5-12.0	Soil Only	Soil in this boring consisted of very dark grey to black plastic clay that was moist to wet with very fine to fine-grained sand. No elevated PID readings were observed.
SB-26	Eastern side of the subject property in an area historically utilized by Sheet Metal, Iron Works, and McKinley Perkins Petroleum	11.5	1.25 ft bgs	1.0-1.5 & 11.5-12.0	Soil Only	Soil in this boring consisted of dark greenish-grey to black plastic clay that was moist to wet with very fine to fine-grained sand. No elevated PID readings were observed.
SB-27	Eastern side of the subject property in an area historically utilized by Sheet Metal, Iron Works, and McKinley Perkins Petroleum	12	1.25		Soil Only	Soil in this boring consisted of dark greenish-grey to black plastic clay that was moist to wet with very fine to fine-grained sand. No elevated PID readings were observed.

Table 5
Well Construction Details
1708 Wood Street
Oakland, California

Well ID	Instatllation Date	Casing Diameter (inches)	Casing Elevation ft. MSL	Construction Depth ft. bgs	Screened Interval ft. bgs	Comments
MW-1	March 1987	4	Unknown	10	0.5-10	Well Destroyed August 2008
MW-2	March 1987	4	9.89	9.5	0.5-9.5	Well Destroyed August 2008
MW-3	September 2000	2	10.11	30	10-30	Well Destroyed May 19, 2015
MW-4	September 2000	2	9.52	30	10-30	Well Destroyed May 19, 2015
MW-5	September 2000	2	9.97	30	10-30	Well Destroyed May 19, 2015
MW-6	February 2009	1	10.13	10	5-10	Well Destroyed May 19, 2015
MW-7	February 2009	1	9.93	10	5-10	Well Destroyed May 19, 2015
MW-8	February 2009	1	9.83	10	5-10	Well Destroyed May 19, 2015

ft. MSL- Elevation in feet above mean sea level

ft. bgs- Depth in feet below ground surface

Notes:

Construction depth and screened intervals for MW-3, MW-4, and MW-5 based on boring logs located in the *Additional Groundwater Investigation Reporl by One Environment, 2001*

Casing elevation for MW-2, MW-3, MW-4, and MW-5 resurveyed by Luk and Associates on December 20, 2007

Casing elevation for MW-6, MW-7, and MW-8 surveyed by Luk and Associates on March 3, 2009

In August 2008, Burns & McDonnell destroyed monitoring wells MW-1 and MW-2; these wells were constructed without a proper sanitary seal and posed a risk as a pathway to the subsurface for contaminants..

In May 2015, Burns & McDonnell destroyed Monitoring Wells MW-3, MW-4, MW-5, MW-6, MW-7 & MW-8 as a part of site closure

APPENDIX C

SOIL GAS FIELD DATA FORMS AND

LABORATORY DATA CERTIFICATES

K PRIME, Inc.

CONSULTING ANALYTICAL CHEMISTS

3621 Westwind Blvd.
Santa Rosa CA 95403
Phone: 707 527 7574
FAX: 707 527 7879

TRANSMITTAL

DATE: 12/22/2016

TO: MR.PETER MORRIS
WEST ENVIRONMENTAL S&T
711 GRAND AVENUE, SUITE 220
SAN RAFAEL, CA 94901

Phone: 415-460-6770
Fax: 415-460-6771
Email: main@westenvironmental.com
peterm@westenvironmental.com

ACCT: 9946
PROJ: PSAI.OAKLAND

FROM: Richard A. Kagel, Ph.D. RAK 12/22/2016
Laboratory Director

SUBJECT: LABORATORY RESULTS FOR YOUR PROJECT PSAI.OAKLAND

Enclosed please find K Prime's laboratory reports for the following samples:

SAMPLE ID	TYPE	DATE	TIME	KPI LAB #
SG-1	AIR	12/14/16	14:50	150206
SG-2	AIR	12/14/16	15:19	150207
SG-3	AIR	12/14/16	14:17	150208
SG-4	AIR	12/14/16	13:00	150209

The above listed sample group was received on 12/15/16 and tested as requested on the chain of custody document.

Please call me if you have any questions or need further information.
Thank you for this opportunity to be of service.

K PRIME, INC.
LABORATORY REPORT

K PRIME PROJECT: 9946
CLIENT PROJECT: PSAI.OAKLAND

METHOD: VOC'S IN AIR
REFERENCE: EPA METHOD TO 15 (GC-MS-SCAN)

SAMPLE ID:	SG-1
LAB NO:	150206
SAMPLE TYPE:	AIR
DATE SAMPLED:	12/14/2016
TIME SAMPLED:	14:50
BATCH ID:	120816A1
DATE ANALYZED:	12/15/2016

COMPOUND NAME	CAS NO.	PPB (V/V) RL	PPB (V/V) SAMPLE CONC	µg/cu. m RL	µg/cu. m SAMPLE CONC
DICHLORODIFLUOROMETHANE	75-71-8	10.0	ND	49.5	ND
CHLOROMETHANE	74-87-3	10.0	ND	20.7	ND
DICHLOROTETRAFLUOROETHANE	76-14-2	10.0	ND	69.9	ND
VINYL CHLORIDE	75-01-4	10.0	ND	25.6	ND
BROMOMETHANE	74-83-9	10.0	ND	38.8	ND
CHLOROETHANE	75-00-3	10.0	ND	26.4	ND
TRICHLOROFLUOROMETHANE	75-69-4	10.0	ND	56.2	ND
1,1-DICHLOROETHENE	75-35-4	10.0	ND	39.7	ND
TRICHLOROTRIFLUOROETHANE	76-13-1	10.0	ND	76.6	ND
METHYLENE CHLORIDE	75-09-2	10.0	ND	34.7	ND
1,1-DICHLOROETHANE	75-34-3	10.0	ND	40.5	ND
CIS-1,2-DICHLOROETHENE	159-59-2	10.0	ND	39.7	ND
CHLOROFORM	67-66-3	10.0	ND	48.8	ND
1,1,1-TRICHLOROETHANE	71-55-6	10.0	ND	54.6	ND
1,2-DICHLOROETHANE	107-06-2	10.0	ND	40.5	ND
BENZENE	71-43-2	10.0	ND	31.9	ND
CARBON TETRACHLORIDE	56-23-5	10.0	ND	62.9	ND
1,2-DICHLOROPROPANE	78-87-5	10.0	ND	46.2	ND
TRICHLOROETHENE	79-01-6	10.0	ND	53.7	ND
CIS-1,3-DICHLOROPROPENE	10061-01-5	10.0	ND	45.4	ND
TRANS-1,3-DICHLOROPROPENE	10061-02-6	10.0	ND	45.4	ND
TOLUENE	108-88-3	10.0	ND	37.7	ND
1,1,2-TRICHLOROETHANE	79-00-5	10.0	ND	54.6	ND
1,2-DIBROMOETHANE	106-93-4	10.0	ND	76.8	ND
TETRACHLOROETHENE	127-18-4	10.0	ND	67.8	ND
CHLOROBENZENE	108-90-7	10.0	ND	46.0	ND
ETHYLBENZENE	100-41-4	10.0	ND	43.4	ND
XYLENE (M+P)	179601-23-1	20.0	ND	86.8	ND
STYRENE	100-42-5	10.0	ND	42.6	ND
XYLENE (O)	95-47-6	10.0	ND	43.4	ND
1,1,2,2-TETRACHLOROETHANE	79-34-5	10.0	ND	68.7	ND
1,3,5-TRIMETHYLBENZENE	108-67-8	10.0	ND	49.2	ND
1,2,4-TRIMETHYLBENZENE	95-63-6	10.0	ND	49.2	ND
1,3-DICHLOROBENZENE	541-73-1	10.0	ND	60.1	ND
1,4-DICHLOROBENZENE	106-46-7	10.0	ND	60.1	ND
1,2-DICHLOROBENZENE	95-50-1	10.0	ND	60.1	ND
1,2,4-TRICHLOROBENZENE	120-82-1	10.0	ND	74.2	ND
HEXACHLOROBUTADIENE	87-68-3	10.0	ND	107	ND

NOTES:
ND - NOT DETECTED AT OR ABOVE THE STATED REPORTING LIMIT
RL - REPORTING LIMIT
NA - NOT APPLICABLE OR AVAILABLE
µg/cu. m VALUES ARE CALCULATED FROM PPB RESULTS USING NORMAL TEMPERATURE AND PRESSURE (NPT).

APPROVED BY: MM
DATE: 12/22/16

K PRIME, INC.
LABORATORY REPORT

K PRIME PROJECT: 9946
CLIENT PROJECT: PSAI.OAKLAND

METHOD: VOC'S IN AIR
REFERENCE: EPA METHOD TO 15 (GC-MS-SCAN)

SAMPLE ID:	SG-2
LAB NO:	150207
SAMPLE TYPE:	AIR
DATE SAMPLED:	12/14/2016
TIME SAMPLED:	15:19
BATCH ID:	120816A1
DATE ANALYZED:	12/15/2016

COMPOUND NAME	CAS NO.	PPB (V/V) RL	PPB (V/V) SAMPLE CONC	µg/cu. m RL	µg/cu. m SAMPLE CONC
DICHLORODIFLUOROMETHANE	75-71-8	2.00	ND	9.89	ND
CHLOROMETHANE	74-87-3	2.00	ND	4.13	ND
DICHLOROTETRAFLUOROETHANE	76-14-2	2.00	ND	14.0	ND
VINYL CHLORIDE	75-01-4	2.00	ND	5.11	ND
BROMOMETHANE	74-83-9	2.00	ND	7.77	ND
CHLOROETHANE	75-00-3	2.00	26.1	5.28	68.8
TRICHLOROFLUOROMETHANE	75-69-4	2.00	2.65	11.2	14.9
1,1-DICHLOROETHENE	75-35-4	2.00	ND	7.93	ND
TRICHLOROTRIFLUOROETHANE	76-13-1	2.00	ND	15.3	ND
METHYLENE CHLORIDE	75-09-2	2.00	ND	6.95	ND
1,1-DICHLOROETHANE	75-34-3	2.00	ND	8.10	ND
CIS-1,2-DICHLOROETHENE	159-59-2	2.00	ND	7.93	ND
CHLOROFORM	67-66-3	2.00	2.08	9.77	10.2
1,1,1-TRICHLOROETHANE	71-55-6	2.00	ND	10.9	ND
1,2-DICHLOROETHANE	107-06-2	2.00	ND	8.09	ND
BENZENE	71-43-2	2.00	4.45	6.39	14.2
CARBON TETRACHLORIDE	56-23-5	2.00	ND	12.6	ND
1,2-DICHLOROPROPANE	78-87-5	2.00	ND	9.24	ND
TRICHLOROETHENE	79-01-6	2.00	ND	10.7	ND
CIS-1,3-DICHLOROPROPENE	10061-01-5	2.00	ND	9.08	ND
TRANS-1,3-DICHLOROPROPENE	10061-02-6	2.00	ND	9.08	ND
TOLUENE	108-88-3	2.00	3.69	7.54	13.9
1,1,2-TRICHLOROETHANE	79-00-5	2.00	ND	10.9	ND
1,2-DIBROMOETHANE	106-93-4	2.00	ND	15.4	ND
TETRACHLOROETHENE	127-18-4	2.00	ND	13.6	ND
CHLOROBENZENE	108-90-7	2.00	ND	9.21	ND
ETHYLBENZENE	100-41-4	2.00	ND	8.68	ND
XYLENE (M+P)	179601-23-1	4.00	ND	17.4	ND
STYRENE	100-42-5	2.00	ND	8.52	ND
XYLENE (O)	95-47-6	2.00	2.13	8.68	9.25
1,1,2,2-TETRACHLOROETHANE	79-34-5	2.00	ND	13.7	ND
1,3,5-TRIMETHYLBENZENE	108-67-8	2.00	ND	9.83	ND
1,2,4-TRIMETHYLBENZENE	95-63-6	2.00	4.57	9.83	22.5
1,3-DICHLOROBENZENE	541-73-1	2.00	ND	12.0	ND
1,4-DICHLOROBENZENE	106-46-7	2.00	ND	12.0	ND
1,2-DICHLOROBENZENE	95-50-1	2.00	ND	12.0	ND
1,2,4-TRICHLOROBENZENE	120-82-1	2.00	ND	14.8	ND
HEXACHLOROBUTADIENE	87-68-3	2.00	ND	21.3	ND

NOTES:
ND - NOT DETECTED AT OR ABOVE THE STATED REPORTING LIMIT
RL - REPORTING LIMIT
NA - NOT APPLICABLE OR AVAILABLE
µg/cu. m VALUES ARE CALCULATED FROM PPB RESULTS USING NORMAL TEMPERATURE AND PRESSURE (NPT).

APPROVED BY: _____
DATE: 12/22/16

K PRIME, INC.
LABORATORY REPORT

K PRIME PROJECT: 9946
CLIENT PROJECT: PSAI.OAKLAND

METHOD: VOC'S IN AIR
REFERENCE: EPA METHOD TO 15 (GC-MS-SCAN)

SAMPLE ID:	SG-3
LAB NO:	150208
SAMPLE TYPE:	AIR
DATE SAMPLED:	12/14/2016
TIME SAMPLED:	14:17
BATCH ID:	120816A1
DATE ANALYZED:	12/15/2016

COMPOUND NAME	CAS NO.	PPB (V/V) RL	PPB (V/V) SAMPLE CONC	µg/cu. m RL	µg/cu. m SAMPLE CONC
DICHLORODIFLUOROMETHANE	75-71-8	1.00	ND	4.95	ND
CHLOROMETHANE	74-87-3	1.00	ND	2.07	ND
DICHLOROTETRAFLUOROETHANE	76-14-2	1.00	ND	6.99	ND
VINYL CHLORIDE	75-01-4	1.00	ND	2.56	ND
BROMOMETHANE	74-83-9	1.00	ND	3.88	ND
CHLOROETHANE	75-00-3	1.00	ND	2.64	ND
TRICHLOROFLUOROMETHANE	75-69-4	1.00	ND	5.62	ND
1,1-DICHLOROETHENE	75-35-4	1.00	ND	3.97	ND
TRICHLOROTRIFLUOROETHANE	76-13-1	1.00	ND	7.66	ND
METHYLENE CHLORIDE	75-09-2	1.00	ND	3.47	ND
1,1-DICHLOROETHANE	75-34-3	1.00	ND	4.05	ND
CIS-1,2-DICHLOROETHENE	159-59-2	1.00	ND	3.97	ND
CHLOROFORM	67-66-3	1.00	2.81	4.88	13.7
1,1,1-TRICHLOROETHANE	71-55-6	1.00	ND	5.46	ND
1,2-DICHLOROETHANE	107-06-2	1.00	ND	4.05	ND
BENZENE	71-43-2	1.00	4.74	3.19	15.1
CARBON TETRACHLORIDE	56-23-5	1.00	ND	6.29	ND
1,2-DICHLOROPROPANE	78-87-5	1.00	ND	4.62	ND
TRICHLOROETHENE	79-01-6	1.00	ND	5.37	ND
CIS-1,3-DICHLOROPROPENE	10061-01-5	1.00	ND	4.54	ND
TRANS-1,3-DICHLOROPROPENE	10061-02-6	1.00	ND	4.54	ND
TOLUENE	108-88-3	1.00	1.56	3.77	5.88
1,1,2-TRICHLOROETHANE	79-00-5	1.00	ND	5.46	ND
1,2-DIBROMOETHANE	106-93-4	1.00	ND	7.68	ND
TETRACHLOROETHENE	127-18-4	1.00	ND	6.78	ND
CHLOROBENZENE	108-90-7	1.00	ND	4.60	ND
ETHYLBENZENE	100-41-4	1.00	ND	4.34	ND
XYLENE (M+P)	179601-23-1	2.00	ND	8.68	ND
STYRENE	100-42-5	1.00	ND	4.26	ND
XYLENE (O)	95-47-6	1.00	ND	4.34	ND
1,1,2,2-TETRACHLOROETHANE	79-34-5	1.00	ND	6.87	ND
1,3,5-TRIMETHYLBENZENE	108-67-8	1.00	ND	4.92	ND
1,2,4-TRIMETHYLBENZENE	95-63-6	1.00	ND	4.92	ND
1,3-DICHLOROBENZENE	541-73-1	1.00	ND	6.01	ND
1,4-DICHLOROBENZENE	106-46-7	1.00	ND	6.01	ND
1,2-DICHLOROBENZENE	95-50-1	1.00	ND	6.01	ND
1,2,4-TRICHLOROBENZENE	120-82-1	1.00	ND	7.42	ND
HEXACHLOROBUTADIENE	87-68-3	1.00	ND	10.7	ND

NOTES:
ND - NOT DETECTED AT OR ABOVE THE STATED REPORTING LIMIT
RL - REPORTING LIMIT
NA - NOT APPLICABLE OR AVAILABLE
µg/cu. m VALUES ARE CALCULATED FROM PPB RESULTS USING NORMAL TEMPERATURE AND PRESSURE (NPT).

APPROVED BY: _____
DATE: 12/22/16

K PRIME, INC.
LABORATORY REPORT

K PRIME PROJECT: 9946
CLIENT PROJECT: PSAI.OAKLAND

METHOD: VOC'S IN AIR
REFERENCE: EPA METHOD TO 15 (GC-MS-SCAN)

SAMPLE ID:	SG-4
LAB NO:	150209
SAMPLE TYPE:	AIR
DATE SAMPLED:	12/14/2016
TIME SAMPLED:	13:00
BATCH ID:	120816A1
DATE ANALYZED:	12/15/2016

COMPOUND NAME	CAS NO.	PPB (V/V) RL	PPB (V/V) SAMPLE CONC	µg/cu. m RL	µg/cu. m SAMPLE CONC
DICHLORODIFLUOROMETHANE	75-71-8	40.0	ND	198	ND
CHLOROMETHANE	74-87-3	40.0	ND	82.6	ND
DICHLOROTETRAFLUOROETHANE	76-14-2	40.0	ND	280	ND
VINYL CHLORIDE	75-01-4	40.0	ND	102	ND
BROMOMETHANE	74-83-9	40.0	ND	155	ND
CHLOROETHANE	75-00-3	40.0	ND	106	ND
TRICHLOROFLUOROMETHANE	75-69-4	40.0	ND	225	ND
1,1-DICHLOROETHENE	75-35-4	40.0	ND	159	ND
TRICHLOROTRIFLUOROETHANE	76-13-1	40.0	ND	307	ND
METHYLENE CHLORIDE	75-09-2	40.0	ND	139	ND
1,1-DICHLOROETHANE	75-34-3	40.0	ND	162	ND
CIS-1,2-DICHLOROETHENE	159-59-2	40.0	ND	159	ND
CHLOROFORM	67-66-3	40.0	ND	195	ND
1,1,1-TRICHLOROETHANE	71-55-6	40.0	ND	218	ND
1,2-DICHLOROETHANE	107-06-2	40.0	ND	162	ND
BENZENE	71-43-2	40.0	ND	128	ND
CARBON TETRACHLORIDE	56-23-5	40.0	ND	252	ND
1,2-DICHLOROPROPANE	78-87-5	40.0	ND	185	ND
TRICHLOROETHENE	79-01-6	40.0	ND	215	ND
CIS-1,3-DICHLOROPROPENE	10061-01-5	40.0	ND	182	ND
TRANS-1,3-DICHLOROPROPENE	10061-02-6	40.0	ND	182	ND
TOLUENE	108-88-3	40.0	ND	151	ND
1,1,2-TRICHLOROETHANE	79-00-5	40.0	ND	218	ND
1,2-DIBROMOETHANE	106-93-4	40.0	ND	307	ND
TETRACHLOROETHENE	127-18-4	40.0	ND	271	ND
CHLOROBENZENE	108-90-7	40.0	ND	184	ND
ETHYLBENZENE	100-41-4	40.0	ND	174	ND
XYLENE (M+P)	179601-23-1	80.0	ND	347	ND
STYRENE	100-42-5	40.0	ND	170	ND
XYLENE (O)	95-47-6	40.0	ND	174	ND
1,1,2,2-TETRACHLOROETHANE	79-34-5	40.0	ND	275	ND
1,3,5-TRIMETHYLBENZENE	108-67-8	40.0	41.1	197	202
1,2,4-TRIMETHYLBENZENE	95-63-6	40.0	40.8	197	201
1,3-DICHLOROBENZENE	541-73-1	40.0	ND	241	ND
1,4-DICHLOROBENZENE	106-46-7	40.0	ND	241	ND
1,2-DICHLOROBENZENE	95-50-1	40.0	ND	241	ND
1,2,4-TRICHLOROBENZENE	120-82-1	40.0	ND	297	ND
HEXACHLOROBUTADIENE	87-68-3	40.0	ND	427	ND

NOTES:
ND - NOT DETECTED AT OR ABOVE THE STATED REPORTING LIMIT
RL - REPORTING LIMIT
NA - NOT APPLICABLE OR AVAILABLE
µg/cu. m VALUES ARE CALCULATED FROM PPB RESULTS USING NORMAL TEMPERATURE AND PRESSURE (NPT).

APPROVED BY: RMC
DATE: 12/22/16

K PRIME, INC.

LABORATORY REPORT

K PRIME PROJECT: 9946
CLIENT PROJECT: PSAI.OAKLAND

METHOD: METHANE
REFERENCE: EPA METHOD 18

SAMPLE TYPE: AIR
UNITS: PPMV

SAMPLE ID	LAB NO.	DATE SAMPLED	TIME SAMPLED	BATCH ID	DATE ANALYZED	MRL	SAMPLE CONC
SG-1	150206	12/14/2016	14:50	121516A1	12/15/2016	20.0	134000
SG-2	150207	12/14/2016	15:19	121516A1	12/15/2016	10.0	30.1
SG-3	150208	12/14/2016	14:17	121516A1	12/15/2016	10.0	32.6
SG-4	150209	12/14/2016	13:00	121516A1	12/15/2016	10.0	212

NOTES:
ND - NOT DETECTED AT OR ABOVE THE STATED METHOD REPORTING LIMIT
NA - NOT APPLICABLE OR AVAILABLE
MRL - METHOD REPORTING LIMIT

APPROVED BY: MC
DATE: 12/22/16

K PRIME, INC.
LABORATORY REPORT

K PRIME PROJECT: 9946
CLIENT PROJECT: PSAI.OAKLAND

METHOD: HELIUM
REFERENCE: ASTM D 1946

SAMPLE TYPE: AIR
UNITS: %-V

SAMPLE ID	LAB NO	BATCH NO	DATE SAMPLED	TIME SAMPLED	DATE ANALYZED	MRL	SAMPLE CONC
SG-1	150206	120916A2	12/14/2016	14:50	12/15/2016	0.100	0.318
SG-2	150207	120916A2	12/14/2016	15:19	12/15/2016	0.100	1.81
SG-3	150208	120916A2	12/14/2016	14:17	12/15/2016	0.100	0.932
SG-4	150209	120916A2	12/14/2016	13:00	12/15/2016	0.100	0.688

NOTES:
ND - NOT DETECTED AT OR ABOVE THE STATED METHOD REPORTING LIMIT
NA - NOT APPLICABLE OR AVAILABLE
MRL - METHOD REPORTING LIMIT

APPROVED BY: _____
DATE: 12/22/16

K PRIME, INC.
LABORATORY METHOD BLANK REPORT

METHOD BLANK ID: B120816A1
SAMPLE TYPE: AIR

BATCH ID: 120816A1
DATE ANALYZED: 12/08/2016

METHOD: VOC'S IN AIR
REFERENCE: EPA METHOD TO 15 (GC-MS-SCAN)

		PPB (V/V)		µg/cu. m	
COMPOUND NAME	**CAS NO.**	**RL**	**SAMPLE CONC**	**RL**	**SAMPLE CONC**
DICHLORODIFLUOROMETHANE	75-71-8	0.500	ND	2.47	ND
CHLOROMETHANE	74-87-3	0.500	ND	1.03	ND
DICHLOROTETRAFLUOROETHANE	76-14-2	0.500	ND	3.50	ND
VINYL CHLORIDE	75-01-4	0.500	ND	1.28	ND
BROMOMETHANE	74-83-9	0.500	ND	1.94	ND
CHLOROETHANE	75-00-3	0.500	ND	1.32	ND
TRICHLOROFLUOROMETHANE	75-69-4	0.500	ND	2.81	ND
1,1-DICHLOROETHENE	75-35-4	0.500	ND	1.98	ND
TRICHLOROTRIFLUOROETHANE	76-13-1	0.500	ND	3.83	ND
METHYLENE CHLORIDE	75-09-2	0.500	ND	1.74	ND
1,1-DICHLOROETHANE	75-34-3	0.500	ND	2.02	ND
CIS-1,2-DICHLOROETHENE	159-59-2	0.500	ND	1.98	ND
CHLOROFORM	67-66-3	0.500	ND	2.44	ND
1,1,1-TRICHLOROETHANE	71-55-6	0.500	ND	2.73	ND
1,2-DICHLOROETHANE	107-06-2	0.500	ND	2.02	ND
BENZENE	71-43-2	0.500	ND	1.60	ND
CARBON TETRACHLORIDE	56-23-5	0.500	ND	3.15	ND
1,2-DICHLOROPROPANE	78-87-5	0.500	ND	2.31	ND
TRICHLOROETHENE	79-01-6	0.500	ND	2.69	ND
CIS-1,3-DICHLOROPROPENE	10061-01-5	0.500	ND	2.27	ND
TRANS-1,3-DICHLOROPROPENE	10061-02-6	0.500	ND	2.27	ND
TOLUENE	108-88-3	0.500	ND	1.88	ND
1,1,2-TRICHLOROETHANE	79-00-5	0.500	ND	2.73	ND
1,2-DIBROMOETHANE	106-93-4	0.500	ND	3.84	ND
TETRACHLOROETHENE	127-18-4	0.500	ND	3.39	ND
CHLOROBENZENE	108-90-7	0.500	ND	2.30	ND
ETHYLBENZENE	100-41-4	0.500	ND	2.17	ND
XYLENE (M+P)	179601-23-1	1.00	ND	4.34	ND
STYRENE	100-42-5	0.500	ND	2.13	ND
XYLENE (O)	95-47-6	0.500	ND	2.17	ND
1,1,2,2-TETRACHLOROETHANE	79-34-5	0.500	ND	3.43	ND
1,3,5-TRIMETHYLBENZENE	108-67-8	0.500	ND	2.46	ND
1,2,4-TRIMETHYLBENZENE	95-63-6	0.500	ND	2.46	ND
1,3-DICHLOROBENZENE	541-73-1	0.500	ND	3.01	ND
1,4-DICHLOROBENZENE	106-46-7	0.500	ND	3.01	ND
1,2-DICHLOROBENZENE	95-50-1	0.500	ND	3.01	ND
1,2,4-TRICHLOROBENZENE	120-82-1	0.500	ND	3.71	ND
HEXACHLOROBUTADIENE	87-68-3	0.500	ND	5.33	ND

NOTES:
ND - NOT DETECTED AT OR ABOVE THE STATED REPORTING LIMIT
MRL - METHOD REPORTING LIMIT
NA - NOT APPLICABLE OR AVAILABLE
µg/cu. m VALUES ARE CALCULATED FROM PPB RESULTS USING NORMAL TEMPERATURE AND PRESSURE (NPT).

K PRIME, INC.
LABORATORY QUALITY CONTROL REPORT

LAB CONTROL ID: L120816A1
LAB CONTROL DUPLICATE ID: D120816A1

SAMPLE TYPE: AIR
BATCH ID: 120816A1
DATE ANALYZED: 12/08/2016

METHOD: VOC'S IN AIR
REFERENCE: EPA METHOD TO 15 (GC-MS-SCAN)

COMPOUND NAME	SPIKE ADDED (PPB)	REPORTING LIMIT (PPB)	SAMPLE CONC (PPB)	SPIKE CONC (PPB)	SPIKE REC (%)	REC LIMITS (%)
1,1-DICHLOROETHENE	10.0	0.500	ND	10.2	102	60 - 140
BENZENE	10.0	0.500	ND	9.29	93	60 - 140
TRICHLOROETHENE	10.0	0.500	ND	10.6	106	60 - 140
TOLUENE	10.0	0.500	ND	10.6	106	60 - 140
TETRACHLOROETHENE	10.0	0.500	ND	10.6	106	60 - 140

COMPOUND NAME	SPIKE ADDED (PPB)	SPIKE DUP CONC (PPB)	SPIKE DUP REC (%)	RPD (%)	QC LIMITS RPD (%)	QC LIMITS REC (%)
1,1-DICHLOROETHENE	10.0	10.7	107	5.2	25	60 - 140
BENZENE	10.0	9.71	97	4.4	25	60 - 140
TRICHLOROETHENE	10.0	10.8	108	1.2	25	60 - 140
TOLUENE	10.0	11.0	110	3.8	25	60 - 140
TETRACHLOROETHENE	10.0	10.9	109	2.7	25	60 - 140

NOTES:
NA - NOT APPLICABLE OR AVAILABLE
ND - NOT DETECTED AT OR ABOVE THE STATED REPORTING LIMIT

K PRIME, INC.
LABORATORY QC REPORT

METHOD BLANK ID: B121516A1
LAB CONTROL SAMPLE ID: L121516A1
LAB CONTROL DUPLICATE ID: D121516A1
BATCH ID: 121516A1

METHOD: METHANE
REFERENCE: EPA METHOD 18

SAMPLE TYPE: AIR
UNITS: PPM -V/V

METHOD BLANK

COMPOUND NAME	REPORTING LIMIT	SAMPLE CONC
METHANE	10.0	ND

ACCURACY (LAB CONTROL SAMPLE)

COMPOUND NAME	EXPECTED CONC	MEASURED CONC	PERCENT RECOVERY	LIMITS (PERCENT)
METHANE	1000	1050	105	60-140

PRECISION (LAB CONTROL DUPLICATE)

COMPOUND NAME	SAMPLE RESULT	DUPLICATE RESULT	RPD (PERCENT)	LIMITS (PERCENT)
METHANE	1050	1070	1.89	±30

NOTES:
ND - NOT DETECTED AT OR ABOVE THE STATED METHOD REPORTING LIMIT
NA - NOT APPLICABLE OR AVAILABLE

K PRIME, INC.
LABORATORY BATCH QC REPORT

SAMPLE ID: B120916A2
SPIKE ID: L120916A2
DUPLICATE ID: D120916A2
BATCH NO: 120916A2
DATE ANALYZED: 12/09/2016

METHOD: HELIUM
REFERENCE: ASTM D 1946

SAMPLE TYPE: AIR
UNITS: %-V

METHOD BLANK

COMPOUND NAME	REPORTING LIMIT	SAMPLE RESULT
HELIUM	0.050	ND

ACCURACY (MATRIX SPIKE)

COMPOUND NAME	SPIKE ADDED	SAMPLE RESULT	SPIKE RESULT	RECOVERY (%)	LIMITS (%)
HELIUM	10.0	ND	9.40	94.0	70-130

PRECISION (SPIKE DUPLICATE)

COMPOUND NAME	REPORTING LIMIT	SPIKE RESULT	DUPLICATE RESULT	RPD (%)	LIMITS (%)
HELIUM	0.050	9.40	9.50	1.06	±20

NOTES:
ND - NOT DETECTED AT OR ABOVE THE STATED REPORTING LIMIT
NA - NOT AVAILABLE OR APPLICABLE

WEST
Environmental Services & Technology
711 Grand Avenue, Suite 220
San Rafael, California 94901
415.460.6770 • Fax 415.460.6771
main@westenvironmental.com

SAMPLE ANALYSIS/COMPOSITE REQUEST FORM

CHAIN-OF-CUSTODY

Invoice to: WEST, Inc.	Date: 12/15/16	Page 1 of 1
Project: PSAI.Oakland	Location: 1708 Wood Street, Oakland, CA	
Project Manager: Peter Morris, WEST, Inc.	Phone: 415/460-6770	Fax: 415/460-6771
Laboratory: KPrime, Inc, Santa Rosa, CA	Turnaround time (days): 1 / 2 / 3 / 5 / 7 / 10 / Std. X	
Sampler Signature:	Analyses Requested	

Sample ID	Summa ID	Date	Time	Type	# Containers	Composite	VOCs (TO-15A)	Helium (ASTM D1946)	Methane (TO-3)	KPI #	HOLD
SG-1	S-851	12/14/16	1436 / 1450	A	1	1	X	X	X	150206	
SG-2	S-855	12/14/16	1512 / 1519	A	1	1	X	X	X	150207	
SG-3	S-520	12/14/16	1410 / 1417	A	1	1	X	X	X	150208	
SG-4	S-857	12/14/16	1253 / 1300	A	1	1	X	X	X	150209	

NOTES:

☐ EDF Log Code: WESS

Global ID: _____

Relinquished by: (Signature)	Date/Time 12/15/16 8:57	Received by: (Signature) Ben Browning	Date/Time 12/15/16 8:57
Relinquished by: (Signature) Ben Browning	Date/Time 12/15/16 10:21	Received by: (Signature) Myrtle Rochelle	Date/Time 12/15/16 10:21

WEST
Environmental Services & Technology

SOIL VAPOR SAMPLING LOG, SAMPLE ID: SG-1

PROJECT NAME:	PSA1. Oakland				
PROJECT LOCATION:	1708 Wood St, Oakland				
WEATHER:	Overcast; low 60's, slight South breeze				
DATE:	December 14, 2016				
SAMPLED BY:	RLM				
WELL TYPE, e.g., PERMANENT; TEMPORARY:	Temporary				
SAMPLE DATA	SAMPLE ID:	SG-1			
	VAPOR PROBE SAMPLE DEPTH (FT):	1			
	SUMMA CANISTER ID:	S-851			
	FLOW CONTROLLER SERIAL NO.:	—			
PURGE VOLUME CALCULATION	BORING/WELL DIAMETER (INCH):	2.25			
	DRY BENTONITE INTERVAL (FT)	0.3-0.5			
	SAND PACK INTERVAL (FT):	0.5-1			
	TUBING TYPE:	Teflon			
	TUBING LENGTH (FT):	3			
	TUBING ID (INCH):	0.17			
	PURGE VOLUME (CC):	121			
	PURGE RATE (CC/MIN):	125			
	PURGE TIME 1 WELL VOLUME (MIN):	1.0			
	PURGE WELL VOLUMES (CIRCLE)	1	3	7	10
	PURGE TIME (MIN):	1.0	3.0	—	—
SHUT IN/ 10-MINUTE VACUUM TEST	VACUUM HOLD TEST START TIME (24 HR):	1420			
	INITIAL CANISTER VACUUM (IN. Hg)	6			
	VACUUM HOLD TEST END TIME (24 HR):	1430			
	VACUUM HOLD TEST DURATION (MIN):	10			
	FINAL CANISTER VACUUM (IN. Hg):	6			
PURGE AND SAMPLE TRAIN LEAK TEST	MEASUREMENTS WITHIN SHROUD	TIME (24 HR)	HELIUM (%)		
	PRIOR TO PURGE	1431	28.1		
	DURING PURGE	1434	23.9		
	POST PURGE	1436			
	MEASUREMENTS FROM SAMPLING TRAIN	TIME (24 HR)	HELIUM (%)	PID (PPMV)	
	PURGE START	1432	0	0.2	
	1 WELL VOLUME	1433	0	0.2	
	3 WELL VOLUMES	1435	0		
	7 WELL VOLUMES	—	—	—	
	10 WELL VOLUMES	—	—	—	

WEST
Environmental Services & Technology

SOIL VAPOR SAMPLING LOG, SAMPLE ID: SG-1

PROJECT NAME:	PSAI Oakland
PROJECT LOCATION:	1708 Wood St, Oakland, CA
DATE:	December 14, 2016

SAMPLE COLLECTION AND TRACER GAS MONITORING

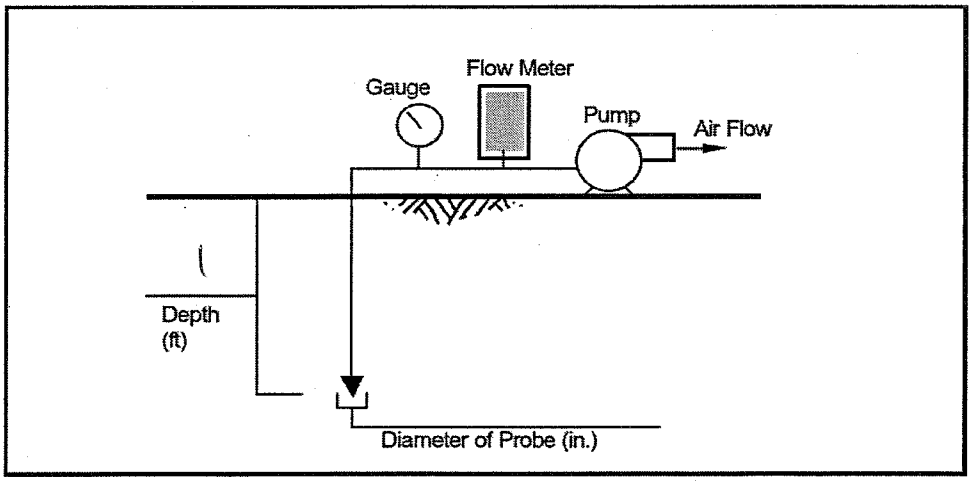
INITIAL CANISTER VACUUM (IN. Hg)	28
TIME CANISTER OPENED (24 HR) 5-891	1436

APPLY TRACER GAS WITHIN THE SHROUD

TIME (MINS)	HELIUM (%)	VACUUM (IN. Hg)
2	20.9	24
4	21.5	20
6	21.1	17
8	22.1	13
10	20.7	10
15	—	—
20	—	—
30	—	—
40	—	—
50	—	—
60	—	—

TIME CANISTER CLOSED (24 HR)	1450
FINAL CANISTER PRESSURE (IN. Hg):	4
TOTAL SAMPLE TIME (MINS):	14

INTRINSIC PERMEABILITY TESTING



TEST THRU WELL TUBING/NO MANIFOLD	TEST 1	TEST 2	TEST 3	TEST 4
VACUUM (IN. WATER)	—			
FLOW METER READING	—			
FLOW RATE (CC/MIN)	—			
LENGTH OF TEST (SEC)	—			

WEST
Environmental Services & Technology

SOIL VAPOR SAMPLING LOG, SAMPLE ID: SG-2

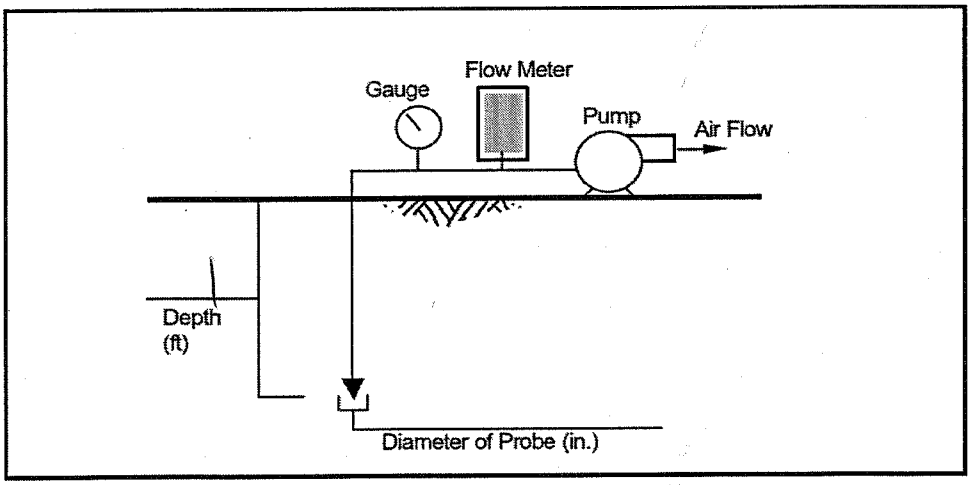
PROJECT NAME:	PSAI. Oakland				
PROJECT LOCATION:	1708 Wood St, Oakland, CA				
WEATHER:	Overcast				
DATE:	December 14, 2016				
SAMPLED BY:	RLM				
WELL TYPE, e.g., PERMANENT; TEMPORARY:	Temporary				
SAMPLE DATA	SAMPLE ID:	SG-2			
	VAPOR PROBE SAMPLE DEPTH (FT):	1			
	SUMMA CANISTER ID:	S-855			
	FLOW CONTROLLER SERIAL NO.:	—			
PURGE VOLUME CALCULATION	BORING/WELL DIAMETER (INCH):	2.25			
	DRY BENTONITE INTERVAL (FT)	0.3 to 0.5			
	SAND PACK INTERVAL (FT):	0.5 to 1			
	TUBING TYPE:	Teflon			
	TUBING LENGTH (FT):	3			
	TUBING ID (INCH):	0.17			
	PURGE VOLUME (CC):	121			
	PURGE RATE (CC/MIN):	125			
	PURGE TIME 1 WELL VOLUME (MIN):	1.0			
	PURGE WELL VOLUMES (CIRCLE)	1	3	7	10
	PURGE TIME (MIN):	1.0	3.0	—	—
SHUT IN/ 10-MINUTE VACUUM TEST	VACUUM HOLD TEST START TIME (24 HR):	1456			
	INITIAL CANISTER VACUUM (IN. Hg)	12			
	VACUUM HOLD TEST END TIME (24 HR):	1506			
	VACUUM HOLD TEST DURATION (MIN):	10			
	FINAL CANISTER VACUUM (IN. Hg):	12			
PURGE AND SAMPLE TRAIN LEAK TEST	MEASUREMENTS WITHIN SHROUD	TIME (24 HR)	HELIUM (%)		
	PRIOR TO PURGE	1507	30.1		
	DURING PURGE	1510	22.1		
	POST PURGE	1512	21.6		
	MEASUREMENTS FROM SAMPLING TRAIN	TIME (24 HR)	HELIUM (%)	PID (PPMV)	
	PURGE START	1508	0	0.2	
	1 WELL VOLUME	1509	0	0.2	
	3 WELL VOLUMES	1511	0	0.2	
	7 WELL VOLUMES	—	—	—	
	10 WELL VOLUMES	—	—	—	

WEST
Environmental Services & Technology

SOIL VAPOR SAMPLING LOG, SAMPLE ID: SG-2

PROJECT NAME:	PSAT. Oakland				
PROJECT LOCATION:	1708 Wood St, Oakland, CA				
DATE:	December 14, 2016				
SAMPLE COLLECTION AND TRACER GAS MONITORING	INITIAL CANISTER VACUUM (IN. Hg)	.30			
	TIME CANISTER OPENED (24 HR) 5-855	1512			
	APPLY TRACER GAS WITHIN THE SHROUD	TIME (MINS)	HELIUM (%)	VACUUM (IN. Hg)	
		2	21.4	22	
		4	20.0	15	
		6	21.6	7	
		8	—	—	
		10	—	—	
		15	—	—	
		20	—	—	
		30	—	—	
		40	—	—	
		50	—	—	
		60	—	—	
	TIME CANISTER CLOSED (24 HR)	1519			
	FINAL CANISTER PRESSURE (IN. Hg):				
	TOTAL SAMPLE TIME (MINS):	7			

INTRINSIC PERMEABILITY TESTING



TEST THRU WELL TUBING/NO MANIFOLD	TEST 1	TEST 2	TEST 3	TEST 4
VACUUM (IN. WATER)	—			
FLOW METER READING	—			
FLOW RATE (CC/MIN)	—			
LENGTH OF TEST (SEC)	—			

WEST
Environmental Services & Technology

SOIL VAPOR SAMPLING LOG, SAMPLE ID: SG-3

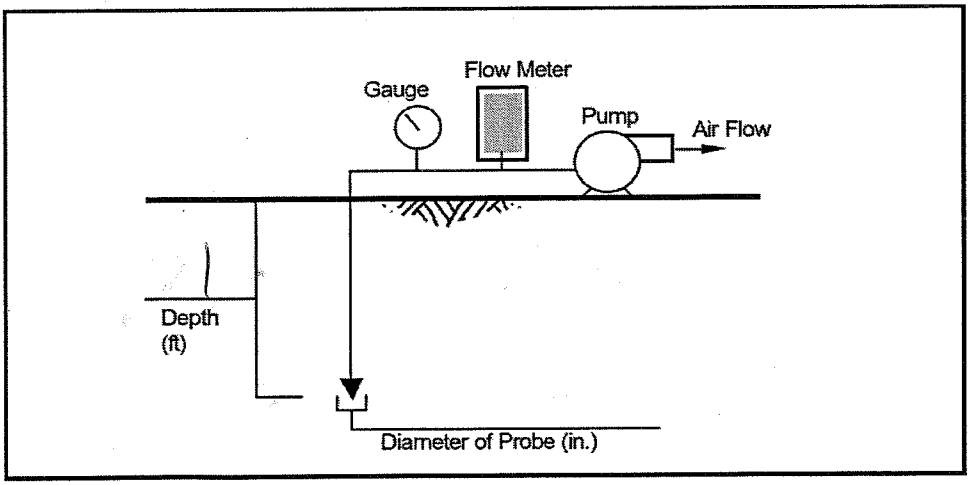
PROJECT NAME:	PSAI. Oakland				
PROJECT LOCATION:	1708 Wood St, Oakland				
WEATHER:	Overcast, sprinkling				
DATE:	December 14, 2016				
SAMPLED BY:	RLM				
WELL TYPE, e.g., PERMANENT; TEMPORARY:	Temporary				
SAMPLE DATA	SAMPLE ID:	SG-3			
	VAPOR PROBE SAMPLE DEPTH (FT):	1			
	SUMMA CANISTER ID:	S-520			
	FLOW CONTROLLER SERIAL NO.:	—			
PURGE VOLUME CALCULATION	BORING/WELL DIAMETER (INCH):	2.25			
	DRY BENTONITE INTERVAL (FT)	0.3-0.5			
	SAND PACK INTERVAL (FT):	0.5-1			
	TUBING TYPE:	Teflon			
	TUBING LENGTH (FT):	3			
	TUBING ID (INCH):	0.17			
	PURGE VOLUME (CC):	121			
	PURGE RATE (CC/MIN):	125			
	PURGE TIME 1 WELL VOLUME (MIN):	1.0			
	PURGE WELL VOLUMES (CIRCLE)	1	3	7	10
	PURGE TIME (MIN):	1.0	3.0	—	—
SHUT IN/ 10-MINUTE VACUUM TEST	VACUUM HOLD TEST START TIME (24 HR):	1355			
	INITIAL CANISTER VACUUM (IN. Hg)	10			
	VACUUM HOLD TEST END TIME (24 HR):	1405			
	VACUUM HOLD TEST DURATION (MIN):	10			
	FINAL CANISTER VACUUM (IN. Hg):	10			
PURGE AND SAMPLE TRAIN LEAK TEST	MEASUREMENTS WITHIN SHROUD	TIME (24 HR)	HELIUM (%)		
	PRIOR TO PURGE	1405	29.5		
	DURING PURGE	—	—		
	POST PURGE	1410	20.9		
	MEASUREMENTS FROM SAMPLING TRAIN	TIME (24 HR)	HELIUM (%)	PID (PPMV)	
	PURGE START	1406	0	0.1	
	1 WELL VOLUME	1407	0	0.1	
	3 WELL VOLUMES	1409	0	0.1	
	7 WELL VOLUMES	—	—	—	
	10 WELL VOLUMES	—	—	—	

WEST
Environmental Services & Technology

SOIL VAPOR SAMPLING LOG, SAMPLE ID: SG-3

PROJECT NAME:	PSAI. Oakland				
PROJECT LOCATION:	1708 Wood St, Oakland				
DATE:	December 14, 2016				
SAMPLE COLLECTION AND TRACER GAS MONITORING	INITIAL CANISTER VACUUM (IN. Hg)	29			
	TIME CANISTER OPENED (24 HR) S-920	1410			
	APPLY TRACER GAS WITHIN THE SHROUD	TIME (MINS)	HELIUM (%)	VACUUM (IN. Hg)	
		2	21.7	22	
		4	20.1	14	
		6	21.8	7	
		8	—	—	
		10	—	—	
		15	—	—	
		20	—	—	
		30	—	—	
		40	—	—	
		50	—	—	
		60	—	—	
	TIME CANISTER CLOSED (24 HR)	1417			
	FINAL CANISTER PRESSURE (IN. Hg):	4			
	TOTAL SAMPLE TIME (MINS):	7			

INTRINSIC PERMEABILITY TESTING



TEST THRU WELL TUBING/NO MANIFOLD	TEST 1	TEST 2	TEST 3	TEST 4
VACUUM (IN. WATER)	—			
FLOW METER READING	—			
FLOW RATE (CC/MIN)	—			
LENGTH OF TEST (SEC)	—			

WEST
Environmental Services & Technology

SOIL VAPOR SAMPLING LOG, SAMPLE ID: SG-4

PROJECT NAME:	PSAI Oakland				
PROJECT LOCATION:	1708 Wood St, Oakland				
WEATHER:	Overcast				
DATE:	December 14, 2016				
SAMPLED BY:	RLM				
WELL TYPE, e.g., PERMANENT; TEMPORARY:	Temporary				
SAMPLE DATA	SAMPLE ID:	SG-4			
	VAPOR PROBE SAMPLE DEPTH (FT):	1			
	SUMMA CANISTER ID:	S-857			
	FLOW CONTROLLER SERIAL NO.:				
PURGE VOLUME CALCULATION	BORING/WELL DIAMETER (INCH):	2.25			
	DRY BENTONITE INTERVAL (FT)	0.3-0.5			
	SAND PACK INTERVAL (FT):	0.5-1			
	TUBING TYPE:	Teflon			
	TUBING LENGTH (FT):	3			
	TUBING ID (INCH):	0.17			
	PURGE VOLUME (CC):	121			
	PURGE RATE (CC/MIN):	125			
	PURGE TIME 1 WELL VOLUME (MIN):	1.0			
	PURGE WELL VOLUMES (CIRCLE)	1	3	7	10
	PURGE TIME (MIN):	1.0	3.0	—	—
SHUT IN/ 10-MINUTE VACUUM TEST	VACUUM HOLD TEST START TIME (24 HR):	1236			
	INITIAL CANISTER VACUUM (IN. Hg)	8			
	VACUUM HOLD TEST END TIME (24 HR):	1246			
	VACUUM HOLD TEST DURATION (MIN):	10			
	FINAL CANISTER VACUUM (IN. Hg):	8			

PURGE AND SAMPLE TRAIN LEAK TEST	MEASUREMENTS WITHIN SHROUD	TIME (24 HR)	HELIUM (%)		
	PRIOR TO PURGE	1247	22.5		
	DURING PURGE	1251	20.4		
	POST PURGE	1253	21.4		
	MEASUREMENTS FROM SAMPLING TRAIN	TIME (24 HR)	HELIUM (%)	PID (PPMV)	
	PURGE START	1249	0	0.2	
	1 WELL VOLUME	1250	0	0.1	
	3 WELL VOLUMES	1252	0	0.1	
	7 WELL VOLUMES	—	—	—	
	10 WELL VOLUMES	—	—	—	

WEST
Environmental Services & Technology

SOIL VAPOR SAMPLING LOG, SAMPLE ID: SG-4

PROJECT NAME:	PSAI-Oakland
PROJECT LOCATION:	1708 Wood St Oakland
DATE:	December 14, 2016

SAMPLE COLLECTION AND TRACER GAS MONITORING

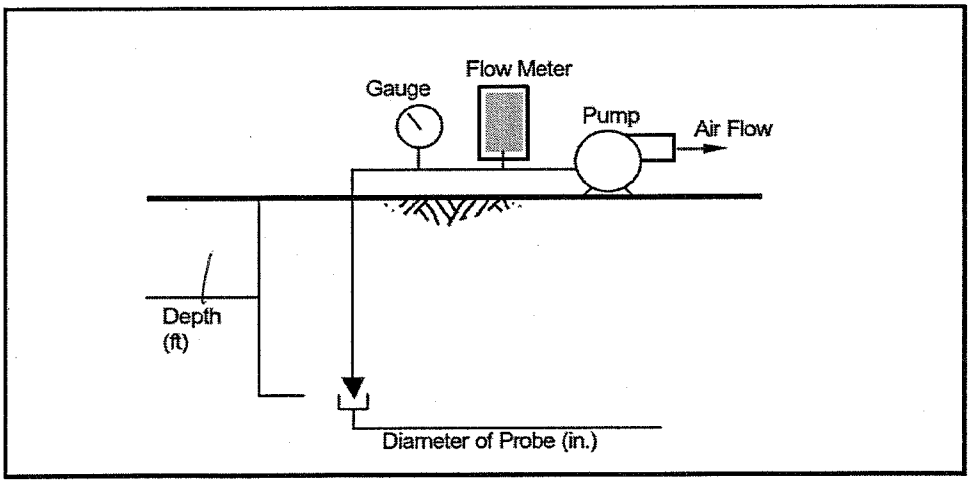
INITIAL CANISTER VACUUM (IN. Hg)	30
TIME CANISTER OPENED (24 HR) S-057	1253

APPLY TRACER GAS WITHIN THE SHROUD

TIME (MINS)	HELIUM (%)	VACUUM (IN. Hg)
2	20.4	24
4	22.1	15
6	20.7	8
8	—	—
10	—	—
15	—	—
20	—	—
30	—	—
40	—	—
50	—	—
60	—	—

TIME CANISTER CLOSED (24 HR)	1300
FINAL CANISTER PRESSURE (IN. Hg):	4
TOTAL SAMPLE TIME (MINS):	7

INTRINSIC PERMEABILITY TESTING



TEST THRU WELL TUBING/NO MANIFOLD	TEST 1	TEST 2	TEST 3	TEST 4
VACUUM (IN. WATER)	—			
FLOW METER READING	—			
FLOW RATE (CC/MIN)	—			
LENGTH OF TEST (SEC)	—			

APPENDIX D

CALCULATIONS

TABLE D-1
95-PERCENT UCL LEAD
1708 Wood Street
Oakland, California

Total Number of Observations	25	Number of Distinct Observations	23
		Number of Missing Observations	0
Minimum	3.2	Mean	1004
Maximum	14000	Median	100
SD	2896	Std. Error of Mean	579.2
Coefficient of Variation	2.885	Skewness	4.167
Normal GOF Test			
Shapiro Wilk Test Statistic	0.389	Shapiro Wilk GOF Test	
5% Shapiro Wilk Critical Value	0.918	Data Not Normal at 5% Significance Level	
Lilliefors Test Statistic	0.371	Lilliefors GOF Test	
5% Lilliefors Critical Value	0.177	Data Not Normal at 5% Significance Level	
Data Not Normal at 5% Significance Level			
Assuming Normal Distribution			
95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	1995	95% Adjusted-CLT UCL (Chen-1995)	2472
		95% Modified-t UCL (Johnson-1978)	2075
Gamma GOF Test			
A-D Test Statistic	1.641	Anderson-Darling Gamma GOF Test	
5% A-D Critical Value	0.865	Data Not Gamma Distributed at 5% Significance Level	
K-S Test Statistic	0.196	Kolmogrov-Smirnoff Gamma GOF Test	
5% K-S Critical Value	0.191	Data Not Gamma Distributed at 5% Significance Level	
Data Not Gamma Distributed at 5% Significance Level			
Gamma Statistics			
k hat (MLE)	0.273	k star (bias corrected MLE)	0.267
Theta hat (MLE)	3674	Theta star (bias corrected MLE)	3758
nu hat (MLE)	13.66	nu star (bias corrected)	13.36
MLE Mean (bias corrected)	1004	MLE Sd (bias corrected)	1942
		Approximate Chi Square Value (0.05)	6.133
Adjusted Level of Significance	0.0395	Adjusted Chi Square Value	5.801
Assuming Gamma Distribution			
95% Approximate Gamma UCL (use when n>=50))	2186	95% Adjusted Gamma UCL (use when n<50)	2311
Lognormal GOF Test			
Shapiro Wilk Test Statistic	0.942	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.918	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.123	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.177	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	1.163	Mean of logged Data	4.349
Maximum of Logged Data	9.547	SD of logged Data	2.404
Assuming Lognormal Distribution			
95% H-UCL	13594	90% Chebyshev (MVUE) UCL	2829
95% Chebyshev (MVUE) UCL	3668	97.5% Chebyshev (MVUE) UCL	4831

TABLE D-1
95-PERCENT UCL LEAD
1708 Wood Street
Oakland, California

99% Chebyshev (MVUE) UCL	7116

Nonparametric Distribution Free UCL Statistics
Data appear to follow a Discernible Distribution at 5% Significance Level

Nonparametric Distribution Free UCLs

95% CLT UCL	1957	95% Jackknife UCL	1995
95% Standard Bootstrap UCL	1950	95% Bootstrap-t UCL	6127
95% Hall's Bootstrap UCL	5293	95% Percentile Bootstrap UCL	1973
95% BCA Bootstrap UCL	2612		
90% Chebyshev(Mean, Sd) UCL	2742	95% Chebyshev(Mean, Sd) UCL	3529
97.5% Chebyshev(Mean, Sd) UCL	4621	99% Chebyshev(Mean, Sd) UCL	6767

Suggested UCL to Use

97.5% Chebyshev (Mean, Sd) UCL	4621

TABLE D-2
WORKER PROTECTION ACTION LEVELS - LEAD AND DUST
1708 Wood Street
Oakland, California

Chemicals of Concern	Soil RME	Threshold Limits			Minimum Screening Level	Action Level	MiniRam Real Time Air Measurements	
		Cal OSHA PEL	NAAQS[a]	CAAQS[b]			Dust Threshold	Dust Action Level
	(mg/kg)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)	(mg/m^3)
Lead (Max Concentration)	14,000	0.05	--	--	0.05	0.03	4	1.8
Lead (95-percent UCL; Table D-1)	4,600	0.05			0.05	0.03	10.9	6.5
Respirable Dust (Worker)	--	5	--	--	5.0	2.5	5.0	2.5
Respirable Dust (Perimeter)	--	--	0.15	0.05	0.05	0.05	0.05	0.05

Notes:
mg/kg: milligrams per kilogram
mg/m^3: milligrams per cubic meter
OSHA: Occupational Safety and Health Administration
PEL: Permissible Exposure Limit
TWA: Time weighted average for an 8-hour work shift, 40-hour work week

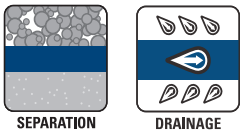
a: National Ambient Air Quality Standards (NAAQS) is 0.15 mg/m^3 for a 24-hour period; and 0.05 mg/m^3 for an annual arithmetic mean

b: California Ambient Air Quality Standards (CAAQS) is 0.05 mg/m^3 for a 24-hour period and 0.02 mg/m^3 for an annual arithmetic mean.
UCL: Upper Confidence Level of the Mean Concentration

APPENDIX E

SPECIFICATIONS

TENCATE Mirafi®



Mirafi® Orange Delineation Nonwoven Geotextile

for Visual Barrier, Soil Separation and Drainage

Mirafi® Orange Delineation Geotextiles

TenCate™ develops and produces materials that function to increase performance, reduce costs and deliver measurable results by working with our customers to provide advanced solutions.

The Difference Mirafi® Orange Nonwoven Geotextiles Make:

- Utility Alert. Mirafi® delineation geotextiles are a visual dig barrier designed to be placed above underground utilities.
- Contaminated Soils. Mirafi® delineation geotextiles separate contaminated soils from clean soils.
- Archeological Sites. Mirafi® delineation geotextiles assist in the long-term protection of historical sites.

APPLICATIONS

Mirafi® nonwoven geotextiles are used in a wide variety of applications in the environmental and general civil markets. These include separation, filtration and protection applications.

Mirafi® delineation geotextiles are is used in many critical subsurface systems. The use of this orange delineation fabric allows for safe excavations where utilities or other sensitive structures may be buried. The highly visible orange nonwoven geotextile serves as a warning to construction workers when the excavation reaches a buried structure.

Excavation near all utilities, (gas, electric, water, Cable TV and telephone) is always a sensitive operation. The use of Mirafi® delineation geotextile is a low cost-effective method of protection. In addition, lining trench's with a geotextile keeps the selected and costly backfill material separated from the native subgrade.

Construction in areas where contaminated soils exist poses risks when trenches or deep footings need to be excavated. These risks are minimized when the Mirafi® delineation geotextile is placed on the contaminated soils before the capping of these areas occurs. The geotextile limits particle movement between the clean new soil and the contaminated substrate. The Mirafi® delineation geotextile offers a visual barrier to future excavations of the contaminated hazard below.

Federal and State laws require that archeological sites must be protected from adverse impacts caused by engineering projects. Many archeological sites throughout the world are left in place to protect them. In some cases, after discovery, they are buried. Sites can be protected through burial below an engineered cover, if the engineering project does not require excavation. The installation of Mirafi® delineation geotextile before the new soil is placed will aide in the long term protection of these archeological sites.

* These guidelines serve as a general basis for installation. Detailed instructions are available from your TenCate™ representative.

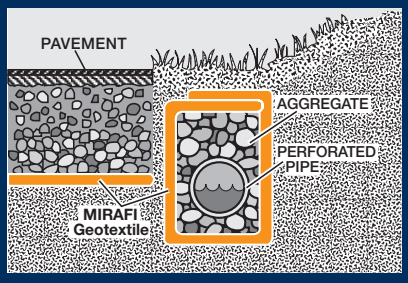
Mirafi® Orange Delineation Nonwoven Geotextiles

for Visual Barrier, Soil Separation and Drainage

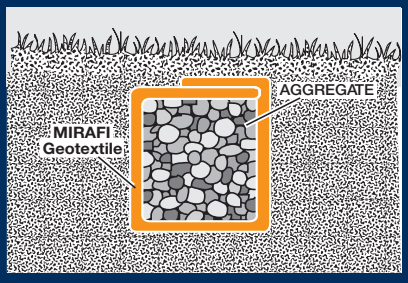
Property / Test Method	Units	140NL	160N	180N
MECHANICAL PROPERTIES				
Grab Tensile Strength ASTM D4632				
Strength @ Ultimate	lbs (N)	100 (445)	175 (779)	240 (1068)
Elongation @ Ultimate	%	75	75	70
Trapezoidal Tear Strength	lbs	50	85	90
ASTM D4533	(N)	(223)	(378)	(400)
CBR Puncture Strength	lbs	310	480	630
ASTM D6241	(N)	(1380)	(2136)	(2802)
UV Resistance after 500 hrs.	% strength	70	80	80
ASTM D4355				
HYDRAULIC PROPERTIES				
Apparent Opening Size (AOS)	US Sieve	70	100	100
ASTM D4751	mm	0.212	0.15	0.15
Permittivity	sec^{-1}	2.4	1.5	1.5
ASTM D4491				
Flow Rate ASTM D4491	$gal/min/ft^2$ ($l/min/m^2$)	175 (7130)	105 (4278)	95 (3870)
Packaging				
Roll Width	ft (m)	15.0 (4.5)	15.0 (4.5)	15.0 (4.5)
Roll Length	ft (m)	360 (110)	300 (91)	300 (91)
Est. Gross Weight	lbs (kg)	143 (165)	215 (97)	265 (120)
Area	yd^2 (m^2)	600 (502)	500 (418)	500 (418)

*NOTE: Mechanical Properties and Hydraulic Properties shown are Typical Value. Apparent Opening Size (AOS) properties shown are Maximum Average Roll Values. (Values and methods could change without notice)

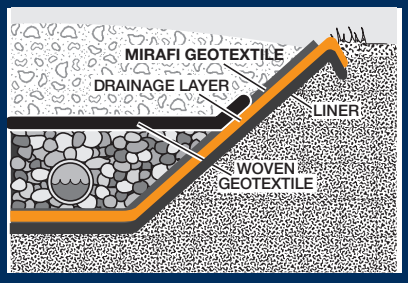
Mirafi® Orange Delineation Geotextiles



Cut-off/Inceptor Drain Along a Roadway Or Another Critical Struction



French Drain Without Pipe



Liner Protection Within a Landfill

PDS.NLO.0911

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Pendergrass, GA 30567

Tel 800 685 9990
Tel 706 693 2226

Fax 706 693 4400
www.mirafi.com

ISO 9001
FM 61026

TENCATE™
materials that make a difference

GEOVENT™

ACTIVE/PASSIVE GAS VENTING SYSTEM

GEOVENT™ allows for ease of installation directly on the subgrade, eliminating the need for costly and labor-intensive trenching.

GEOVENT™ allows for ease of installation directly on the subgrade, eliminating the need for costly and labor-intensive trenching.

DESCRIPTION

GEOVENT™ consists of a three-dimensional vent core that is wrapped in a non-woven, needle-punched filter fabric.

GEOVENT End Outlets are available for use in conjunction with GEOVENT active/passive gas venting systems.

APPLICATION

GEOVENT™ is designed for use in the following application:

- An active or passive venting when used with CETCO vapor intrusion mitigation systems.

BENEFITS

- Installed directly on subgrade eliminating trenching and potential interference or damage to existing underground utilities
- Placed in closer proximity to the vapor intrusion barrier allowing for more effective venting of any accumulated gas
- Greater opening area per lineal foot of pipe and integral filter fabric allows for higher ventilation efficiency

TESTING DATA

PHYSICAL PROPERTIES		
CORE PROPERTY	**TEST METHOD**	**RESULT**
Compressive Strength	ASTM D 1621	8,500 - 11,000 psf (407 - 527 kN/m²)
Thickness	ASTM D 1777	1.0 in. (2.54 cm)
Flow Rate (Hydraulic gradient = .1)	ASTM D 4716	30 gpm/ft width (372 lpm/m)

FABRIC PROPERTY	**TEST METHOD**	**RESULT**
A.O.S.	ASTM D 4751	70 US Sieve (0.212 mm)
Grab Tensile Strength	ASTM D 4632	100 lbs. (0.45 kN)
CBR Puncture Strength	ASTM D 6241	250 lbs. (1.11 kN)
Flow Rate	ASTM D 4491	140 gpm/ft² (5,704 lpm/m²)

PACKAGING

GEOVENT™ is available in the following packaging option:

- 1 ft. x 165 ft. (0.3 m x 50 m) Rolls

North America: 847.851.1800 | 800.527.9948 | www.CETCO.com

UPDATED: FEBRUARY 2014

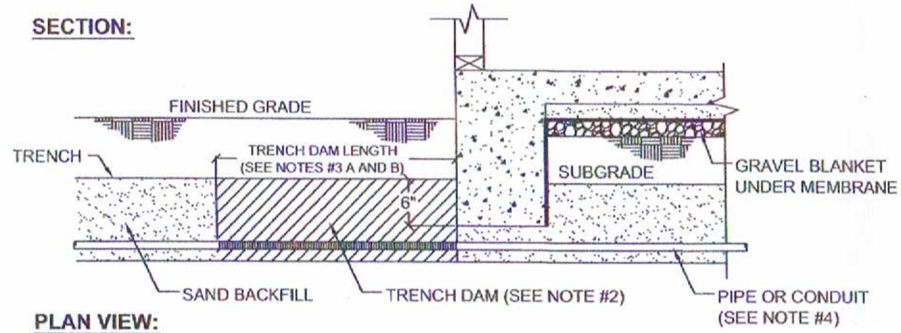
TDS_GEOVENT_AM_EN_201403_v1

CETCO®

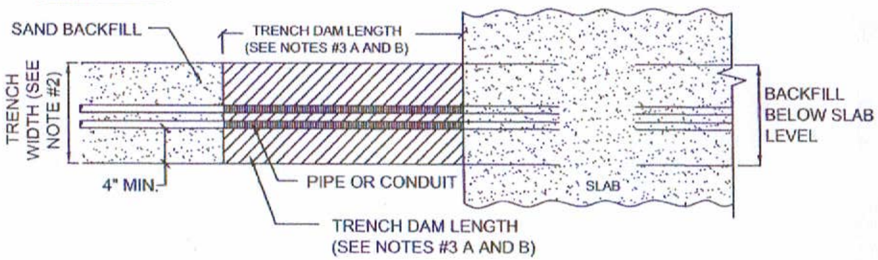
OUR STANDARDS. YOUR PEACE OF MIND.

A Minerals Technologies Company

SECTION:



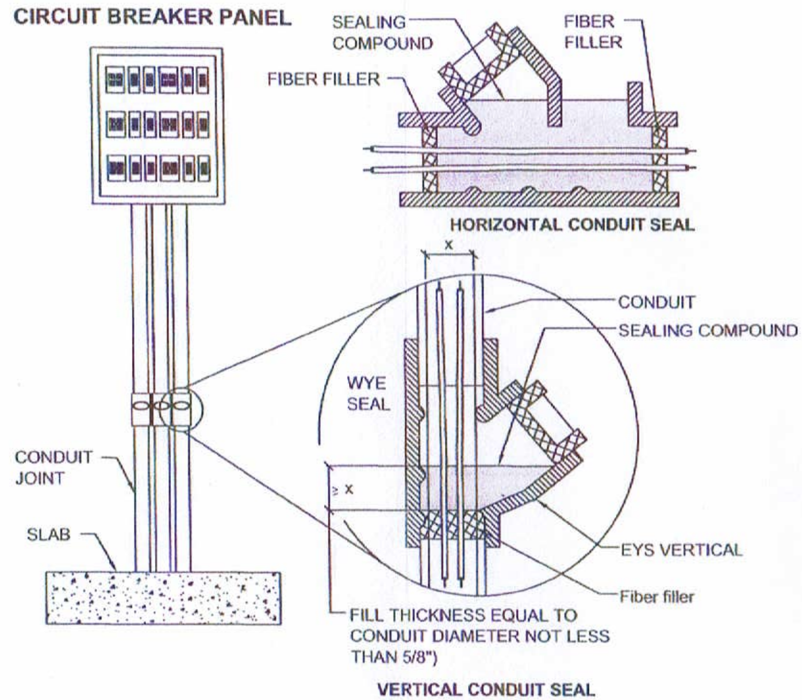
PLAN VIEW:



NOTES: TRENCH DAMS

1. ALL TRENCH DAMS SHALL BE INSTALLED IN TRENCHES CONTAINING PIPING AND CONDUIT THAT CONNECTS DIRECTLY FROM THE UTILITY LINES IN THE STREET.
2. THE WIDTH OF A TRENCH DAM SHALL BE ONE HALF THE LENGTH.
3. TRENCH DAMS SHALL BE CONSTRUCTED OF ONE OF THE FOLLOWING:
   A. BENTONITE CEMENT SLURRY THREE FEET LONG: A MIXTURE OF 4 % TYPE II CEMENT, AND 2% POWDERED BENTONITE.
   B. COMPACTED NATIVE SOILS BACKFILL FIVE FEET LONG: NATIVE SOILS SHALL BE COMPACTED AT LEAST 90 % RELATIVE COMPACTION IN ACCORDANCE WITH ASTM D-1557 TESTING PROCEDURES.
   C. CONCRETE MIXES OTHER THAN BENTONITE CEMENT SLURRY MAY BE USED PROVIDED CONDUIT OR PIPING IS WRAPPED WITH HIGH DENSITY PVC FOAM TAPE, CLOSED CELLS, ADHESIVE BACKED, 1/4" THICK BY ½" WIDE SHALL BE APPLIED TO CLEAR SURFACE WITH ENDS BUTTED TOGETHER AT MOST VISIBLE LOCATIONS IN TRENCH DAM.
4. PIPING AND CONDUIT SHALL BE PROTECTED FROM CORROSION AND STRUCTURAL SETTLEMENT AS FOLLOWS:
   A. TAPE SHALL BE APPLIED ON CONDUIT AND PIPING ENCASED IN CEMENT SLURRY OR CONCRETE.
   B. TAPE SHALL BE PS-37-90, BLACK PLASTIC PVC OR PE PRESSURE-SENSITIVE CORROSION PREVENTIVE TAPE.

DETAIL A: TRENCH DAM



DETAIL B: CONDUIT SEALS