N□we□, □e□□, En□. □ea□□

Su□e□: FW: Fuel Leak Case No. RO0000450, Former Uniton Oil Station No. 0843, 1629 Webster Street, Alameda
A□a□□men□s: SITE_MANAGE_R_2013-11-21.pdf; SITE_MANAGE_R_2014-04-07.pdf

From: Roe, Dilan, Env. Health
Sent: Friday, May 02, 2014 5:24 PM
To: 'Bishop, Timothy L'
Cc: 'Brandt, Katherine'; 'Fischer, Alexis N'; 'sam koka'
Subject: Fuel Leak Case No. RO0000450, Former Uniton Oil Station No. 0843, 1629 Webster Street, Alameda

Dear Mr. Bishop:

Alameda County Environmental Health (ACEH) staff have reviewed the Soil and Groundwater Management Plan (SGMP) dated March 2014 prepared by ARCADIS U.S, Inc. for the subject site on behalf of Chevron environmental Management Company. The SGMP outlines the process for requesting Chevron's assistance in identifying and managing soil and/or groundwater contamination associated with Union Oil's former operations during redevelopment activities at the site.

Our review of the document indicates insufficient details have been provided to describe soil and groundwater management protocols and risk management procedures to be followed during construction activities during redevelopment. Please revise the SGMP to include a description of the proposed development and measures that will be taken for excavation and off-site disposal of impacted soil (if encountered), groundwater handling and disposal, confirmation soil sampling and the importation of fill, as requested in our January 28, 2014 Directive Letter. I have attached examples of Site Management Plans containing the requisite level of detail for your reference.

Please note that approval of the SGMP is a prerequisite to ACEH's issuance of a "no further remedial action letter" to the property owners to facilitate initiation of site redevelopment activities.

Dilan Roe, P.E.
Program Manager - Land Use & Local Oversight Program
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502
510.567.6767; Ext. 36767
QIC: 30440
dilan.roe@acgov.org

PDF copies of case files can be reviewed/downloaded at:

http://www.acgov.org/aceh/lop/ust.htm

RECEIVED
By Alameda County Environmental Health at 3:21 pm, Dec 05, 2013

November 21, 2013

Ms. Karel Detterman
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Subject: **Perjury Statement and Report Transmittal**
1620-1640 Park Street (Parcel B)
Alameda, California 94501
AEI Project No. 298931
ACEH RO#0000008

Dear Ms. Detterman:

I declare under penalty of perjury, that the information and/or recommendations contained in the attached report for the above-referenced site are true and correct to the best of my knowledge.

If you have any questions or need additional information, please do not hesitate to call me or Mr. Peter McIntyre at AEI Consultants, (925) 746-6004.

Sincerely,

John Buestad
President

JB/pm

Attachment: AEI Consultants, *Site Management Plan – Commercial Development*

cc: Mr. Peter McIntyre, AEI Consultants, 2500 Camino Diablo, Walnut Creek, CA 94597

November 21, 2013

SITE MANAGEMENT PLAN - COMMERCIAL DEVELOPMENT

Property Identification:
1620-1640 Park Street – Parcel B
Alameda, California

AEI Project No. 298931
ACEHD Fuel Leak Case No. RO0000008

Prepared for:
Foley Street Investments
Attn: Mr. John Buestad
2533 Clement Avenue
Alameda, CA 94501

Prepared by:
AEI Consultants
2500 Camino Diablo
Walnut Creek, CA 94597
(925) 746-6000

San Francisco HQ
Atlanta
Chicago
Costa Mesa
Dallas
Denver
Los Angeles
Miami
New York
Phoenix
Portland
San Jose

TABLE OF CONTENTS

FIGURES

AEI Consultants
Environmental & Engineering Services
2500 Camino Diablo, Walnut Creek, CA 94597
Tel: 925.746.6000 Fax: 925.746.6099

November 21, 2013

Alameda County Environmental Health Department
Attn: Ms. Karel Detterman
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Subject: **Site Management Plan – Commercial Development**
1620-1640 Park Street – Parcel B
Alameda, California
AEI Project No. 298931
ACEHD Fuel Leak Case No. RO0000008

Dear Ms. Detterman:

1.0 INTRODUCTION

AEI Consultants (AEI) prepared this Site Management Plan (SMP) on behalf of Foley Street Investments, LLC (owner), for the commercial development at 1620-1640 Park Street, Alameda, California (Site); refer to Figures 1 and 2. Environmental activities at the site are currently being overseen by the Alameda County Environmental Health Department (ACEHD).

ACEHD will be notified within 24 hours if soil is encountered during construction that is suspected of being contaminated, or any other environmental conditions are encountered which may require action.

The purpose of this SMP is to provide a framework for appropriately addressing environmental impact's that may be encountered during development. The SMP includes the following components:

1. An overview description of the Site and planned development project;
2. Summary of known and potential environmental conditions;
3. Guidelines for managing soil, groundwater, and vapors that may be encountered; and
4. Mitigation measures for known or discovered environmental conditions.

The project involves the construction of one new commercial/retail building and associated parking and landscaping. Several phases of environmental assessment and remediation activities have been performed at the site and have identified the presence of hazardous materials released from historic site activities, primarily limited to petroleum hydrocarbons. An overview of the site history and cumulative results of these assessments is presented below; this information is summarized in more detail in AEI's *Interim Source Removal Report and Well Abandonment and Replacement Workplan Addendum dated December 7, 2012*.

2.0 SMP BACKGROUND

2.1 SITE DESCRIPTION AND PLANNED DEVELOPMENT

The Site is currently vacant will all previous buildings razed in 2012. The client proposes to redevelop the site for commercial use, consisting of one commercial/retail building. This will involve construction of one onsite building surrounded by parking and landscaping at grade. See Figure 2 for the locations of former features, current features, and proposed buildings.

2.2 SUMMARY OF ENVIRONMENTAL CONDITIONS

As discussed below, contaminants associated with prior on-site activities have been detected in soil and groundwater at the site. Investigation and cleanup activities have been performed under the oversight of the ACEHD. The activities completed to date have been relatively extensive and new contamination is not anticipated to be encountered during construction activities.

2.2.1 On-Site Environmental Conditions

USTs

The former building was constructed in 1945 for use as an automobile garage and showroom. In 1986, a 300-gallon waste oil underground storage tank (UST) and a 500-gallon UST were reportedly removed from the north end of the building property, and soil samples collected from the adjacent tank pits indicated release of hydrocarbon impacts to the subsurface. Multiple phases of investigation and remedial activities have taken place between 1987 and the present which have identified and removed a significant quantity of hydrocarbons from both soil and groundwater beneath the site. An estimated 18,134 pounds of hydrocarbons were removed from the soil during high vacuum, dual phase extraction activities in 2011 and 2012 and approximately 390,460 gallons of groundwater were extracted and treated. An additional 447 tons of soil was removed during excavation activities in October 2012 and 946.77 tons of soil was removed during excavation activities in October 2013.

Prior to interim remedial efforts, gasoline impacted soil was centered on the former UST and extended laterally in each direction, primarily to the north-northwest toward Park Street. The zone of impact was thickest at the UST pit and thinned with distance from the pit. To the east, south, and west, impacted soil appears to extend approximately 20 to 50 feet from the former UST hold and approximately 100 feet to the north. It appears that the gasoline constituents travelled vertically from its source (the UST) then spread laterally along the groundwater surface. The lateral extent of gasoline impacted soil is reasonably well defined in each direction. Based on observations and excavation confirmation samples collected during October 2012 and October 2013 excavations of the former UST-hold and surrounding area and the hydraulic lifts, it appears that the bulk of gasoline impacts to soil have been removed in the core of the plume near the former UST.

The dissolved phase plume is also centered on the former UST hold and spreads generally in a northwesterly direction. The extent of the impacts in groundwater have been defined to the south and southeast, as demonstrated by grab groundwater samples collected in January 2012, from borings AEI-24, AEI-25 and AEI-26 and to the east of the former tank pit as demonstrated

by grab groundwater samples collected from borings GP3 (April 2008) and AEI-27 in (January 2012). Groundwater impacts are also well defined to the northwest as demonstrated by analysis of groundwater samples collected from monitoring wells MW-4 and MW-5 and historical locations GP-18, GP-19, and GP-20 and to the west by groundwater samples collected from DPE-4. Current groundwater conditions as reported during the most recent sampling events (May and August 2013) are included on Figure 3. VOC data from the groundwater sampling event completed in August 2013 is included on Figure 4.

Hydraulic Lifts

A total of six hydraulic lifts have been present at the subject site. The five lifts in the northern portion of the former building were removed in the 1980s and the lift in the center portion of the former building was removed in 2012. No contamination associated with the lift removed during 2012 has been identified, however, oil-, gasoline- and VOC-impacted soil was identified adjacent to several former lifts in the northern portion of the former building. During October 2012, impacted soil within the vicinity of the former hydraulic lifts was excavated. Based on observations and confirmation samples collected, the majority of impacts to soil have been removed in the vicinity of the northeast corner of the former building. (Figure 5). The majority of impacted soil was previously removed in 2012 in all locations except near DPE-5 where the 2012 excavation was limited to avoid damage to this well. Additional excavation activities in October 2013 were able to remove the majority of impacted soil in all directions; however, confirmation samples indicated that lower concentrations of residual hydrocarbons and VOCs remain in the soil to the north and east of the excavation (Figure 6). The vertical extent of impacted soil has been well defined by past investigations. Vertically, the top of the impacted zone begins at approximately 7 to 8 feet bgs and ends between approximately 12 to 14 feet bgs.

2.3 CONTAMINANTS OF POTENTIAL CONCERN

The primary contaminants of potential concern (CPOCs) are gasoline and gasoline constituents [TPH-g, benzene, toluene, ethylbenzene, and xylenes (BTEX)] and PCE from the gasoline and waste oil UST system release. MTBE has not been detected during recent sample analyses nor have significant concentrations of fuel oxygenates been detected.

Heavier hydrocarbons (reported as TPH-d and TPH-mo), combined with the gasoline and VOCs, have been detected in the area of the hydraulic lifts. No PCBs were detected in samples from near the lifts and no VOCs were detected in samples near the former paint booth or drain features within the repair shop.

2.4 SITE HYDROGEOLOGY

During the drilling conducted by AEI in 2011 to 2012, groundwater was first observed in the temporary direct push borings at depths of approximately 9 to 11 feet bgs and stabilized at between approximately 7.5 to 8.5 feet bgs. The depth to water in the groundwater monitoring wells has generally ranged from approximately 7.5 to 9.5 feet bgs. The groundwater flow direction has typically been reported towards the northwest.

3.0 SOIL AND GROUNDWATER MANAGEMENT

3.1 SMP APPLICABILITY

As noted above, soil and groundwater impacted with concentrations of COPCs may be present at various on-site locations. This SMP presents protocol for the following construction activities that may encounter COPCs:

- Surfacing, excavation, and grading;
- Subsurface utility installation, maintenance, or repair;
- Landscaping; and
- Building foundation construction and other subsurface work.

Although impacted soil and groundwater is not likely to be encountered in areas outside of what was described above, contractors and their Subcontractors shall follow the soil and groundwater management protocols presented in this SMP anywhere on-Site. In addition, if Contractors or their Subcontractors observe conditions indicative of contamination anywhere on-Site, they will follow the protocols presented in this document.

3.2 RISK MANAGEMENT

This section presents the risk management procedures to be followed during the above described construction activities during the on-site development, including worker training and impact mitigation measures.

3.2.1 Pre-Construction Planning and Notification

Prior to the start of any construction activity that involves below ground work (e.g. mass grading, foundation construction, excavating or utility trenching), information regarding Site risk management procedures (a copy of this SMP) will be provided to the Contractors for their review and each Contractor shall provide such information to its Subcontractors.

3.2.2 Site-Specific Health and Safety Worker Requirements

Each Contractor shall be responsible for the health and safety of their own workers, as required by Cal-OSHA, including but not limited to preparation of their own health and safety plan (HSP) and injury and illness prevention plan (IIPP). The purpose of these documents is to provide general guidance to the work hazards that may be encountered during each phase of Site construction activities. Contractors are also required to determine the requirements for worker training, based on the level of expected contact to soil, soil vapor, and groundwater associated with the contractor's activities and locations with respect to COPCs described in Section 2.3. The HSP will contain provisions for limiting and monitoring chemical exposure to construction workers, chemical and non-chemical hazards, emergency procedures, and standard safety protocols.

3.2.3 Construction Impact Mitigation Measures

During construction, measures will be taken by Contractors to minimize dust generation, and appropriately manage storm water runoff, and tracking of soil off-site. In addition, measures will be taken to reduce the potential for the creation of preferential pathways (vertical or horizontal) for COPCs present in groundwater beneath the Site. The construction impact mitigation measures are described below.

3.2.3.1 Site Control

Site control procedures will be implemented by the Contractor to control the flow of personnel, vehicles, and materials in and out of the site while working with potentially contaminated materials. In addition, Site control measures will help control the spread of COPCs from the Site, if they are present. The Site perimeter will be fenced by the Contractor. Access and egress will be controlled at selected locations. Signs will be posted by the Contractor at all Site entrances instructing visitors to sign in at the project support areas.

3.2.3.2 Equipment Decontamination

Because of the impacted soil and groundwater present at the site, precautions to limit the off-Site transfer of soil are warranted. These precautions also are applicable if during any construction, impacted soil is expected or confirmed to be encountered. Decontamination procedures will be established and implemented by the Contractor to reduce the potential for construction equipment and vehicles to release contaminated soil onto public roadways or other inadvertent off-Site transfer. At a minimum, gravel will be placed by the Contractor at all Site access points and excess soil will be removed from construction equipment using dry methods (e.g., brushing or scraping) prior to moving the equipment to off-Site locations.

3.2.3.3 Personal Protective Equipment

Personal Protective Equipment (PPE), including appropriate clothing are used to isolate workers from COPCs and physical hazards. The minimum level of protection for workers coming into direct contact with potentially contaminated materials is Level D, listed below. The level of PPE will be evaluated by the contractor and modified if warranted based upon conditions encountered at the Site and/or type of work activity in accordance with their own HSP (see Section 3.2.2).

- Coveralls or similar construction work clothing;
- Reflective safety vests;
- Steel-toed boots;
- Hard hat;
- Work gloves, as necessary;
- Safety glasses, as necessary; and
- Hearing protection, as necessary

3.2.3.4 Dust Control

Mitigation measures will be conducted during soil handing and earthwork to minimize the creation and dispersion of dust, including the following measures:

- Application of water while grading, excavating, and loading, as needed;
- Limiting vehicle speeds to 5-miles per hour on unpaved portions of the Property;
- Minimizing drop heights while loading/unloading soil; and,
- Additional measures as may be identified and implemented by Contractors, as necessary, especially if dry and windy conditions persist during periods of earthwork.

During grading activities and depending upon Site conditions, the Environmental Consultant may set up dust monitors to document airborne concentrations at upwind and downwind Property boundaries. If implemented, the monitoring will be performed using DataRAM PDR-1000 particulate monitors or their equivalent. The locations of the monitoring stations will be determined by the environmental geologist or engineer in the field. The wind direction and time of observation will be recorded in the field and the sampling location will be modified during the day if significant changes in wind direction are readily observed. The particulate meters will be monitored by the field geologist or engineer to evaluate if excessive dust is migrating off-site. Each time the monitors are checked, the differences between the average upwind dust concentration and the average downwind concentration will be compared to ambient air quality standard of 150 micrograms per cubic meter over an averaging time of 8-hours for respirable dust. If this standard is exceeded, increased dust control measures will be implemented. Results of the air monitoring, if performed, will be summarized for the Owner and Contractor in daily reports.

3.2.3.5 Storm Water Pollution Controls

The Civil Engineer will prepare a storm water pollution prevention plan (SWPPP) for the Site. Contractors and their Subcontractors shall comply with the provisions and protocols of the SWPPP. Storm water pollution controls will be based on best management practices (BMPs), such as those described in "Information on Erosion and Sediment Control for Construction Projects: A Guidebook" (Water Board 1998) and "Erosion and Sediment Control Field Manual, Third Edition (Water Board 1999). The California Stormwater Best Management Practice Handbooks published by the California Stormwater Quality Association (CASQA) (http://www.casqa.org) also reflect current practices and storm water management standards. Sediment and erosion control procedures may include, but are not limited to the following:

- Constructing temporary berms or erecting silt fences around exposed soil;
- Placing straw bale barriers or sediment traps around catch basins or other entrances to storm drains;
- Covering soil stockpiles with plastic sheeting or tarps during rainfall events; and
- Implementing other appropriate BMPs.

3.2.3.6 Corrosion

Current plans do not include the installation of any utilities through areas containing significantly elevated concentrations of hydrocarbons. However, because of the potentially corrosive nature of hydrocarbons and their potential detrimental impacts on utility pipelines, if plans are altered to include a utility installation within areas of potential significant impact, a corrosion study will be performed. The study will be performed by a licensed professional engineer, if warranted, based on the types, locations and depths of planned utilities. The study will evaluate the need for protective measures for utilities, which could include wrapping piping with corrosion resistant tape, applying an epoxy coating, using corrosion resistant piping materials (including gaskets, flanges and couplings) and/or installing a cathodic protection system.

3.3 GROUNDWATER MANAGEMENT PROTOCOLS

Groundwater may be encountered at depths ranging from approximately 7 to 11 feet bgs. Although mass excavation below the water table is not required for construction of the planned buildings, utility trenches could potentially be constructed at or below the water table. Measures will be taken to limit the potential for preferential vertical or horizontal migration due to construction and to ensure proper handling of any groundwater that is encountered.

3.3.1 Vertical and Horizontal Preferential Pathways

3.3.1.1 Utility Trenches

Although not anticipated, if utility trenches extend to the top of groundwater (anticipated at depths of approximately 7 feet or more), measures will be implemented to reduce the potential for vapor and groundwater migration through trench backfill and utility conduits. This work will be coordinated with the Environmental Consultant, Geotechnical Engineer, and Project Engineer, as appropriate. Such measures may include placement of low-permeability backfill "plugs" at selected intervals on-Site and at locations where the utility trenches extend off-Site. In addition, utility conduits that are placed below groundwater will be installed with water-tight fittings to reduce the potential for groundwater to migrate into the conduits. The Environmental Consultant may observe the installation of the selected "plugs" and record all placement locations.

3.3.2 Excavation De-Watering

Groundwater is not anticipated to be encountered during construction activities. However, if excavation de-watering is required, the water will be sampled and analyzed prior to water removal to evaluate discharge alternatives. Pursuant to Water Board resolution 88-160, the preferred use of the extracted water is recycling (reclamation) or on-Site re-use. If such water is to be used for on-Site dust control, concentrations of COPC shall be compared to the lower of the Water Board's Environmental Screening Levels (ESLs) for fresh or estuarine surface water. If recycling or re-use is not appropriate, based on analytical data or Site circumstances (i.e. elevated COPC concentrations, more water than is necessary for dust control, etc), the next preferred alternative is discharge to publicly owned treatment works (sanitary sewer). If recycling/on-Site reuse or discharge to publicly owned treatment works is not appropriate, then treatment and discharge to the local storm drain shall be evaluated. Discharge of such water will be performed in accordance with the National Pollutant Discharge Elimination System (NPDES) general permit for construction and any other applicable permits. If only a small quantity of water is required to be removed, then offsite hauling for proper disposal will be evaluated. The Regional Water Quality Control Board (RWQCB) and/or ACEHD will be notified of the results of any groundwater sampling and will be consulted on the planned disposition of groundwater that may be generated at the site.

3.3.3 Groundwater Monitoring Wells

Groundwater monitoring wells are present on the Site to monitor impacted groundwater from the ongoing investigation at the site. The approximate well locations of the twelve wells are shown on Figure 2. These wells will be properly decommissioned by under permit from the

ACEHD. If on-Site demolition begins prior to well decommissioning, the Contractor is responsible for ensuring such wells are not damaged prior to proper decommissioning.

3.3.4 Soil Vapor Monitoring Points

Soil vapor monitoring points are present on the Site to monitor soil vapor concentrations at the Site. The approximate locations of the points are shown on Figure 2. These points will be properly decommissioned by under permit from the ACEHD. If on-Site soil work begins prior to decommissioning, the Contractor is responsible for ensuring such vapor points are not damaged prior to proper decommissioning.

3.4 SOIL MANAGEMENT PROTOCOLS

3.4.1 Soil Monitoring and Screening

If soil is encountered that is suspected of being contaminated (e.g., if soil discoloration or odors are noted), during construction, the potentially impacted soil will be field screened by the Environmental Consultant. It is expected that the Environmental Consultant will only be used on an as needed basis (whenever potentially contaminated soil is encountered) and will not be onsite during the entire duration of construction activities. The Environmental Consultant and ACEHD will be notified immediately by the Contractor in the event that potentially impacted soil is encountered, and the Environmental Consultant will be onsite to perform field screening and possible sample collection as discussed below.

The Environmental Consultant will perform the field screening. In general, the field screening protocol will consist of using a hand-held photo-ionization detector (PID) instrument. Field screening of soil will be performed using the headspace analysis method of placing a small volume of soil into a plastic baggie, sealing the baggie, and placing the PID probe tip into the baggie after a minimum waiting period of 30 seconds. Field screening PID readings will be written in a bound project-dedicated log book along with notable field observations, if any. The PID instrument will be an Ion Science Phocheck+PID, a MiniRae 3000 PID or functionally similar instrument. The instrument will be capable of quantifying total VOCs in air and include features to minimize interference from high relative humidity which may be encountered during the headspace analysis. Each instrument will have a standard 10.6eV lamp, capable of ionizing VOCs. Each instrument will be field calibrated using isobutylene.

A field screening value of 10 ppmv above background using the headspace analysis method will be used as an action level to trigger follow-up soil sampling for laboratory analysis. Each day field screening is performed, a series of three background readings will initially be generated using on-site soil from locations away from potential source areas. Those values will be averaged to form a background value for that day. Headspace field readings consistently above 10 ppmv plus background would trigger collection of at least one soil sample for laboratory analysis of TPH using EPA Method 8015 and VOCs using EPA Method 8260B. Soil samples submitted for laboratory analysis may be analyzed on a rush basis, as appropriate based on the data turn-around requirements of the day's activities. Laboratory results will be documented and submitted to the Owner.

The field screening trigger level of 10 ppmv plus background will also be used to determine whether 40-hour HAZWOPER trained construction workers and equipment operators are needed

in areas showing potential soil impact, until conditions are verified with laboratory data. If field instrument readings of 10 ppmv plus background are consistently recorded in an area, then the Contractor will be notified by the Environmental Consultant and the Contractor, in consultation with the Environmental Consultant, will determine whether 40-hour trained HAZWOPER personnel will be used for working in that area. In such a case, only work being performed in that particular area will be suspended and the area will be cordoned off until 40-hour trained personnel are available.

It is noted that soil moisture and other factors can influence field instrument readings resulting in false positive results. If readings are unusually high in the absence of other indications of soil impact, suggesting excess moisture or other factors, a replacement instrument will be obtained and locations with high readings will be confirmed. Also, if only one or two field screening readings slightly exceed 10 ppmv plus background and other readings collected in the same general area do not, then a soil sample may not be collected for laboratory analysis at the discretion of the Environmental Consultant. In the event field monitoring PID readings trigger soil sampling, the Contractor will be notified to temporarily stop work at the location and the Consultant will perform a limited assessment in the area of potential soil impact. One or more soil samples may be collected for laboratory analysis in the area showing elevated PID readings.

Upon receipt of analytical results, the Owner may direct the Environmental Consultant to investigate the extent of the potential hydrocarbon impacted area. Such investigation may include the use of a backhoe, hand auger equipment, or drill rig, as circumstances may dictate for additional soil screening or the collection of soil, soil gas, and/or groundwater samples. Other COPCs may be investigated, as may be appropriate. Such investigation and any subsequent characterization or remediation work, will be coordinated between the Owner, the Environmental Consultant, and Contractor.

3.4.2 Management of Impacted Soil

During construction activities, if soil is encountered that is suspected of being contaminated (e.g., if soil discoloration or odors are noted), or if buried structures (such as sumps, tanks, drain systems), debris or un-abandoned wells are encountered, earthwork in the suspect area will be immediately stopped and worker access to the suspect area will be restricted. The area will be cordoned off using delineators and caution tape, or similar materials by the Contractor and the Environmental Consultant and ACEHD will be notified. The quality of soil suspected to be contaminated will be evaluated through field screening and/or analytical testing by the Environmental Consultant so that appropriate handling and disposal alternatives can be determined. If on-site re-use of the contaminated soil is desired, soil samples shall be collected from the stockpile and analyzed for COPCs (Section 2.3).

If COPCs are detected, whether above or below regulatory agency screening levels, further investigation of the area may be performed as determined by the Owner in coordination with the Environmental Consultant. For soil considered for re-use, if COPCs are detected below applicable screening levels, re-use of the soil may be appropriate, at the discretion of the Environmental Consultant and Owner.

If COPCs are detected above the applicable ESLs, the results will be communicated to the ACEHD and soils will be profiled into a landfill facility for proper disposal under appropriate

waste manifest. Prior to off-Site disposal, soil samples will be collected and analyzed in accordance with the requirements of the selected disposal facility.

Cleanup/remediation activities may be required at the Site if impacted soils are encountered or a previously unknown release is identified in order to meet applicable federal, state and local laws, regulations and requirements. If impacted soil is identified at the Site, earthwork activities in contaminated areas will be performed by licensed hazardous materials contractors and personnel trained in hazardous waste operations (40-hour OSHA training), if warranted based on COPC concentrations. The soil management procedures described in this document and the contractor's HSP will be followed. The scope of such removal action will be determined by the Owner in coordination with the Environmental Consultant.

Soil suspected of being contaminated that is excavated during construction shall be stockpiled separately from "clean" soil. Stockpiled soil that is suspected to be contaminated shall be stockpiled on-Site on top of and covered by an "impermeable" liner (i.e., 6 mil plastic sheeting) by the Contractor to reduce infiltration by rainwater and contamination of underlying soil. The soil shall be managed for erosion and sediment control by surrounding the base with straw wattles or other methods consistent with SWPPP BMPs. Stockpiles shall be checked daily by the Contractor to verify that they are adequately covered.

3.4.3 Management of Soil During Construction

Surplus soil generated during development may be transported from the Site. If no impact is identified during the monitoring procedures outlined in Section 3.4.1, such surplus soil will either be transported to an appropriate landfill facility or to another project that accepts the soil. If transported to another project, soil samples will be collected and analyzed in accordance with the requirements of that project in consultation with the Environmental Consultant. If transported to a landfill facility, the soil samples will be collected and analyzed according the profiling requirements of that facility. The Contractor will coordinate with the Environmental Consultant regarding off-Site soil disposal activities. As outlined in Section 3.4.2, the ACEHD shall be contacted if potentially impacted soil is discovered. As stated in Section 3.4.2, surplus soils with detectable concentrations of hydrocarbons above the applicable screening level will not be re-used onsite; such soils would be properly disposed of at an offsite landfill. Disposal documentation will be provided to the ACEHD.

3.4.4 Import Fill

The Environmental Consultant, Geotechnical Engineer, and ACEHD will be notified prior to importing fill soil to the Site. An evaluation of import fill materials will be conducted to ensure such fill meets the geotechnical and environmental requirements. To minimize the potential introduction of contaminated fill onto the Site, all selected sources of import fill will have adequate documentation to verify that the fill source is appropriate for the Site. Documentation will include detailed information on previous land use of the fill source, any Phase I Environmental Site Assessments performed and the findings, and the results of any analytical testing performed (Phase II Investigations).

If no documentation is available or the documentation is inadequate or if no analytical testing has been performed, samples of the potential fill material will be collected and analyzed prior to delivery of such soil to the site. The analyses selected will be based on the fill source and knowledge of the previous land use as determined by the Environmental Consultant. The sample frequency for potential fill material will be in accordance with that outlined in the technical document titled, "Information Advisory on Clean Imported Fill Material" (DTSC, October 2001). The Environmental Consultant will provide guidance to the Contractor regarding acceptability of imported fill; no fill material will be accepted if contaminant levels exceed current residential environmental screening goals (unrestricted re-use criteria) and/or regional background concentrations.

4.0 NOTIFICATION AND DOCUMENTATION

4.1 KEY CONTACTS

Exhibit 2: Key Contacts

Company	Role	Contact	Telephone Number
Foley Street Investments, LLC	Owner	John Buestad Ken Carvalho	510-523-1925 (o) 510-523-1925 (o)
AEI Consultants	Environmental Consultant	Peter McIntyre, PG (Project Director)	925-746-6000 (o) 925-285-8286 (c)
		Jeremy Smith (Sr. Project Manager)	925-746-6028 (o) 925-917-0156 (c)
ACEHD	Case Manager	Karel Detterman	510-567-6708 (o)
To Be Determined	General Contractor		
To Be Determined	Project Engineer		
To Be Determined	Geotechnical Engineer		
To Be Determined	Civil Engineer (SWPPP)		

(o) office phone number; (c) cell phone number

4.2 NOTIFICATIONS

Notifications of the discovery of COPCs in field screening, observations, or analytical results or other conditions of potential environmental concern are to be made immediately to the Owner, the Environmental Consultant (attention Peter McIntyre), and ACEHD. The Owner will determine the need for other required notifications. If such discovery or conditions require notification to the Contractor and/or Sub-Contractors, such notification will be determined by the Owner and the Environmental Consultant.

4.3 DOCUMENTATION

The Environmental Consultant may prepare a report(s), at the discretion of the Owner. The Environmental Consultant may provide documentation of conditions, including observations, screening results, and laboratory results as needed to inform the Contractor of conditions in various work areas and as may be needed to comply with provisions of this SMP, including HSP requirements, work practices, material handing requirements, or other recommendations.

5.0 LIMITATIONS

Contractors and Subcontractors are responsible for review of this SMP prior commencing work at the Site and for the health and safety of their own employees and subcontractors. The Owner is responsible for review of the provisions of this SMP and for incorporating its guidelines into their project planning and specifications. This document was prepared for the sole use and benefit of Foley Street Investments, LLC., its project subsidiary, and its Contractors and Consultants at the Site. Neither this report, nor any of the information contained herein shall be used or relied upon for any purpose by any person or entities. AEI relied on information prepared by others however AEI cannot be responsible for its accuracy or completeness or for the availability of all information that may be relevant to the preparation of this document.

If there are any questions, please do not hesitate to contact AEI at 925-746-6000.

Sincerely,
AEI Consultants

REGISTERED GEOLOGIST
PETER J. MCINTYRE
Exp. 6/30/14
No. 7702
STATE OF CALIFORNIA

Peter McIntyre, PG
Executive Vice President

Jeremy Smith
Sr. Project Manager

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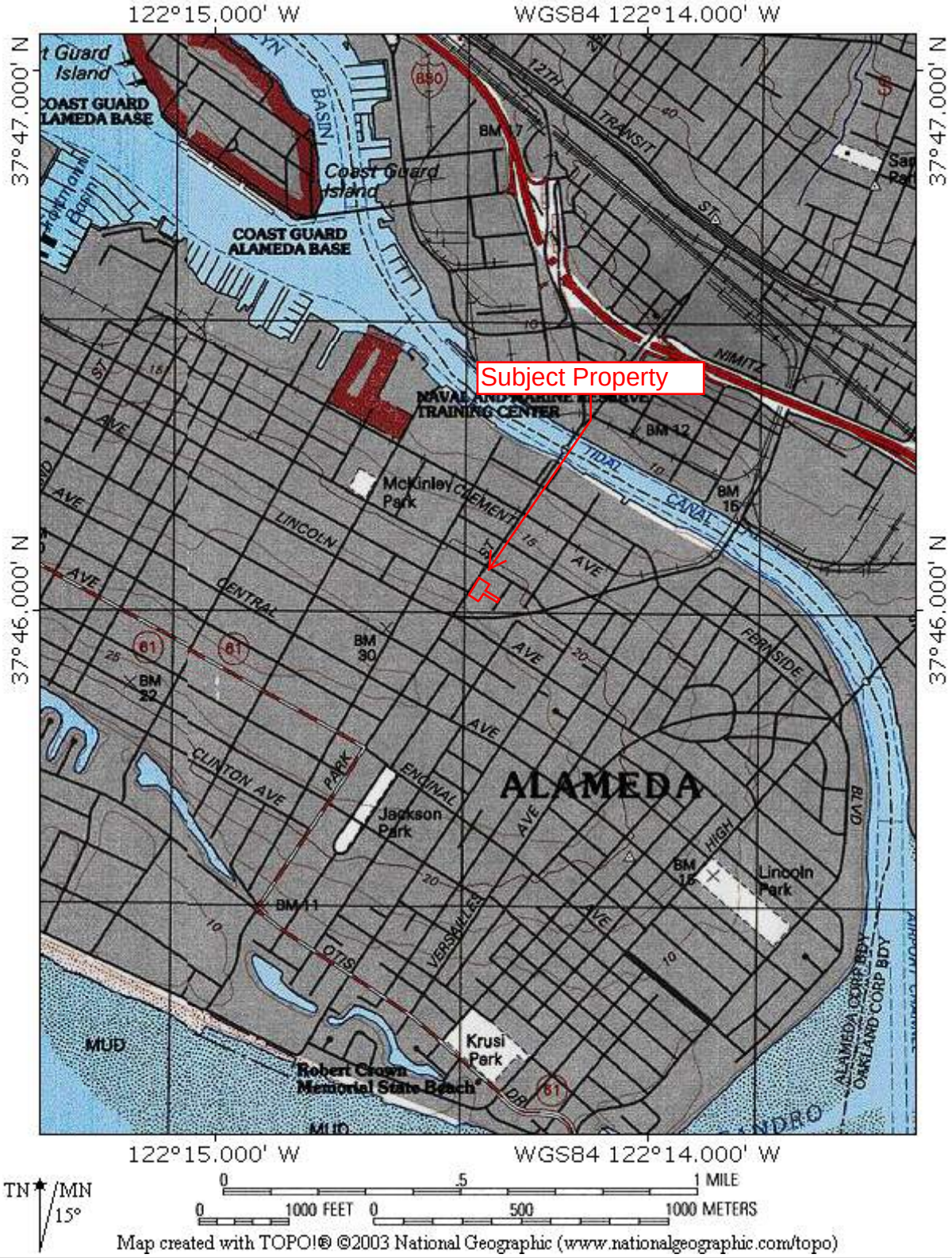
John Buestad, Foley Street Investments
Karel Detterman, Alameda County Environmental Health Department (FTP Upload)
GeoTracker (Upload)



SITE LOCATION MAP

1600-1650 Park Street Alameda, California 94501

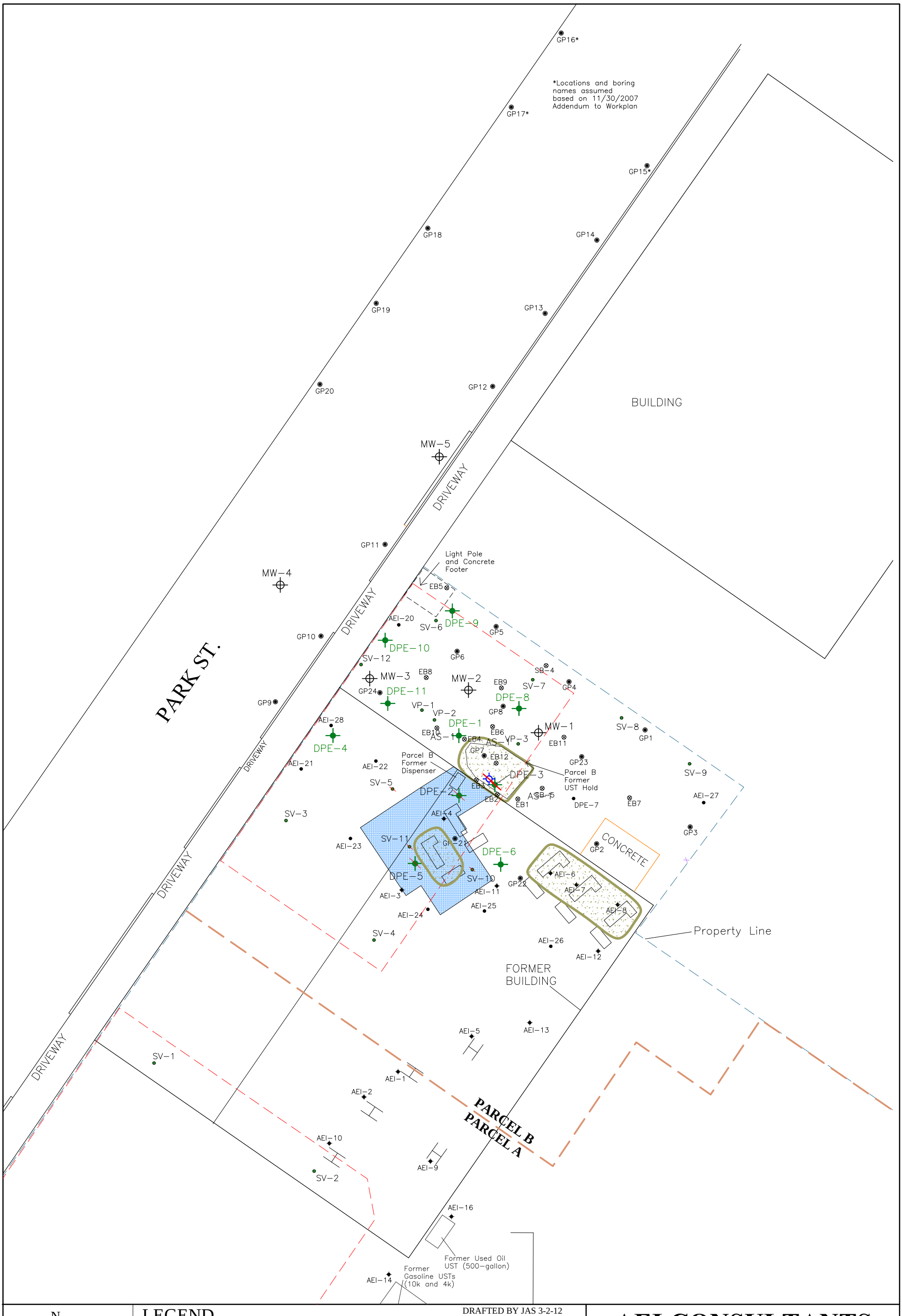
N

FIGURE 1

Source: USGS

Project Number: 298931

AEI Consultants



N

W E

S

0 15 30

Scale: 1" = 30'

LEGEND

- Existing / Destroyed Remediation Well
- AEI Soil Boring (1/12)
- Existing / Destroyed Vapor Probe
- AEI Soil Boring (7/11)
- Soil Boring (2008)
- Soil Boring (Pre-1997)
- Groundwater Monitoring Well
- Parcel Split
- Proposed Building Extents
- Former Hydraulic Lift
- Former Hydraulic Lift w/ Excavation
- Abandoned Well
- Property Line
- 2013 Excavation

DRAFTED BY JAS 3-2-12
REVISED BY JAS 10-16-13

AEI CONSULTANTS

2500 CAMINO DIABLO, WALNUT CREEK

SITE PLAN - PARCEL B

1620-1640 PARK STREET
ALAMEDA, CALIFORNIA

FIGURE 2
PROJECT NO. 298931

N
W E
S

BUILDING

PARK ST.

DRIVEWAY

FENCE

MW–5

TPHg - 64
TPHd - <50
TPHmo - <250
B - <0.5
T - <0.5
E - <0.5
X - <0.5

TPHg - <50
TPHd - <50
TPHmo - <250
B - <0.5
T - <0.5
E - <0.5
X - <0.5

MW–4

TPHg - 3,700
TPHd - 2,600
TPHmo - <250
B - 8.2
T - <0.5
E - <0.5
X - <0.5

TPHg - 1,700
TPHd - 1,300
TPHmo - <250
B - 3.9
T - <0.5
E - <0.5
X - <0.5

TPHg - 280
TPHd - 190
TPHmo - <250
B - 2.2
T - <0.5
E - 5.6
X - 5.6

DPE–9

DPE–10

TPHg - <50
TPHd - <50
TPHmo - <250
B - <0.5
T - <0.5
E - <0.5
X - <0.5

MW–3

MW–2

TPHg - 140
TPHd - 92
TPHmo - <250
B - 8.0
T - <0.5
E - <0.5
X - <0.5

DPE–11

DPE–8

DPE–1

MW–1

TPHg - 210
TPHd - 53
TPHmo - <250
B - 12
T - <0.5
E - <0.5
X - <0.5

DPE–4

TPHg - <50
TPHd - <50
TPHmo - <250
B - 3.1
T - <0.5
E - <0.5
X - <0.5

AS–1

DPE–3

Former
UST Hold

DPE–2

TPHg - <50
TPHd - <50
TPHmo - <250
B - <0.5
T - <0.5
E - <0.5
X - <0.5

DPE–5

DPE–6

TPHg - 330
TPHd - 74
TPHmo - <250
B - 18
T - <5.0
E - 35
X - 39

LNAPL
(0.17')

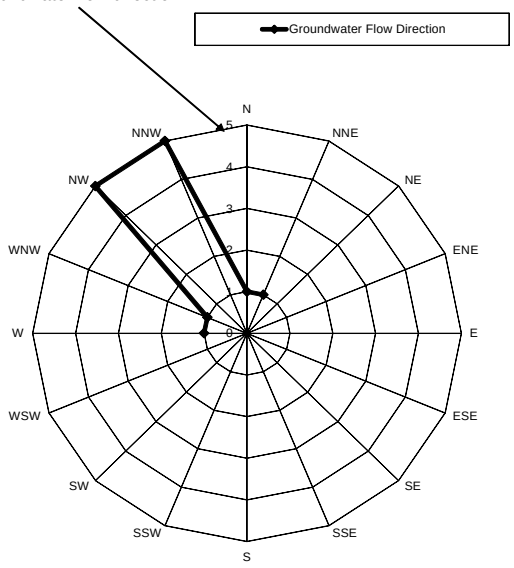
TPHg - 180
TPHd - 57
TPHmo - <250
B - 360
T - <5.0
E - 30
X - 11

TPHg - <50
TPHd - 1,200
TPHmo - 1,100
B - 0.53
T - <0.5
E - <0.5
X - <0.5

BUILDING

Groundwater Flow Direction
Former Good Cleaners,
1630 Park Street, Alameda, CA

Number of events per
groundwater flow direction.



0 10 20

Scale: 1" = 20'

TPHg = Total Petroleum Hydrocarbons as Gasoline
TPHd = Total Petroleum Hydrocarbons as Diesel
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes
NA = Not available
All results in micrograms per liter (ug/L)

LEGEND

Remediation (DPE) Well

Abandoned Well

Groundwater Monitoring Well

DRAFTED BY JAS 3-9-12
REVISED BY JAS 05-22-13

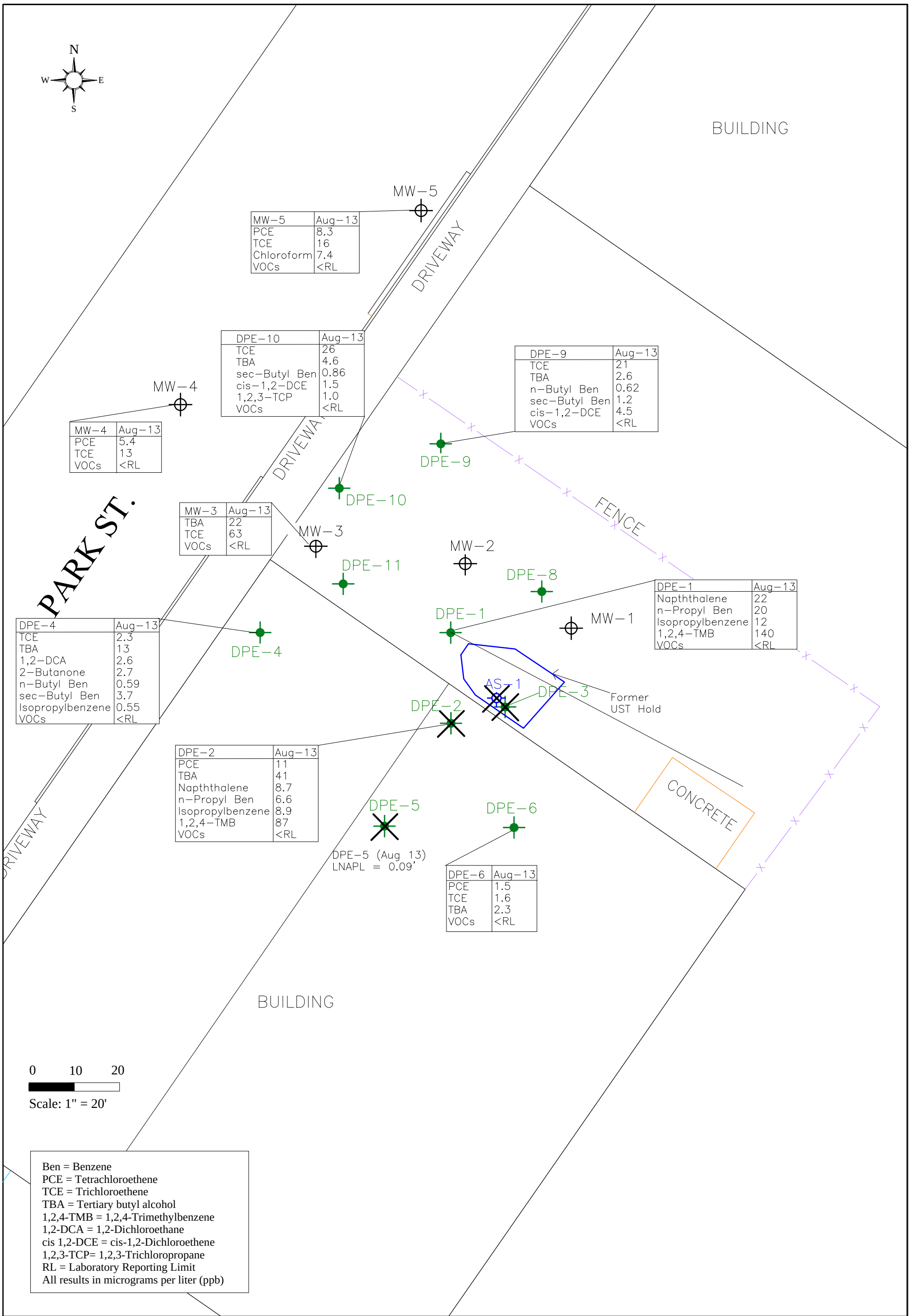
AEI CONSULTANTS

2500 CAMINO DIABLO, WALNUT CREEK

GROUNDWATER ANALYTICAL DATA - MAY / AUGUST 2013

1620-1640 PARK STREET
ALAMEDA, CALIFORNIA

FIGURE 3
PROJECT NO. 298931



LEGEND

- Remediation (DPE) Well
- Abandoned Well
- Groundwater Monitoring Well

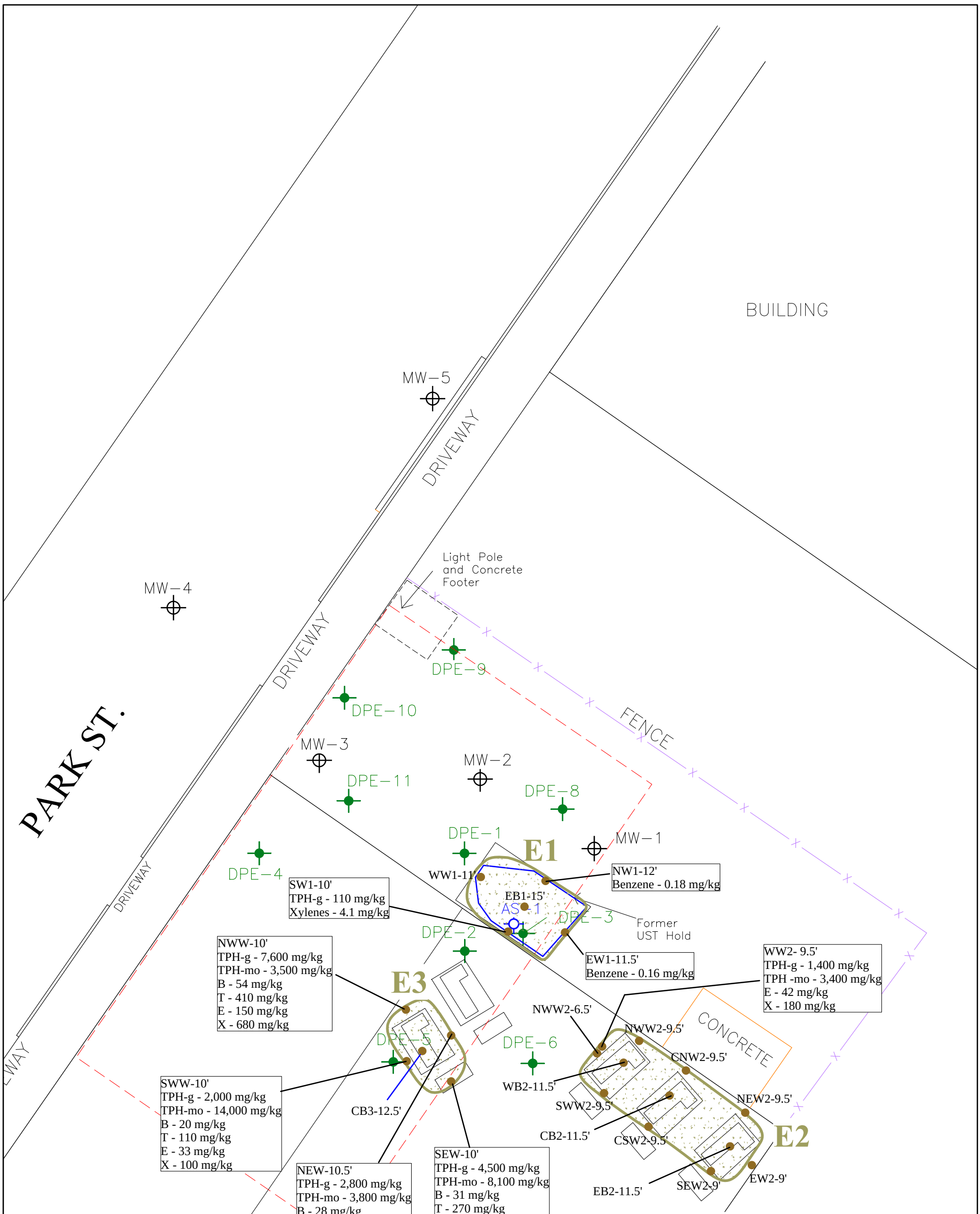
DRAFTED BY JAS 3-9-12
REVISED BY JAS 08-9-13

AEI CONSULTANTS
2500 CAMINO DIABLO, WALNUT CREEK

GROUNDWATER ANALYTICAL DATA (VOCs) - AUGUST 2013

1630 PARK STREET
ALAMEDA, CALIFORNIA

FIGURE 4
PROJECT NO. 298931



DRAFTED BY JAS 3-2-12
REVISED BY STL 11-12-12

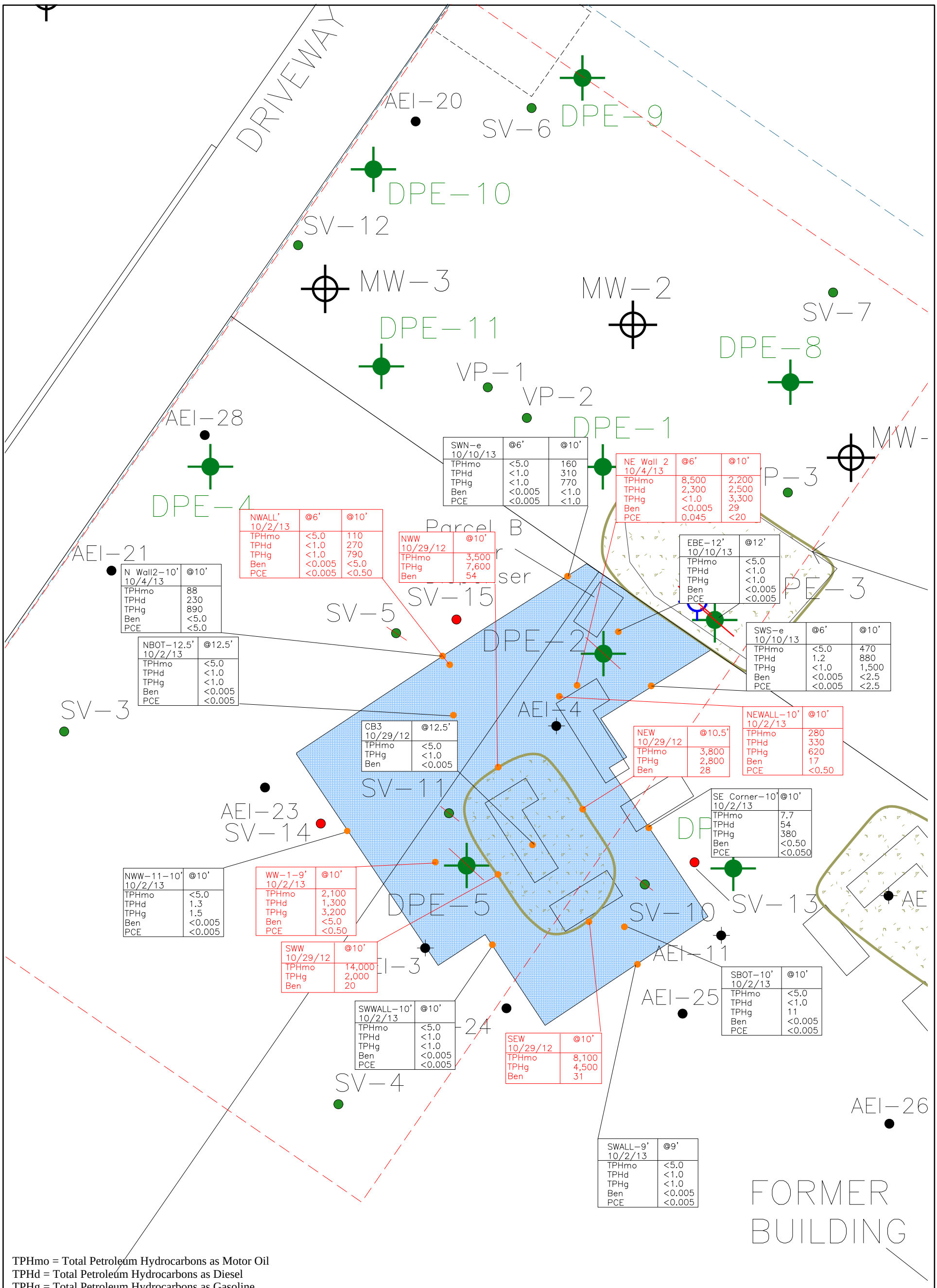
AEI CONSULTANTS

2500 CAMINO DIABLO, WALNUT CREEK

Excavation Analytical Data
October 2012

1620-1640 PARK STREET
ALAMEDA, CALIFORNIA

FIGURE 5
PROJECT NO. 298931



SWN–e 10/10/13	@6'	@10'
TPHmo	<5.0	160
TPHd	<1.0	310
TPHg	<1.0	770
Ben	<0.005	<1.0
PCE	<0.005	<1.0

NE Wall 2 10/4/13	@6'	@10'
TPHmo	8,500	2,200
TPHd	2,300	2,500
TPHg	<1.0	3,300
Ben	<0.005	29
PCE	0.045	<20

NWALL' 10/2/13	@6'	@10'
TPHmo	<5.0	110
TPHd	<1.0	270
TPHg	<1.0	790
Ben	<0.005	<5.0
PCE	<0.005	<0.50

NWW 10/29/12	@10'
TPHmo	3,500
TPHg	7,600
Ben	54

EBE–12' 10/10/13	@12'
TPHmo	<5.0
TPHd	<1.0
TPHg	<1.0
Ben	<0.005
PCE	<0.005

N Wall2–10' 10/4/13	@10'
TPHmo	88
TPHd	230
TPHg	890
Ben	<5.0
PCE	<5.0

SWS–e 10/10/13	@6'	@10'
TPHmo	<5.0	470
TPHd	1.2	880
TPHg	<1.0	1,500
Ben	<0.005	<2.5
PCE	<0.005	<2.5

NBOT–12.5' 10/2/13	@12.5'
TPHmo	<5.0
TPHd	<1.0
TPHg	<1.0
Ben	<0.005
PCE	<0.005

CB3 10/29/12	@12.5'
TPHmo	<5.0
TPHg	<1.0
Ben	<0.005

NEW 10/29/12	@10.5'
TPHmo	3,800
TPHg	2,800
Ben	28

NEWALL–10' 10/2/13	@10'
TPHmo	280
TPHd	330
TPHg	620
Ben	17
PCE	<0.50

SE Corner–10' 10/2/13	@10'
TPHmo	7.7
TPHd	54
TPHg	380
Ben	<0.50
PCE	<0.050

NWW–11–10' 10/2/13	@10'
TPHmo	<5.0
TPHd	1.3
TPHg	1.5
Ben	<0.005
PCE	<0.005

WW–1–9' 10/2/13	@10'
TPHmo	2,100
TPHd	1,300
TPHg	3,200
Ben	<5.0
PCE	<0.50

SWW 10/29/12	@10'
TPHmo	14,000
TPHg	2,000
Ben	20

SWWALL–10' 10/2/13	@10'
TPHmo	<5.0
TPHd	<1.0
TPHg	<1.0
Ben	<0.005
PCE	<0.005

SEW 10/29/12	@10'
TPHmo	8,100
TPHg	4,500
Ben	31

SBOT–10' 10/2/13	@10'
TPHmo	<5.0
TPHd	<1.0
TPHg	11
Ben	<0.005
PCE	<0.005

SWALL–9' 10/2/13	@9'
TPHmo	<5.0
TPHd	<1.0
TPHg	<1.0
Ben	<0.005
PCE	<0.005

TPHmo = Total Petroleum Hydrocarbons as Motor Oil
TPHd = Total Petroleum Hydrocarbons as Diesel
TPHg = Total Petroleum Hydrocarbons as Gasoline
Ben = Benzene
PCE = Tetrachloroethene
All results in milligrams per kilogram (mg/kg)

Sample Excavated and Properly Disposed of.

N
W E
S

0 5 10
Scale: 1" = 10'

LEGEND

- Existing/Destroyed Remediation Well
- AEI Soil Boring (1/12)
- Existing/Destroyed Vapor Probe
- AEI Soil Boring (7/11)
- Groundwater Monitoring Well
- Proposed Vapor Probe
- Grab Sample
- Proposed Building
- 2012 Excavation
- 2013 Excavation
- Former Hydraulic Lift
- Former Hydraulic Lift

DRAFTED BY JAS 3-2-12
REVISED BY JAS 9-3-13

AEI CONSULTANTS
2500 CAMINO DIABLO, WALNUT CREEK

EXCAVATION SAMPLE ANALYTICAL DATA - 2013

1620-1640 PARK STREET
ALAMEDA, CALIFORNIA

FIGURE 6
PROJECT NO. 298931

RECEIVED
By Alameda County Environmental Health at 2:14 pm, Apr 10, 2014

SOIL MANAGEMENT PLAN
540 CLEVELAND AVENUE
ALBANY, CALIFORNIA
RO#3009

PREPARED FOR:
Mr. Walter R. Pierce
Western Forge & Flange
687 County Road 2201
Cleveland, Texas 77328

PREPARED BY:
Ninyo & Moore
Geotechnical and Environmental Sciences Consultants
1956 Webster Street, Suite 400
Oakland, California 94612

April 7, 2014
Project No. 401823001

April 7, 2014
Project No. 401823001

To: Mr. Mark E. Detterman
Alameda County Environmental Health Department
Health Protection
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: Perjury Statement
Soil Management Plan
540 Cleveland Avenue
Albany, California 94706

I declare, under penalty of perjury, that the information or recommendations contained in the attached report are true or correct to the best of my knowledge.

Walter R. Pierce
President and CEO
Western Forge & Flange Company

April 7, 2014
Project No. 401823001

Mr. Walter R. Pierce
Western Forge & Flange
687 County Road 2201
Cleveland, Texas 77328

Subject: Soil Management Plan
540 Cleveland Avenue
Albany, California
RO#3009

Dear Mr. Pierce,

In accordance with your request, Ninyo & Moore has prepared this Soil Management Plan (SMP) for the property located at 540 Cleveland Avenue in Albany, California (site). The SMP provides guidelines for the handling of potentially impacted soils which could be encountered during future construction activities. This SMP should be implemented during construction activities associated with planned development of the site by the City of Albany into a maintenance yard, and future maintenance activities involving subsurface work at the site.

We appreciate the opportunity to be of continued service to you on this project.

Respectfully submitted,

NINYO & MOORE

Professional Geologist
Kristopher M. Larson
No. 8059
State of California

Cem R. Atabek
Senior Project Environmental Engineer

Kris M. Larson, PG
Principal Environmental Geologist

CRA/KML/caa

Distribution: (1) Addressee
(1) Mark Detterman, Alameda County Environmental Health

TABLE OF CONTENTS

Tables

Figures

Appendices

1. INTRODUCTION

This Soil Management Plan (SMP) has been prepared for the property located at 540 Cleveland Avenue in Albany, California (site, Figure 1). The SMP provides guidelines for the handling of potentially impacted materials which could be encountered during future construction activities. This SMP should be implemented during construction activities associated with planned development of the site by the City of Albany (City) into a maintenance yard, and future maintenance activities involving potential subsurface work at the site.

Material excavated during subsurface utility and foundation construction and other activities may be either transported off-site to an appropriate landfill or reused on-site. In the event these excavated materials are temporarily stockpiled on-site, this SMP provides protocol to be followed in association with stockpile management.

This SMP addresses worker health and safety controls, personnel assignments and responsibilities, segregations and management of contaminated and potentially contaminated materials, on-site re-use and, if required, off-site disposal procedures, and provides recommendations to reduce potential exposure to workers and the public from contaminants, if encountered.

2. SITE DESCRIPTION

The subject site is located at 540 Cleveland Avenue in Albany, California (Figure 1). The subject site is located in a commercial/industrial area of Albany between the Interstate 80 and 580 Freeways, and immediately east of a Union Pacific Rail Road (UPRR) right of way (Figure 2). The site is bordered to the north by Albany Steel, to the south by a commercial building (currently occupied by the City of Albany and used as a maintenance yard), and to the east by Cleveland Avenue. The site area is approximately 1.0 acre.

3. SITE BACKGROUND

The following sections describe the historical site use, geology and hydrology of the site, and the results of previous environmental investigations and remediation activities performed at the site.

3.1. Historic Site Use

The subject site recently consisted of an approximately 25,000 square-foot building with concrete and asphalt paved areas. Western Forge & Flange manufactured flanges at the site from 1944 until it moved operations to Texas in 2007. The site building and the majority of pavement surfaces were demolished and removed in June and July of 2013. Several subsurface concrete pits were also demolished during building demolition activities. The walls of the concrete pits were removed to approximately 5 feet below ground surface (bgs), and the foundations of most concrete pits were left in place because they extend to depths which would make removal impractical. The deeper holes (extending below 5 feet bgs) resulting from demolition of the concrete pits were temporarily backfilled with recycled crushed concrete.

3.2. Site Geology and Hydrology

The site is located within the Coast Range Geologic Province. The San Francisco Bay and Bay margin geology was formed by a series of Mesozoic and Cenozoic aged oceanic crust and volcanic arc terranes accreted to the continent. Uplift also occurred due to transpression along the Hayward Fault Zone during the Cenozoic. Bedrock geologic units include Jurassic Coast Range Ophiolite, Late Jurassic-Early Cretaceous Franciscan Complex and Knoxville Formation, and the Late Cretaceous Great Valley Sequence. Late Quaternary deposits consisting of Pleistocene to Holocene alluvial fan deposits overly the bedrock formations within the site area.

The ground surface elevation of the site ranges from approximately 12 to 16 feet above mean sea level (MSL), and ground surface is gently sloped towards the west-southwest. The site sedimentology observed during excavation activities consisted of approximately 2 to 6 feet of fill material over laying native silty clay (bay mud) deposits. The margin of the San Francisco Bay historically crossed through the site, with the western portion of the site historically being tidal wetlands. Fill material was observed to be thinner (extending to approximately 2 feet bgs) in the central portion of the site, and thicker (extending to ap-

proximately 6 feet bgs) in the western portion of the site. The upper 1 to 2 feet of fill material was observed to generally consist of brown sand with gravelly and clay, and the lower portion of fill was observed to generally consist of dark gray silt with sand and clay. Bricks, concrete rubble, and other debris were observed in areas throughout the fill material.

No natural surface water bodies, including ponds, streams, or other bodies of water, are present on the site. The San Francisco Bay is located approximately 500 feet west of the site. During the soil boring advancement conducted for during previous investigations, shallow groundwater was encountered between 2.5 and 5.5 feet bgs in all but one of the borings. Groundwater was encountered at 1 foot bgs in one boring near the northwest corner of the site, which was attributed to a very shallow, perched groundwater zone that has been documented in previous environmental assessments. During excavation activities, groundwater was observed at approximately 4 feet bgs in the south-central portion of the site, and at approximately 6 feet bgs in the western portion of the site. Due to the site's proximity to the San Francisco Bay, tidal fluctuation may affect groundwater depth and flow direction/gradient. Based on the depth and elevation of groundwater measured during a recent (March 2014) groundwater monitoring event, the inferred groundwater flow direction was towards the west with a gradient of approximately 0.004 feet per foot.

3.3. Results of Previous Environmental Investigations and Remediation Activities

Based on data generated during historic episodes of site assessment, soil and groundwater on site were determined to contain elevated concentrations of use-related contaminants attributable to historic site activities. Contaminants of concern (COCs) identified at the site included total petroleum hydrocarbons as hydraulic fluid (TPHho), polycyclic aromatic hydrocarbons (PAHs), and heavy metals including arsenic, chromium, copper, lead, molybdenum, nickel, and zinc. A Revised Data Gap Investigation Report and Corrective Action Plan (CAP) dated May 15, 2013, and CAP Addendum dated July 22, 2013, were prepared for the site by Ninyo & Moore to address impacts from COCs in soil and groundwater in order to protect human health and the environment, and allow the site to be

redeveloped for future commercial/industrial land use. The CAP and CAP Addendum were approved by Alameda County Environmental Health (ACEH) in an e-mail dated October 14, 2013.

CAP implementation occurred between October 2013 and January 2014, and consisted of the removal and off-site (landfill) disposal of approximately 1,200 cubic yards (1,798 tons) of soil impacted with COCs. Clean imported backfill material was used to replace the COCs impacted soil in general accordance with the CAP and CAP Addendum. Approximately 12.5 tons of groundwater impacted with COCs was also removed from the site and disposed of at a landfill during this period. Excavation sidewall and bottom confirmation samples were collected during remediation activities and the sample data was reviewed and evaluated to determine whether Cleanup Goals (CGs) were achieved. CGs were generally based on the San Francisco Bay Regional Water Quality Control Board's (RWQCB's) Environmental Screening Levels (ESLs) for commercial/industrial land use, however site specific CGs were established for arsenic and lead in soil. The areas of excavation and confirmation sample locations are presented on Figure 3, and analytical results for confirmation samples are presented in Tables 1 through 4. Samples previously collected (prior to CAP implementation) from areas of soil which remained on site are presented on Figure 4. Statistical analysis was performed on the data sets for select COCs which had concentrations remaining on site which exceeded CGs to evaluate whether the 95% upper confidence limit (UCL) for remaining concentrations of the select COCs are below their respective CGs. Remaining concentrations of COCs exceeding CGs are indicated on Figures 3 and 4, and copies of the 95% UCL calculations are presented in Appendix A. Based on the confirmation sample data and data from previous samples representing soil that remained on site, the CGs for COCs in soil were met.

Three groundwater monitoring wells (MW-1 through MW-3) were installed in the western portion of the site to monitor post remediation groundwater quality (Figure 3), and groundwater monitoring events were performed in December 2013, and March 2014. Analytical results for groundwater monitoring samples are presented in Tables 1 through 3, and

groundwater depth and elevation information is presented in Table 5. Relatively minor impacts from TPHho were detected in monitoring well MW-1 during the initial groundwater monitoring event, and TPHho was not detected in any of the monitoring wells during the March 2014 monitoring event. Only relatively minor impacts from PAHs (below CGs and drinking water ESLs) have been detected in post remediation groundwater samples. Concentrations of some metals in post remediation groundwater monitoring samples exceeded CGs and/or drinking water ESLs.

The CAP implementation and results of the initial groundwater monitoring event are documented in Ninyo & Moore's Removal Action Completion report (RACR) dated February 6, 2014, which has been submitted to ACEH for review and approval. The results of the 1st Quarter 2014 groundwater monitoring event are documented in Ninyo & Moore's 1st Quarter 2014 Groundwater Monitoring Report dated April 7, 2014, which has been submitted to ACEH for review and approval.

4. DEFINITIONS

Definitions of key terms used in this SMP are provided in the following sections.

4.1. Materials

For purposes of this SMP, the term "materials" refers to soils and/or other surface or subsurface materials that may be encountered during the planned construction.

4.2. Impacted Materials

In the context of this SMP, impacted materials contain a substance, or substances, at concentrations that would: require special training, handling, or the use of personal protective equipment; restrict the end use to protect human health or the environment; be subject to local, state, or federal regulatory requirements; or necessitate an environmentally-related monetary surcharge for handling, transportation, or disposition.

Based on the planned development of the site into a maintenance yard, materials encountered and possibly generated may be considered impacted and may contain chemicals at levels that make it a hazardous substance, or in some cases, a hazardous waste under state and/or federal regulations, unless additional analytical testing confirms otherwise.

Protective measures and equipment to reduce or prevent exposures from the impacted materials which may be generated during this project will be specified in the Project Health and Safety Plan (HSP), discussed in further detail in Section 10.

4.3. Hazardous Substance

A hazardous substance is any substance that is toxic, corrosive, an irritant, a strong sensitizer, flammable, combustible, radioactive, or that may cause personal injury or illness as a proximate result of any customary or reasonable foreseeable handling or use.

4.4. Hazardous Waste

A California-hazardous waste is a contaminated substance that meets the definition of hazardous waste as defined in the California Code of Regulations (CCR) Title 22 Sections 66261.20 through 66261.24. A Resource Conservation and Recovery Act (RCRA)-hazardous waste is a contaminated substance that meets the definition of hazardous waste as defined in 40 Code of Federal Regulations (CFR) Part 261. If materials are transported and disposed of off-site, it is important to note that various permitted landfill and treatment/disposal facilities typically have additional analytical requirements beyond federal and state requirements based on their permits from local and state regulatory agencies.

4.5. Competent Person

A competent person shall have demonstrated knowledge of, and professional experience in, the observation and documentation of environmental excavating activities; environmental and geologic conditions in the project area; and recognition of, and testing for, hazardous materials and conditions. A competent person shall have current Occupational Safety and

Health Administration (OSHA) training and certificates and the authority to respond to changed conditions. Typically, a competent person will be a state-licensed geologist, engineer, or health professional with sufficient knowledge of local conditions and environmental regulations, or a person working under the direct supervision of such a geologist or engineer.

4.6. Construction Area

For the purpose of this SMP, the term "construction area" refers to materials that will be disturbed or encountered by planned project earthwork activities and for purposes of this plan refers to the entire site.

5. CONSTITUENTS OF CONCERN

The primary COCs at the site are PAHs, TPHho, and heavy metals including arsenic, chromium, copper, lead, molybdenum, nickel, and zinc. Although site CGs for soil were achieved based on confirmation sample results and calculation of 95% UCLs as discussed in Section 3.3 above, isolated areas of soil with concentrations of COCs exceeding CGs remain on-site (Figure 3 and 4).

6. WASTE CATEGORIES

COCs- impacted materials may be encountered during planned construction activities associated with developing the site. It is anticipated that materials will be excavated and will be either reused on-site or transported off site to an appropriate landfill.

If excavated contaminated materials are required to be transported off-site, the waste classification of soils will depend on the analytical results of stockpile sampling and analysis.

It is recommended that during any excavation activities, materials suspected to be impacted with COCs be separately stockpiled for purposes of waste characterization and possible off-site disposal. The following describes the potential waste categories.

- RCRA-hazardous wastes will be disposed of at a Class I landfill facility. This waste may require pre-treatment prior to Class I disposal based on the levels of contaminants in the waste.

- Non-RCRA (California) hazardous wastes may be disposed of at a California hazardous waste Class I landfill facility, or at an out-of-state appropriately permitted hazardous waste facility. If transported to an out-of- state facility, the material would be disposed of based on classification in the state where the receiving facility is located.

- Non-hazardous impacted materials may be disposed of at a Class II solid waste facility, or used as daily cover at such a facility, as appropriate.

7. REGULATORY FRAMEWORK

ACEH is the lead regulatory agency for the site. ACEH should be notified if previously unknown areas of impacted materials are discovered at the site.

8. PROJECT TEAM

This section describes the project team relevant to the excavation, handling, transportation, reuse, and, as applicable, off-site disposal of impacted materials, including groundwater if encountered at the site.

8.1. Project Manager

The City's Project Manager for the construction of the maintenance yard is Patrick O'Keeffe. The Project Manager will ensure that Contractors performing subsurface activities receive a copy of the SMP and understand and abide by its guidelines. The Project Manager is responsible for notifying the City's Environmental Consultant and ACEH if previously unknown areas of impacted materials are encountered.

8.2. General Contractor(s)

The General Contractor (Contractor) shall be responsible for project construction in accordance with project documents. The Contractor's scope of work, subject to the bid

documents, will generally include, but not be limited to construction of subsurface utilities, foundation features, above ground structures, and pavement surfaces. The Contractor will be required to implement this SMP that addresses the excavation and management, temporary stockpiling, on-site re-use, and possible off-site disposal of materials, including measures to protect the environment and worker and public health, from potential impacts caused by the Contractor's activities. The Contractor shall be responsible for assigning qualified personnel to execute the work, and for selecting and supervising the work of other subcontractors assigned to the project.

The Contractor shall provide a site Superintendent, who will be responsible for site activities. The site Superintendent's responsibilities will include oversight of equipment, labor, materials, and resources needed to complete the project.

8.3. Site Health and Safety Officer (SHSO)

The Contractor will provide a SHSO, with the appropriate training, certificates, and experience, including the appropriate qualifications to be considered a competent person for oversight of excavation activities. The SHSO will be responsible for preparing and overseeing implementation of HSP. The HSP shall list the various safety-related Contractor personnel and their duties and responsibilities. The HSP is discussed in further detail in Section 10.

8.4. Subcontractors

The Contractor may utilize subcontractors to execute subtasks of this project, subject to approval by the City. The supervision, inspection, and approval of subcontractor work will be the responsibility of the Contractor.

8.5. Project Environmental Consultant

The City will retain an Environmental Consultant to perform environmental oversight and sampling activities if previously unknown areas of impacted materials are encountered. The

Environmental Consultant will monitor excavation activities in areas of impacted materials, and provide guidance to the Contractor on segregation of materials, as necessary. As applicable, they will assist in characterizing and profiling impacted materials, if they are proposed to be transported and disposed of off-site or potentially re-used on-site if determined to be suitable as discussed in Section 12.4 below.

9. NOTIFICATIONS

In addition to required permits, approvals, and notifications required by law, as applicable, the Contractor shall be responsible for notifying California OSHA in accordance with the Contractor's Annual Trenching and Excavation Permit and notifying Underground Service Alert. ACEH should be notified if previously unknown areas of impacted materials are encountered.

Permits for temporary stockpiling of contaminated materials, as applicable, will not be necessary if they are stored on-site less than 90 days. As applicable, the Contractor, with assistance from the Project Manager and Environmental Consultant will ensure that temporary stockpiles are not left on-site for 90 days or more.

10. HSP

Prior to site mobilization, the Contractor shall prepare a Project HSP. The HSP will provide policies, information, requirements, and guidelines to be followed while conducting construction activities including excavation, temporary stockpiling/management/storage, on-site re-use, and as applicable, disposal of waste(s) from the site. The HSP shall be prepared in accordance with the Federal and State OSHA Hazardous Waste Operations and Emergency Response (HAZWOPER) Standards: 29 CFR 1910.120 and 8 CCR Section 5192.

The HSP shall provide for contingencies and be structured to handle a variety of situations that may arise, but be concise enough so that site workers understand the hazards and are able to follow the procedures to reduce the level of risk. Field personnel shall be required to review the HSP and provide written acknowledgement of their review and understanding of the HSP and

willingness to abide by its requirements. In addition, the Contractor's site Superintendent will perform a daily tailgate safety meeting with field personnel handling impacted materials, held at the beginning of each workday, to discuss relevant task-specific safety issues.

11. EXCAVATION AND HANDLING OF MATERIALS

Excavation and materials handling will be performed by hand digging and use of heavy equipment such as excavators, backhoes, scrapers, and loaders, etc. All excavation and handling of materials, on-site re-use, and temporary stockpiling will be performed in accordance with project specifications, the HSP, this SMP, and all applicable local, state, and federal statutes, regulations, and guidelines. Excavation and handling of impacted materials will be conducted in a manner that prevents the release of contamination, if present, to other on-site and off-site-site areas, including measures to protect the environment and worker's and public health. Measures to prevent the release of contamination and protect the environment and worker and public health include: dust control, erosion control best management practices (BMPs), establishing an exclusion zone for working with impacted materials, monitoring of impacted material excavation and handling, and decontamination practices.

11.1. Dust Control

The Contractor will mitigate dust with water, either with a hand held sprayer or by water trucks, as needed, on the surface of active work areas. Care will be exercised to minimize the overuse of water so as not to create surface water runoff or excessively saturated conditions. Dust control will also be conducted on vehicle and equipment paths on-site during construction activities, and vehicles and equipment will be operated at low speeds to minimize the generation of dust.

11.2. BMPs

The Contractor shall implement BMPs to protect the temporary stockpiles and exposed soil surfaces from erosion and storm water run-on and runoff. The BMPs include, but are not limited to, the following:

- erosion control,
- storm water drainage control,
- secondary containment (as applicable),
- fugitive emission control of dust and/or vapors,
- wind dispersion control,
- spill prevention, and
- additional BMPs specified in the project Erosion Control Plan.

11.3. Exclusion Zone

If previously unknown impacted materials are encountered, the area will be cordoned off as an exclusion zone. If the impacted materials are suspected or determined to be hazardous waste, field personnel working in the exclusion zone shall be trained and current in accordance with the standards provided by HAZWOPER (40-hour initial training with annual updates). Appropriate management personnel shall have 8-hour supervisor training. Additional training may be required for personnel engaged in specialized tasks, as appropriate.

11.4. Work Monitoring

The City's Environmental Consultant will monitor excavation and handling of impacted materials, and use appropriate field screening procedures and indicators and project-specific experience to guide the Contractor in segregating the excavated materials.

11.5. Decontamination

Field personnel will perform decontamination activities on clothing and equipment prior to leaving the exclusion zone in order to prevent the spreading of impacted materials into clean areas of the site or off-site. Decontamination procedures will consist of using dry methods (i.e. brooms, brushes, hand tools, etc.) to remove impacted materials from boots, work

clothes, and equipment including vehicle and heavy equipment tires and tracks. Decontamination will be performed over 10-mil plastic sheeting, and removed materials will be swept up and added to the stockpile of impacted materials being excavated.

12. MATERIAL STOCKPILING, SEGREGATION, AND STOCKPILE SAMPLING

Excavated materials may be placed in temporary stockpiles prior to being re-used on-site or transported off-site for disposal. The following sections discuss stockpile construction and management, segregation of materials into different stockpiles, and sampling of stockpiles of materials suspected to be impacted for potential re-use or off-site disposal.

12.1. Stockpile Construction and Management

As applicable, a staging area and the temporary stockpiles will be managed by the Contractor in accordance with this document, the project specifications, and the project Erosion Control Plan. Excavated materials will be stockpiled on 10-mil thick plastic liners. The stockpiles will be covered with 6-mil thick plastic liners secured with sand bags at all times when materials are not being actively added to or removed from the stockpiles. A berm will be constructed around based of the stockpiles to impede materials and water from spilling onto the surrounding soil surface. The berm will be constructed by placing straw waddles beneath the 10-mil plastic liner around the perimeter of the stockpiles areas. Stockpile will be sprayed or misted with water as necessary to minimize dust emissions while adding to or removing materials from stockpiles.

12.2. Segregation of Stockpiles

Excavated materials suspected to be impacted with COCs should be placed in segregated stockpiles from material which appears free of impacts and is suitable for re-use. The City's Environmental Consultant will guide the Contractor in segregating the excavated materials when materials suspected to be impacted with COCs are encountered. Multiple segregated stockpiles may be created for materials suspected to be impacted with different COCs. For

example, material suspected to be impacted with petroleum hydrocarbons and PAHs may be placed in a separate stockpile from material containing metal and/or construction debris which is more likely to be impacted with metals. The segregated stockpiles will be sampled for potential re-use or disposal purposes. Individual stockpile samples location will be noted on a figure, so that the stockpiles can potentially be segregated into different potions for disposal under different waste categories based on analytical results.

12.3. Stockpile Sampling for Landfill Disposal

If a stockpile of impacted material is obviously not suitable for re-use on-site based on geotechnical properties or physical signs of impacts (i.e. heavy staining, strong odors, the presence of metal/debris, etc.), the stockpiles should be tested for landfill disposal purposes. Stockpiles of materials requiring off-site-site disposal will be tested at a frequency of four discrete samples collected for up to 500 cubic yards of stockpiled material, with the four discrete samples being combined by the laboratory into a single composite sample for analysis. The stockpile samples will be analyzed for TPHho using EPA Method 8015 and Title 22 Metals using EPA Method 6010B/7470A. If potential impacts from volatile organic compounds (VOCs) or petroleum hydrocarbons other than TPHho is suspected based on physical signs of impacts, the samples should also be analyzed for TPH as gasoline (TPHg), as diesel (TPHd), and as motor oil (TPHmo) using EPA Method 8015, and VOCs using EPA Method 8260B.

Based on initial stockpile sample results, additional analysis may be required for disposal profiling. If concentrations of COCs in a sample exceeding 10 times their Solubility Threshold Limit Concentration (STLC), the sample will be analyzed for the solubility of those COCs using the Waste Extraction Test (Wet) Method. If the soluble concentrations of COCs (using the WET method) exceed their respective STLCs, the material will be classified as California-hazardous waste. The sample will then be further analyzed for solubility of those COCs exceeding STLCs using the Toxicity Characteristic Leaching Procedure (TCLP) Method to evaluate whether the material would be classified as RCRA-hazardous waste.

Facility requirements shall be determined prior to sampling, and any additional facility-required analysis (beyond that discussed above) will also be conducted. If analytical results for composite samples indicate the stockpile to be California-hazardous or RCRA-hazardous waste, the individual samples may be further analyzed in order to potentially split the stockpile into portions of different waste categories. The impacted material will be transported to the appropriate disposal facility upon receipt and review of the disposal-profile analysis.

12.4. Stockpile Sampling for Potential Re-Use

If there is uncertainty whether a stockpile of material is impacted, and the material is considered suitable for re-use based on geotechnical properties, the material should be tested in accordance with guidelines for potential on-site re-use. The potentially re-usable stockpile will be sampled at a frequency of one 1 discrete sample per approximately 25 cubic yards of soil, in accordance with the guidelines of the RWQCB draft guidance document *Characterization and Reuse of Petroleum Impacted Soil as Inert Waste*, dated October 20, 2006. The stockpile samples will be analyzed for TPHho using EPA Method 8015M, PAHs using EPA Method 8270 SIM, and Title 22 Metals using EPA Method 6010B/7470A. The analytical results for the stockpile samples should be compared to the applicable ESLs for the site in order for the material to be considered for re-use.

13. BACKFILLING EXCAVATIONS AND IMPORTING SOIL

Excavation backfilling or grading may be performed using imported clean fill, clean soil obtained on-site from areas where impacts have not been encountered, or on-site material which was suspected to possibly be impacted, however it is considered suitable for re-use based on the results of stockpile sampling. Backfilling and compaction requirements will be specified by the project Geotechnical Engineer.

Prior to importing fill material to the site, the potential fill material must be sampled and analyzed to show that it is clean. Potential fill material laboratory analysis will include potential contaminants associated with the source area. The analytical results for imported fill material

should be than the applicable ESLs for the site to be acceptable. The proposed import fill material analytical results will be presented to the City's Environmental Consultant for approval prior to importing the material to the site. The potential fill material should be sampled and analyzed according to the Department of Toxic Substances Control (DTSC) criteria set forth in DTSC's Information Advisory, Clean Imported Fill Material (2001) which is included in Appendix B.

14. UNKNOWN CONTAMINATION

This section presents a general protocol regarding what to do when unknown impacts are encountered during intrusive work/construction activities.

If hazardous substances or conditions are encountered which present an immediate threat of injury to human health or water quality, the Contractor shall secure the area and shall notify the City immediately. The Contractor shall call "911" to summon the emergency services, as necessary.

If previously unknown hazardous substances or conditions are encountered that do not present an immediate threat to human health or water quality, the Contractor shall immediately notify the City. As necessary, the area surrounding the discovery of unknown contamination will be isolated and secured by the Contractor with markings, fencing, or a suitable barrier so that construction activities can be excluded from the zone of impacts. The City and their Environmental Consultant will then decide whether immediate excavation, segregation, stockpiling, containerization, or other activities are warranted. ACEH will also be notified of the findings and proposed activities to address the impacts.

15. POTENTIAL DEWATERING

Groundwater at the site is typically encountered at approximately 4 feet bgs, and has been encountered as shallow as 1-foot bgs. Groundwater may be encountered during excavation activities. If dewatering of groundwater will be performed, the groundwater should be pumped into a holding tank and sampled to evaluate potential disposal options. If groundwater is to be

discharged to sanitary sewer, a special discharge permit must be obtained from East Bay Municipal Utility District (EBMUD), and the groundwater must be pumped into a holding tank, sampled, and discharged in accordance with the EBMUD guidelines. If groundwater is to be discharge into a storm drain inlet or surface water body, a National Pollution Discharge Elimination System (NPDES) permit will be needed prior to discharge.

16. TRANSPORT AND DISPOSAL

If off-site transport of unsuitable site materials is necessary, transporters and disposal facilities used must be appropriately licensed and/or permitted and properly insured and be pre-approved by the City. The Contractor, with assistance from the City's Environmental Consultant, will manage the transportation and disposal of wastes to the appropriate treatment and disposal or recycling facilities. The Contractor shall prepare waste profiles and manifests for review by the Environmental Consultant and signature by the City. Manifests and waste profiles will be forwarded to the appropriate disposal/recycling facility for acceptance. The Contractor shall be responsible for the scheduling of shipments of wastes after notice of landfill acceptance.

Coordinating vehicles and vessels entering the site for loading and off-site-site disposal of site materials shall be tracked through documentation, by the Contractor, with assistance from the Environmental Consultant. Vehicles and vessels shall be decontaminated, as necessary, prior to their departure from the site. Care shall be taken to avoid spillage of contaminated materials and/or tracking such materials off-site. The Environmental Consultant shall maintain a daily log of impacted materials removed from the site for disposal. The logs shall include a description of the truck, the date and time the truck left the site, the waste classification of the material being transported, and the destination. Upon project completion, the logs shall be accompanied by copies of waste manifests and load tickets that document receipt of the waste at the permitted facility and the weight of the load.

Hazardous wastes transported off-site for disposal or recycling shall be performed in accordance with Department of Transportation (DOT) Hazardous Material Transportation regulations 49 CFR Parts 171 and 180, 40 CFR Part 262, Subpart B, and Title 22 CCR Section 66262, which

involve packaging, placarding, labeling, and manifesting requirements. Hazardous wastes transported shall also have appropriate certification notices per 40 CFR Par 268 and Title 22 CCR Section 66268. Personnel having the required DOT-training shall perform DOT-related functions, if required.

Contaminated materials characterized as non-hazardous that do not exhibit the DOT hazard class characteristics (i.e., explosives, gases, flammable/combustible liquids, flammable solids/spontaneously combustible materials/dangerous when wet materials, oxidizers and organic peroxides, toxic materials and infectious substances, radioactive materials, and corrosive materials) are not regulated under DOT rules for hazardous materials transportation. If a material is suspected to be hazardous, it shall be shipped under the appropriate hazard class.

Trucks carrying impacted materials shall be covered with tarps to prevent dust during transportation along the haul route identified in the project specifications. Open trucks shall not be permitted to transport waste from the site that may produce odor or dust during transportation.

17. DOCUMENTATION

If impacted materials are excavated during construction activities, the City's Environmental Consultant shall prepare a report summarizing the excavation, stockpiling, sampling, re-use, and transportation and disposal of the excavated materials. The report will include information relating to volumes of materials excavated and reused on-site or disposed off-site-site, and placement locations of on-site reused materials. If materials are transported off-site information will be provided regarding the characterization, handling, and disposition of these materials. The report will be signed by a registered professional (e.g., Professional Engineer or Geologist) and submitted to ACEH.

The report will include the following information:

- Comprehensive documentation pertaining to the source(s), volumes, types of materials, dates, and other relevant information, pertaining to the materials imported to the site for constructing purposes,

- As applicable, identification of each stockpile type, a plot plan detailing the stockpile locations, and corresponding estimates of the volumes of materials in each stockpile. As applicable (e.g., off-site disposal), description of the sampling methodologies and sample location/selection process, and sample locations, a copy of the sample analytical results, chain-of-custody documents, and quality assurance/quality control supporting data, summary tables of the laboratory analytical results of the stockpile sampling,

- If materials are transported off-site, an accounting of the materials transported and disposed of off-site-site, including weight tickets and waste manifests,

18. LIMITATIONS

This SMP has been prepared in general accordance with current regulatory guidelines and the standard-of-care exercised in preparing similar plans in the project area. No warranty, expressed or implied, is made regarding the professional opinions presented in this SMP. Variations in site conditions may exist and conditions not observed or described in this SMP may be encountered during subsequent activities. Please also note that this SMP did not include an evaluation of geotechnical conditions or potential geologic hazards.

Ninyo & Moore's opinions and recommendations regarding environmental conditions, as presented in this SMP, are based on limited subsurface assessments. Further assessment of potential adverse environmental impacts from past on-site and/or nearby use of hazardous materials may be accomplished by a more comprehensive assessment. The samples collected and used for testing, and the observations made, are believed to be representative of the area(s) evaluated; however, conditions can vary significantly between sampling locations. Variations in soil and/or groundwater conditions will exist beyond the points explored.

The environmental interpretations and opinions contained in this SMP are based on the results of laboratory tests and analyses intended to detect the presence and concentration of specific chemical or physical constituents in samples collected from the subject site, and on work performed by others. The testing and analyses have been conducted by independent laboratories, which are certified by the State of California to conduct such tests. Ninyo & Moore has no involvement in, or control over, such testing and analysis or work performed by others.

Ninyo & Moore, therefore, disclaims responsibility for any inaccuracy in such laboratory results and work performed by others.

Our conclusions and opinions are based on an analysis of the observed site conditions and work performed by others. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government action or the broadening of knowledge. The findings of this SMP may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires any additional information, or has questions regarding content, interpretations presented, or completeness of this document.

This SMP is intended exclusively for use by the City. Any use or reuse of the findings, conclusions, and/or recommendations of this SMP by parties other than the client is undertaken at said parties' sole risk.

TABLE 1 - ANALYTICAL RESULTS FOR METALS AND TOTAL DISSOLVED SOLIDS

Sample ID	Date Collected	Antimony	Arsenic	Barium	Beryllium	Cadmium	Total Chromium	Hexavalent Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thalium	Vanadium	Zinc	Mercury	Total Dissolved Solids
Soil Cleanup Goals (mg/kg)		40	7*	1,500	8	12	NE	8	80	230	200**	40	150	10	40	10	200	600	10	NA
Confirmation Sample Results (mg/kg)																				
EX1-B-1-4.0	11/14/13	--	6.1	--	--	--	--	--	--	65	16	<1.9	77	--	--	--	--	--	--	--
EX1-S-1-1.0	1/14/14	--	**12**	--	--	--	--	--	--	49	16	2.4	39	--	--	--	--	--	--	--
EX1-S-2-1.0	1/14/14	--	**9.1**	--	--	--	--	--	--	130	26	21	**380**	--	--	--	--	--	--	--
EX1-S-3-1.0	1/14/14	--	4.3	--	--	--	--	--	--	8.2	3.3	<0.45	24	--	--	--	--	--	--	--
EX2-B-1-6.0	10/24/13	--	--	--	--	--	--	--	--	--	71	--	55	--	--	--	--	73	--	--
EX2-B-2-1.0	10/30/13	--	--	--	--	--	--	--	--	--	--	--	**1,200**	--	--	--	--	--	--	--
EX2-B-3-1.0	10/30/13	--	--	--	--	--	--	--	--	--	--	--	**190**	--	--	--	--	--	--	--
EX2-B-4-2.0	11/1/13	--	--	--	--	--	--	--	--	--	--	--	**190**	--	--	--	--	--	--	--
EX2-B-5-2.0	11/1/13	--	--	--	--	--	--	--	--	--	--	--	110	--	--	--	--	230	--	--
EX2-B-6-3.0	11/7/13	--	--	--	--	--	--	--	--	--	--	--	67	--	--	--	--	--	--	--
EX2-S-1-0.5	10/24/13	--	--	--	--	--	--	--	--	--	--	--	100	--	--	--	--	230	--	--
EX2-S-1-4.5	10/24/13	--	--	--	--	--	--	--	--	--	11		16	--	--	--	--	18	--	--
EX2-S-2-0.5	10/24/13	--	--	--	--	--	--	--	--	--	--	--	**280**	--	--	--	--	240	--	--
EX2-S-2-4.5	10/24/13	--	--	--	--	--	--	--	--	--	17	--	**340**	--	--	--	--	77	--	--
EX2-S-3-0.5	10/24/13	--	--	--	--	--	--	--	--	--	--	--	**250**	--	--	--	--	**1,600**	--	--
EX2-S-3-4.5	10/24/13	--	--	--	--	--	--	--	--	--	23	--	**310**	--	--	--	--	110	--	--
EX2-S-4-0.5	10/24/13	--	--	--	--	--	--	--	--	--	--	--	**220**	--	--	--	--	99	--	--
EX2-S-4-4.5	10/24/13	--	--	--	--	--	--	--	--	--	18	--	40	--	--	--	--	76	--	--
EX2-S-5-0.5	10/28/13	--	--	--	--	--	--	--	--	--	--	--	**270**	--	--	--	--	--	--	--
EX2-S-5-4.5	10/28/13	--	--	--	--	--	--	--	--	--	--	--	86	--	--	--	--	--	--	--
EX2-S-6-0.5	10/28/13	--	--	--	--	--	--	--	--	--	--	--	**610**	--	--	--	--	--	--	--
EX2-S-7-0.5	10/28/13	--	--	--	--	--	--	--	--	--	--	--	**180**	--	--	--	--	400	--	--
EX2-S-7-4.5	10/28/13	--	--	--	--	--	--	--	--	--	--	--	**210**	--	--	--	--	--	--	--
EX2-S-8-0.5	10/30/13	--	--	--	--	--	--	--	--	--	--	--	78	--	--	--	--	--	--	--
EX2-S-9-0.5	10/30/13	--	--	--	--	--	--	--	--	--	--	--	15	--	--	--	--	--	--	--
EX2-S-10-0.5	10/30/13	--	--	--	--	--	--	--	--	--	--	--	**160**	--	--	--	--	--	--	--
EX2-S-10-4.5	10/30/13	--	--	--	--	--	--	--	--	--	--	--	**180**	--	--	--	--	--	--	--
EX2-S-11-0.5	11/1/13	--	--	--	--	--	--	--	--	--	--	--	74	--	--	--	--	--	--	--
EX2-S-11-4.5	11/1/13	--	--	--	--	--	--	--	--	--	--	--	**390**	--	--	--	--	--	--	--
EX2-S-12-4.5	11/7/13	--	--	--	--	--	--	--	--	--	--	--	**330**	--	--	--	--	--	--	--
EX2-S-13-4.5	11/11/13	--	--	--	--	--	--	--	--	--	--	--	79	--	--	--	--	--	--	--
EX3-B-1-2.0	10/23/13	--	--	--	--	--	--	--	--	**300**	--	--	**280**	--	--	--	--	--	--	--
EX3-B-2-3.0	10/25/13	--	--	--	--	--	--	--	--	27	--	--	36	--	--	--	--	--	--	--
EX3-B-3-3.0	10/30/13	--	--	--	--	--	--	--	--	28	--	--	97	--	--	--	--	--	--	--
EX3-B-4-3.0	10/30/13	--	--	--	--	--	--	--	--	36	--	--	--	--	--	--	--	--	--	--
EX3-S-1-1.0	10/23/13	--	--	--	--	--	--	--	--	60	--	--	57	--	--	--	--	--	--	--
EX3-S-2-1.0	10/23/13	--	--	--	--	--	--	--	--	**390**	--	--	140	--	--	--	--	--	--	--
EX3-S-3-1.0	10/23/13	--	--	--	--	--	--	--	--	**1,400**	--	--	**1,200**	--	--	--	--	--	--	--

TABLE 1 - ANALYTICAL RESULTS FOR METALS AND TOTAL DISSOLVED SOLIDS

Sample ID	Date Collected	Antimony	Arsenic	Barium	Beryllium	Cadmium	Total Chromium	Hexavalent Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thalium	Vanadium	Zinc	Mercury	Total Dissolved Solids
Soil Cleanup Goals (mg/kg)		40	7*	1,500	8	12	NE	8	80	230	200**	40	150	10	40	10	200	600	10	NA
EX3-S-4-1.0	10/23/13	--	--	--	--	--	--	--	--	120	--	--	84	--	--	--	--	--	--	--
EX3-S-5-1.0	10/25/13	--	--	--	--	--	--	--	--	**720**	--	--	**720**	--	--	--	--	--	--	--
EX3-S-6-1.0	10/25/13	--	--	--	--	--	--	--	--	**290**	--	--	--	--	--	--	--	--	--	--
EX3-S-7-1.0	10/29/13	--	--	--	--	--	--	--	--	**2,300**	--	--	**2,700**	--	--	--	--	--	--	--
EX3-S-8-1.0	10/29/13	--	--	--	--	--	--	--	--	220	--	--	--	--	--	--	--	--	--	--
EX3-S-9-1.0	10/30/13	--	--	--	--	--	--	--	--	**310**	--	--	**670**	--	--	--	--	--	--	--
EX3-S-10-1.0	10/30/13	--	--	--	--	--	--	--	--	62	--	--	--	--	--	--	--	--	--	--
EX3-S-11-1.0	11/1/13	--	--	--	--	--	--	--	--	15	--	--	43	--	--	--	--	--	--	--
EX3-S-12-1.0	11/1/13	--	--	--	--	--	--	--	--	49	--	--	44	--	--	--	--	--	--	--
EX3-S-13-1.0	11/1/13	--	--	--	--	--	--	--	--	110	--	--	**200**	--	--	--	--	--	--	--
EX3-S-14-1.0	11/7/13	--	--	--	--	--	--	--	--	--	--	--	42	--	--	--	--	--	--	--
EX4-B-1-3.5	10/24/13	--	--	--	--	--	--	--	--	--	--	--	110	--	--	--	--	--	--	--
EX4-S-1-1.5	10/24/13	--	--	--	--	--	--	--	--	--	--	--	**190**	--	--	--	--	--	--	--
EX4-S-2-1.5	10/24/13	--	--	--	--	--	--	--	--	--	--	--	100	--	--	--	--	--	--	--
EX4-S-3-1.5	10/24/13	--	--	--	--	--	--	--	--	--	--	--	110	--	--	--	--	--	--	--
EX4-S-4-1.5	10/28/13	--	--	--	--	--	--	--	--	--	--	--	38	--	--	--	--	--	--	--
EX5-B-2-6.0	10/28/13	<1.9	<3.9	130	0.55	<0.49	13	<0.99	5.3	8.1	6.4	<1.9	9.8	<3.9	<0.97	<1.9	23	13	0.02	--
EX5-S-2-2.5	10/24/13	<1.8	3.6	580	<0.36	<0.45	28	--	6.6	29	68	2.0	33	<3.6	<0.91	<1.8	28	130	0.72	--
EX5-S-3-2.5	10/24/13	<2.0	<4.0	730	0.55	<0.50	17	--	5.1	12	44	<2.0	16	<4.0	<1.0	<2.0	22	71	0.25	--
EX5-S-4-2.5	10/24/13	4.4	**14**	300	<0.39	0.89	520	--	20	**270**	**390**	**56**	**780**	<3.9	<0.98	<2.0	42	420	0.27	--
EX5-S-5-2.5	10/28/13	--	<3.8	--	--	--	--	<1.0	--	6.2	5.1	<1.9	12	--	--	--	--	--	--	--
EX6-B-1-2.5	10/24/13	--	--	--	--	--	--	--	--	--	--	--	46	--	--	--	--	25	--	--
EX6-S-1-1.5	10/24/13	--	--	--	--	--	--	--	--	--	--	--	**230**	--	--	--	--	39	--	--
EX6-S-2-1.5	10/24/13	--	--	--	--	--	--	--	--	--	--	--	76	--	--	--	--	46	--	--
EX6-S-3-1.5	10/24/13	--	--	--	--	--	--	--	--	--	--	--	37	--	--	--	--	23	--	--
EX6-S-4-1.5	10/28/13	--	--	--	--	--	--	--	--	--	--	--	91	--	--	--	--	--	--	--
EX7-B-1-7.0	10/24/13	--	<3.8	--	--	--	--	--	--	--	--	--	13	--	--	--	--	--	--	--
EX7-B-2-7.0	10/25/13	--	<3.1	--	--	--	--	--	--	--	--	--	11	--	--	--	--	--	--	--
EX7-B-3-7.0	10/23/13	--	<3.7	--	--	--	--	--	--	--	--	--	29	--	--	--	--	--	--	--
EX7-B-4-7.0	10/25/13	<1.6	4.4	91	0.7	<0.39	24		7.8	7.4	12	<1.6	14	<3.1	<0.78	<1.6	36	18	0.094	
EX7-S-1-5.0	10/24/13	<2.0	**7.4**	220	0.62	<0.50	50	--	18	27	27	2.2	86	<4.0	<1.0	<2.0	41	55	0.085	--
EX7-S-2-5.5	10/24/13	<2.0	6.3	200	<0.36	<0.45	44	--	8.6	23	120	<1.8	41	<3.6	<0.9	<1.8	34	72	0.068	--
EX7-S-3-5.5	10/24/13	--	<3.7	--	--	--	--	--	--	--	--	--	9.9	--	--	--	--	--	--	--
EX7-S-4-5.5	10/24/13	<1.8	<3.6	510	0.42	<0.45	28	--	5.3	29	150	<1.8	15	<3.6	<0.89	<1.8	26	100	0.92	--
EX7-S-5-5.5	10/25/13	<1.7	5.5	160	<0.34	<0.43	16	--	3.5	39	160	<1.7	16	<3.4	<0.86	<1.7	28	42	0.13	--
EX7-S-6-5.5	10/25/13	--	**7.1**	--	--	--	--	--	--	--	--	--	15	--	--	--	--	--	--	--
EX7-S-7-4.5	10/23/13	--	4.5	--	--	--	--	--	--	--	--	--	52	--	--	--	--	--	--	--
EX7-S-8-5.0	10/28/13	--	<3.7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
EX7-S-9-5.0	10/28/13	--	<4.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
EX7-S-10-5.5	10/30/13	--	<3.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
EX9-B-1-3.0	10/23/13	--	**9.0**	--	--	--	--	--	--	150	--	26	**160**	--	--	--	--	--	--	--
EX9-B-2-4.0	10/25/13	--	<3.8	--	--	--	--	--	--	--	--	--	14	--	--	--	--	--	--	--

TABLE 1 - ANALYTICAL RESULTS FOR METALS AND TOTAL DISSOLVED SOLIDS

Sample ID	Date Collected	Antimony	Arsenic	Barium	Beryllium	Cadmium	Total Chromium	Hexavalent Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thalium	Vanadium	Zinc	Mercury	Total Dissolved Solids
Soil Cleanup Goals (mg/kg)		40	7*	1,500	8	12	NE	8	80	230	200**	40	150	10	40	10	200	600	10	NA
EX9-B-3-3.0	10/30/13	<2.0	<4.0	330	0.47	<0.5	22	--	5.8	110	46	<2.0	15	<4.0	<0.99	<2.0	31	71	0.4	--
EX9-S-1-1.0	10/23/13	--	**7.2**	--	--	--	--	--	--	66	--	6.5	110	--	--	--	--	--	--	--
EX9-S-2-1.0	10/23/13	--	6.2	--	--	--	--	--	--	150	--	31	140	--	--	--	--	--	--	--
EX9-S-3-1.0	10/23/13	--	5.1	--	--	--	--	--	--	24	--	3.8	32	--	--	--	--	--	--	--
EX9-S-4-1.0	10/23/13	--	5.8	--	--	--	--	--	--	200	--	**48**	**200**	--	--	--	--	--	--	--
EX9-S-5-1.0	10/25/13	--	--	--	--	--	--	--	--	--	--	**54**	**320**	--	--	--	--	--	--	--
EX9-S-6-1.0	11/7/13	--	--	--	--	--	--	--	--	--	--	7.0	82	--	--	--	--	--	--	--
EX11-B-1-6.0	10/25/13	--	--	--	--	--	--	--	--	--	10	--	--	--	--	--	--	--	--	--
EX11-S-1-4.5	10/25/13	--	--	--	--	--	--	--	--	--	43	--	--	--	--	--	--	--	--	--
EX11-S-2-4.5	10/25/13	--	--	--	--	--	--	--	--	--	**200**	--	--	--	--	--	--	--	--	--
EX11-S-3-4.5	10/25/13	--	--	--	--	--	--	--	--	--	170	--	--	--	--	--	--	--	--	--
EX11-S-4-4.5	10/25/13	--	--	--	--	--	--	--	--	--	**210**	--	--	--	--	--	--	--	--	--
EX12-B-1-2.0	10/28/13	--	--	--	--	--	--	--	--	51	--	--	84	--	--	--	--	--	--	--
EX12-B-2-2.0	10/30/13	--	--	--	--	--	--	--	--	45	--	--	91	--	--	--	--	--	--	--
EX12-B-3-2.0	11/7/13	--	--	--	--	--	--	--	--	5.9	--	--	13	--	--	--	--	--	--	--
EX12-S-1-1.0	10/28/13	--	--	--	--	--	--	--	--	**240**	--	--	**420**	--	--	--	--	--	--	--
EX12-S-2-1.0	10/28/13	--	--	--	--	--	--	--	--	**1,200**	--	--	**1,900**	--	--	--	--	--	--	--
EX12-S-3-1.0	10/28/13	--	--	--	--	--	--	--	--	110	--	--	20	--	--	--	--	--	--	--
EX12-S-4-1.0	10/28/13	--	--	--	--	--	--	--	--	130	--	--	**170**	--	--	--	--	--	--	--
EX12-S-5-1.0	10/30/13	--	--	--	--	--	--	--	--	**630**	--	--	**1,100**	--	--	--	--	--	--	--
EX12-S-6-1.0	10/30/13	--	--	--	--	--	--	--	--	6.3	--	--	12	--	--	--	--	--	--	--
EX12-S-7-1.0	10/30/13	--	--	--	--	--	--	--	--	--	--	--	7.6	--	--	--	--	--	--	--
EX12-S-8-1.0	10/30/13	--	--	--	--	--	--	--	--	**320**	--	--	**820**	--	--	--	--	--	--	--
EX12-S-9-1.0	11/1/13	--	--	--	--	--	--	--	--	**500**	--	--	**730**	--	--	--	--	--	--	--
EX12-S-10-1.0	11/7/13	--	--	--	--	--	--	--	--	170	--	--	**420**	--	--	--	--	--	--	--
EX12-S-11-1.0	11/11/13	--	--	--	--	--	--	--	--	--	--	--	38	--	--	--	--	--	--	--
EX13-B-1-2.5	10/28/13	--	--	--	--	--	--	--	--	--	52	--	--	--	--	--	--	--	--	--
EX13-S-1-1.0	10/28/13	--	--	--	--	--	--	--	--	--	43	--	--	--	--	--	--	--	--	--
EX13-S-2-1.0	10/28/13	--	--	--	--	--	--	--	--	--	140	--	--	--	--	--	--	--	--	--
EX13-S-3-1.0	10/28/13	--	--	--	--	--	--	--	--	--	16	--	--	--	--	--	--	--	--	--
EX13-S-4-1.0	10/28/13	--	--	--	--	--	--	--	--	--	33	--	--	--	--	--	--	--	--	--
EX14-B-1-1.5	10/28/13	<1.9	3.9	280	0.54	0.57	43	--	8.6	50	150	7.1	61	<3.8	<0.95	<1.9	28	240	0.46	--
EX14-B-2-2.0	10/30/13	2	**12**	880	<0.39	0.89	11	--	3.1	130	**240**	<2.0	9.3	<3.9	2.1	<2.0	13	240	1.5	--
EX14-B-3-3.0	11/4/13	--	**8.8**	--	--	--	--	--	--	--	**640**	--	--	--	--	--	--	--	--	--
EX14-B-4-4.0	11/7/13	--	<4.0	--	--	--	--	--	--	--	5.8	--	--	--	--	--	--	--	--	--
EX14-B-5-4.0	11/7/13	--	--	--	--	--	--	--	--	--	45	--	--	--	--	--	--	--	--	--
EX14-S-1-0.5	10/30/13	<2.0	<4.0	260	<0.4	<0.5	130	--	8.7	64	96	**56**	**270**	<4.0	<1.0	<2.0	20	250	0.44	--
EX14-S-2-0.5	10/28/13	<1.9	4.2	240	0.55	1	46	--	6.5	67	**240**	2.6	23	<3.8	<0.95	<1.9	24	580	0.39	--
EX14-S-3-0.5	10/28/13	<1.7	**9.3**	220	0.43	3.5	480	--	**83**	**330**	**550**	**97**	**470**	<3.4	6.2	<1.7	32	**800**	0.72	--
EX14-S-4-0.5	10/30/13	--	--	--	--	--	--	--	--	--	**390**	--	--	--	--	--	--	--	--	--
EX14-S-5-0.5	10/30/13	--	--	--	--	--	--	<0.97	--	--	150	--	--	--	--	--	--	--	--	--
EX14-S-6-0.5	10/30/13	<2.0	4.8	250	0.52	0.61	15	<1.0	4.5	27	180	<2.0	12	<3.9	<0.98	<2.0	17	150	0.63	--
EX14-S-7-1.5	10/30/13	2.9	**12**	730	<0.39	0.75	15	--	3.9	140	**300**	<1.9	12	<3.9	3.2	<1.9	17	270	2.5	--
EX14-S-8-0.5	11/4/13	--	--	--	--	--	19	--	--	--	--	<1.9	11	--	--	--	--	--	--	--

TABLE 1 - ANALYTICAL RESULTS FOR METALS AND TOTAL DISSOLVED SOLIDS

Sample ID	Date Collected	Antimony	Arsenic	Barium	Beryllium	Cadmium	Total Chromium	Hexavalent Chromium	Cobalt	Copper	Lead	Molybdenum	Nickel	Selenium	Silver	Thalium	Vanadium	Zinc	Mercury	Total Dissolved Solids
Soil Cleanup Goals (mg/kg)		40	7*	1,500	8	12	NE	8	80	230	200**	40	150	10	40	10	200	600	10	NA
EX14-S-9-0.5	11/4/13	--	--	--	--	--	--	--	--	--	**390**	--	--	--	--	--	--	--	--	--
EX14-S-10-0.5	11/4/13	--	--	--	--	--	--	--	--	--	**390**	--	--	--	--	--	--	--	--	--
EX14-S-11-1.5	11/4/13	--	**13**	--	--	--	--	--	--	--	**500**	--	--	--	--	--	--	--	--	--
EX14-S-12-2.0	11/4/13	--	**10**	--	--	--	--	--	--	--	150	--	--	--	--	--	--	--	--	--
EX14-S-13-0.5	11/7/13	--	--	--	--	--	--	--	--	--	110	--	--	--	--	--	--	--	--	--
EX14-S-14-0.5	11/7/13	--	--	--	--	--	--	--	--	--	**360**	--	--	--	--	--	--	--	--	--
EX14-S-15-1.5	11/7/13	--	<3.7	--	--	--	--	--	--	--	**240**	--	--	--	--	--	--	--	--	--
EX14-S-16-0.5	11/11/13	--	--	--	--	--	--	--	--	--	170	--	--	--	--	--	--	--	--	--
EX14-S-17-1.5	11/11/13	--	--	--	--	--	--	--	--	--	**630**	--	--	--	--	--	--	--	--	--
EX15-B-1-1.0	10/30/13	<1.9	<3.7	110	<0.39	<0.46	38	--	4	42	160	4.8	97	<3.7	1.1	<1.9	32	110	0.16	--
EX15-B-2-1.0	10/30/13	<1.9	<3.8	200	0.44	<0.48	47	--	6.4	23	71	<1.9	21	<3.8	<0.96	<1.9	31	61	0.093	--
Groundwater Monitoring Well Sample Results (mg/L)																				
MW-1	12/5/13	<0.010	0.017	0.074	<0.0020	<0.0020	<0.010	<0.010	<0.0020	**0.021**	**0.0094**	**0.99**	**0.033**	<0.020	<0.0050	<0.010	0.018	<0.020	**0.00022**	1,400
MW-1	3/24/2014	<0.010	0.018	0.032	<0.0020	<0.0020	<0.010	<0.0005	<0.0020	**0.037**	**0.019**	**0.67**	**0.043**	<0.020	<0.0050	<0.010	**0.022**	<0.020	<0.00020	1,100
MW-2	12/5/13	<0.010	0.011	0.11	<0.0020	<0.0020	<0.010	<0.010	**0.0056**	**0.020**	<0.0050	**0.58**	**0.037**	<0.020	<0.0050	<0.010	0.012	0.047	**0.00027**	1,800
MW-2	3/24/2014	<0.010	<0.010	0.036	<0.0020	<0.0020	<0.010	<0.0005	<0.0020	<0.020	<0.0050	**0.55**	**0.018**	<0.020	<0.0050	<0.010	0.015	<0.020	<0.00020	1,100
MW-3	12/5/13	<0.010	<0.010	0.15	<0.0020	<0.0020	<0.010	<0.010	0.0028	<0.020	**0.0099**	<0.010	**0.030**	<0.020	<0.0050	<0.010	<0.010	0.047	**0.00021**	1,800
MW-3	3/24/2014	<0.010	0.014	0.04	<0.0020	<0.0020	<0.010	<0.0005	0.0023	<0.020	<0.0050	<0.010	**0.019**	<0.020	<0.0050	<0.010	<0.010	<0.020	<0.00020	1,200
Groundwater Cleanup Goals (mg/L)		0.030	0.036	1	0.00053	0.00025	0.18	0.011	0.003	0.0031	0.0025	0.24	0.0082	0.005	0.00019	0.004	0.019	0.081	0.000025	NA
Drinking Water ESLs (mg/L)		0.006	0.01	1	0.004	0.005	0.05	0.00002	0.0047	1.0	0.015	0.078	0.1	0.05	0.1	0.002	0.050	5	0.002	NA

Notes

Metals analyzed by EPA Method 6010B, 7470A (mercury), and 7196A (hexavalent chromium)

Total Dissolved Solids analyzed by EPA Method SM 2540C

-- = not analyzed

ESLs = San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels

Groundwater Cleanup Goals = ESLs Table F-1b, Groundwater is not a current or potential drinking water resource, dated May 2013

Soil Cleanup Goals = ESLs Table B-2, Commercial/Industrial Land Use, Groundwater is not a current or potential source of drinking water, dated May 2013

Drinking Water ESLs = ESLs Table F-3, dated December 2013

* indicates a site specific cleanup goal of 7 mg/kg is used for arsenic based on statistical analysis of naturally occurring background concentrations

** indicates a site specific cleanup goal of 200 mg/kg will be used for lead, which is below the ESL of 320 mg/kg

*** indicates water sample were unfiltered and analyzed for total metals as required for waste disposal profiling, and not dissolved metals which cleanup goals and ESLs are based on.

EBMUD - East Bay Municipal Utility District

<x = less than laboratory reporting limit of x

NA = not applicable

mg/kg = milligrams per kilogram

mg/L= milligrams per liter

Bold indicates concentration equal to or exceeding Cleanup Goa

Values outlined in bold exceed Drinking Water ESLs

Grey Shading indicates soil represented by sample was over-excavated

Ninyo & Moore

TABLE 2 - ANALYTICAL RESULTS FOR PETROLEUM HYDROCARBONS

Sample ID	Date Collected	TPHho	TPHd	TPHmo
Soil Cleanup Goals (mg/kg)		2,500	500	2,500
Confirmation Sample Results (mg/kg)				
EX5-B-1-5.0	10/24/13	1,100	--	--
EX5-B-2-6.0	10/28/13	<50	--	--
EX5-S-1-2.5	10/24/13	1,600	--	--
EX5-S-2-2.5	10/24/13	75	--	--
EX5-S-3-2.5	10/24/13	< 49	--	--
EX5-S-4-2.5	10/24/13	930	--	--
EX7-B-1-7.0	10/24/13	< 49	--	--
EX7-B-2-7.0	10/25/13	<50	--	--
EX7-B-3-7.0	10/23/13	< 49	--	--
EX7-B-4-7.0	10/25/13	< 49	--	--
EX7-S-1-5.0	10/24/13	< 50	--	--
EX7-S-2-5.5	10/24/13	94	--	--
EX7-S-3-5.5	10/24/13	< 50	--	--
EX7-S-4-5.5	10/24/13	< 50	--	--
EX7-S-5-5.5	10/25/13	570	--	--
EX7-S-6-5.5	10/25/13	280	--	--
EX7-S-7-4.5	10/23/13	< 50	--	--
EX8-B-1-2.0	10/28/13	**11,000**	--	--
EX8-B-2-2.0	10/28/13	**8,600**	--	--
EX8-B-3-3.0	11/1/13	2,400	--	--
EX8-S-1-1.0	10/28/13	350	--	--
EX8-S-2-1.0	10/28/13	980	--	--
EX8-S-3-1.0	10/28/13	< 49	--	--
EX9-B-3-3.0	10/30/13	--	7.5	<50
EX10-B-1-6.0	10/25/13	< 50	--	--
EX10-S-1-4.5	10/25/13	120	--	--
EX10-S-2-4.5	10/25/13	53	--	--
EX15-B-1-1.0	10/30/13	--	100	160
EX15-B-2-1.0	10/30/13	--	15	<49
Groundwater Monitoring Well Sample Results (µg/L)				
MW-1	12/5/13	230	--	--
MW-1	3/24/2014	<100	--	--
MW-2	12/5/13	<100	--	--
MW-2	3/24/2014	<100	--	--
MW-3	12/5/13	<100	--	--
MW-3	3/24/2014	<100	--	--
Groundwater Cleanup Goals (µg/L)		640	640	640
Drinking Water ESLs (µg/L)		100	100	100

Notes

TPHho, TPHd, and TPHmo = total petroleum hydrocarbons as hydraulic oil, diesel, and motor oil, analyzed by EPA Method 8015B
Oil & Grease analzyed by EPA Method 1664
TPHg = total petroleum hydrocarbons as gasoline analyzed by EPA Method 8260B
VOCs = volatile organic comounds analyzed by EPA Method 8260B
pH analyzed by EPA Method 9040B
-- = not analyzed
ESLs = San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels resource, dated May 2013

Soil Cleanup Goals = ESLs Table B-2, Commercial/Industrial Land Use, Groundwater is not a current or potential source of drinking water, dated May 2013
Drinking Water ESLs = ESLs Table F-3, dated December 2013
EBMUD - East Bay Municipal Utility District
*indicates discharge limit is for total identifiable chlorinated hydrocarbons
<x = less than laboratory reporting limit of x
NA = not applicable
ND = not detected (laboratory reporting limts vary, see lab report)
mg/kg = milligrams per kilogram
µg/L= micrograms per liter
Bold indicates concentration exceeding Cleanup Goal

Values	outlined in bold exceed Drinking Water ESLs
Grey Shading	indicates soil represented by sample was over-excavated

TABLE 3 - ANALYTICLA RESULTS FOR PAHs and SVOCs

Sample ID	Date	PAHs																SVOCs		
		Acenaphthene	Acenaphthylene	Anthracene	Benzo[a]anthracene	Benzo[a]pyrene	Benzo[b]flouranthene	Bonz[g, h,i]perylene	Benzo[k]fluoranthene	Chrysene	Dibenz(a, h)anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene	2-Methylnaphthalene	Dibenzofuran	All Other SVOCs
Soil Cleanup Goals (µg/kg)		19,000	13,000	2,800	450	45	450	27,000	450	4,500	130	40,000	8,900	450	4,800	11,000	85,000	250	NA	NA
Confirmation Sample Results (µg/kg)																				
EX5-B-1-5.0	10/24/13	200	< 49	83	100	**63**	75	< 49	< 49	170	< 49	250	170	< 49	130	450	320	--	--	--
EX5-B-2-6.0	10/28/13	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	--	--	--
EX5-B-3-6.0	10/28/13	--	--	--	--	**79**	--	--	--	--	--	--	--	--	--	--	--	--	--	--
EX5-B-4-7.0	10/30/13	--	--	--	--	<5	--	--	--	--	--	--	--	--	--	--	--	--	--	--
EX5-S-1-2.5	10/24/13	540	140	340	**510**	**340**	270	110	270	610	< 50	760	490	110	320	1,400	930	--	--	--
EX5-S-2-2.5	10/24/13	< 4.9	15	9.5	35	31	30	20	34	54	< 4.9	82	8.5	19	13	100	93	--	--	--
EX5-S-3-2.5	10/24/13	9.1	8.3	6.3	11	14	14	9.6	17	27	< 4.9	46	8.3	8.8	15	62	49	--	--	--
EX5-S-4-2.5	10/24/13	3,500	< 250	**4,200**	**8,000**	**5,400**	**5,500**	2,000	**5,000**	**7,300**	**990**	16,000	2,900	**2,000**	2,600	**17,000**	14,000	--	--	--
EX5-S-5-2.5	10/28/13	< 5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	--	--	--
EX5-S-6-2.5	10/28/13	7.5	<5	7.5	18	9.9	19	5.9	15	27	<5	45	7	5.6	5.5	45	49	--	--	--
EX7-B-1-7.0	10/24/13	< 5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	--	--	--
EX7-B-2-7.0	10/25/13	< 5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	--	--	--
EX7-B-3-7.0	10/23/13	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	< 4.9	--	--	--
EX7-B-4-7.0	10/25/13	< 5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	--	--	--
EX7-S-1-5.0	10/24/13	< 5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.7	9.7	9.7	9.7	11	9.8	--	--	--
EX7-S-2-5.5	10/24/13	9.3	<5	<5	<5	<5	<5	<5	<5	<5	<5	11	5.1	<5	<5	18	9.5	--	--	--
EX7-S-3-5.5	10/24/13	< 5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	--	--	--
EX7-S-4-5.5	10/24/13	< 4.9	5.8	6.4	35	29	22	15	25	36	5.2	48	< 4.9	14	< 4.9	23	52	--	--	--
EX7-S-5-5.5	10/25/13	< 50	< 50	< 50	< 50	< 50	< 50	< 50	< 50	56	< 50	100	< 50	< 50	< 50	100	94	--	--	--
EX7-S-6-5.5	10/25/13	<25	35	28	120	**92**	92	52	94	150	<25	250	<25	54	91	260	250	--	--	--
EX7-S-7-4.5	10/23/13	<5	14	15	57	**51**	49	39	39	68	8.1	110	8.0	32	35	81	120	--	--	--
EX7-S-10-5.5	10/30/13	--	--	--	--	<4.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--
EX8-B-1-2.0	10/28/13	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	--	--	--
EX8-B-2-2.0	10/28/13	<99	<99	<99	<99	<99	<99	<99	<99	<99	<99	<99	<99	<99	<99	<99	<99	--	--	--
EX8-B-3-3.0	11/1/13	--	--	--	--	<4.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--
EX8-S-1-1.0	10/28/13	<5	<5	<5	9.7	11	13	7.4	9.6	18	<5	31	<5	6.6	5.7	34	33	--	--	--
EX8-S-2-1.0	10/28/13	6.4	< 4.9	6.9	12	10	11	7.3	10	22	< 4.9	30	8.5	5.7	14	38	34	--	--	--
EX8-S-3-1.0	10/28/13	<5	9.5	6.3	21	23	21	17	23	44	6.1	49	<5	12	9.5	41	50	--	--	--
EX9-B-3-3.0	10/30/13	<66	<66	<66	<330	<66	<66	<66	<66	79	<66	120	<66	<66	<66	180	180	<66	<66	ND
EX10-B-1-6.0	10/25/13	< 5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	--	--	--
EX10-S-1-4.5	10/25/13	< 25	26	32	77	**80**	80	50	71	110	< 25	180	< 25	45	39	180	180	--	--	--
EX10-S-2-4.5	10/25/13	<5	<5	<5	8.5	13	11	8.6	10	14	<5	18	<5	7.4	<5	16	22	--	--	--
EX10-S-3-4.5	10/29/13	--	--	--	--	**68**	--	--	--	--	--	--	--	--	--	--	--	--	--	--
EX10-S-4-4.5	11/1/13	--	--	--	--	15	--	--	--	--	--	--	--	--	--	--	--	--	--	--
EX15-B-1-1.0	10/30/13	1,500	<330	740	<1,600	<330	<330	<330	<330	450	<330	2,000	1,500	<330	1,400	4,000	2,100	**1,100**	920	ND
EX15-B-2-1.0	10/30/13	<130	<130	<130	<650	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	<130	170	<130	<130	ND
EX15-B-3-1.5	11/1/13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	**1,600**	--	--
EX15-B-4-2.5	11/7/13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<20	--	--
EX15-S-1-1.0	11/1/13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<9.9	--	--
EX15-S-2-1.0	11/1/13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<99	--	--
EX15-S-3-1.0	11/1/13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	150	--	--
EX15-S-4-1.0	11/1/13	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	150	--	--

TABLE 3 - ANALYTICLA RESULTS FOR PAHs and SVOCs

Sample ID	Date	PAHs																SVOCs		
		Acenaphthene	Acenaphthylene	Anthracene	Benzo[a]anthracene	Benzo[a]pyrene	Benzo[b]flouranthene	Bonz[g, h,i]perylene	Benzo[k]fluoranthene	Chrysene	Dibenz(a, h)anthracene	Fluoranthene	Fluorene	Indeno[1,2,3-cd]pyrene	Naphthalene	Phenanthrene	Pyrene	2-Methylnaphthalene	Dibenzofuran	All Other SVOCs
Soil Cleanup Goals (µg/kg)		19,000	13,000	2,800	450	45	450	27,000	450	4,500	130	40,000	8,900	450	4,800	11,000	85,000	250	NA	NA
Confirmation Sample Results (µg/kg)																				
Groundwater Monitoring Well Sample Results (µg/L)																				
MW-1	12/5/13	0.28	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.99	<0.10	<0.10	--	--	--
MW-1	3/24/2014	0.80	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.26	<0.10	5.2	0.24	<0.10	--	--	--
MW-2	12/5/13	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	--
MW-2	3/24/2014	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.12	<0.10	<0.10	--	--	--
MW-3	12/5/13	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	--
MW-3	3/24/2014	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	--
Groundwater Cleanup Goals (µg/L)		23	30	0.73	0.027	0.014	0.056	0.10	0.40	0.35	0.25	8	3.9	0.056	24	4.6	2	NA	NA	NA
Drinking Water ESLs (µg/L)		20	2,000	22	0.056	0.2	0.056	0.13	0.056	0.56	0.016	130	630	0.056	6.1	410	68	NA	NA	NA

Notes

PAHs = polycyclic aromatic hydrocarbons analzyed by EPA Method 8270 SIM

SVOCs = semi-volatile organic compounds analzyed by EPA Method 8270C

-- = not analyzed

ESLs = San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels

Groundwater Cleanup Goals = ESLs Table F-1b, Groundwater is not a current or potential drinking water resource, dated May 2013

Soil Cleanup Goals = ESLs Table B-2, Commercial/Industrial Land Use, where groundwater is not a current or potential source of drinking water, dated May 2013

Drinking Water ESLs = ESLsTable F-3, dated December 2013

<x = less than laboratory reporting limit of x

ND = not detected (laboratory reporting limts vary, see lab report)

NA = not applicable

µg/kg = micrograms per kilogram

Bold indicates concentration exceeding Cleanup Goal

Grey Shading indicates soil represented by sample was over-excavated

TABLE 4 - ANALYTICLA RESULTS FOR PCBs

		PCB-1254	All Other PCBs
	Soil Cleanup Goals (µg/kg)	250	250
Sample ID	**Date Collected**	**Confirmation Sample Results (µg/kg)**	
EX9-B-3-3.0	10/30/13	<49	<49
EX15-B-1-1.0	10/30/13	62	<49
EX15-B-2-1.0	10/30/13	57	<49

Notes

PCBs = Polychlorinated Biphenyls analyzed by EPA Method 8082

<x = less than laboratory reporting limit of x

µg/kg= micrograms per kilogram

ESLs = San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels dated May 2013

Soil Cleanup Goals = ESLs Table B-2, Commercial/Industrial Land Use, Groundwater is not a current or potential source of drinking water

Grey Shading indicates soil represented by sample was over-excavated

TABLE 5 - GROUNDWATER DEPTH AND ELEVATION DATA						
Monitoring Well ID	**TOC Elevation** (ft msl)	**Ground Surface Elevation** (ft msl)	**Measurement Date**	**Depth to Groundwater** (ft btoc)	**Depth to Groundwater** (ft bgs)	**Groundwater Elevation** (ft msl)
MW-1	15.76	12.9	12/3/2013	7.62	4.8	8.14
			12/5/2013	7.59	4.7	8.17
			3/24/2014	5.25	2.4	10.51
MW-2	15.47	12.6	12/3/2013	7.31	4.4	8.16
			12/5/2013	7.28	4.4	8.19
			3/24/2014	4.95	2.1	10.52
MW-3	15.17	12.3	12/3/2013	5.47	2.6	9.70
			12/5/2013	5.79	2.9	9.38
			3/24/2014	4.75	1.9	10.42

Notes:
TOC = top of casing
ft btoc= feet below top of casing
ft msl = feet above mean sea level
ft bgs = feet below ground surface

REFERENCE: METRO AREAS OF ALAMEDA, CONTRA COSTA, MARIN, SAN FRANCISCO, SAN MATEO, AND SANTA CLARA COUNTIES, THOMAS GUIDE, 2008.

N

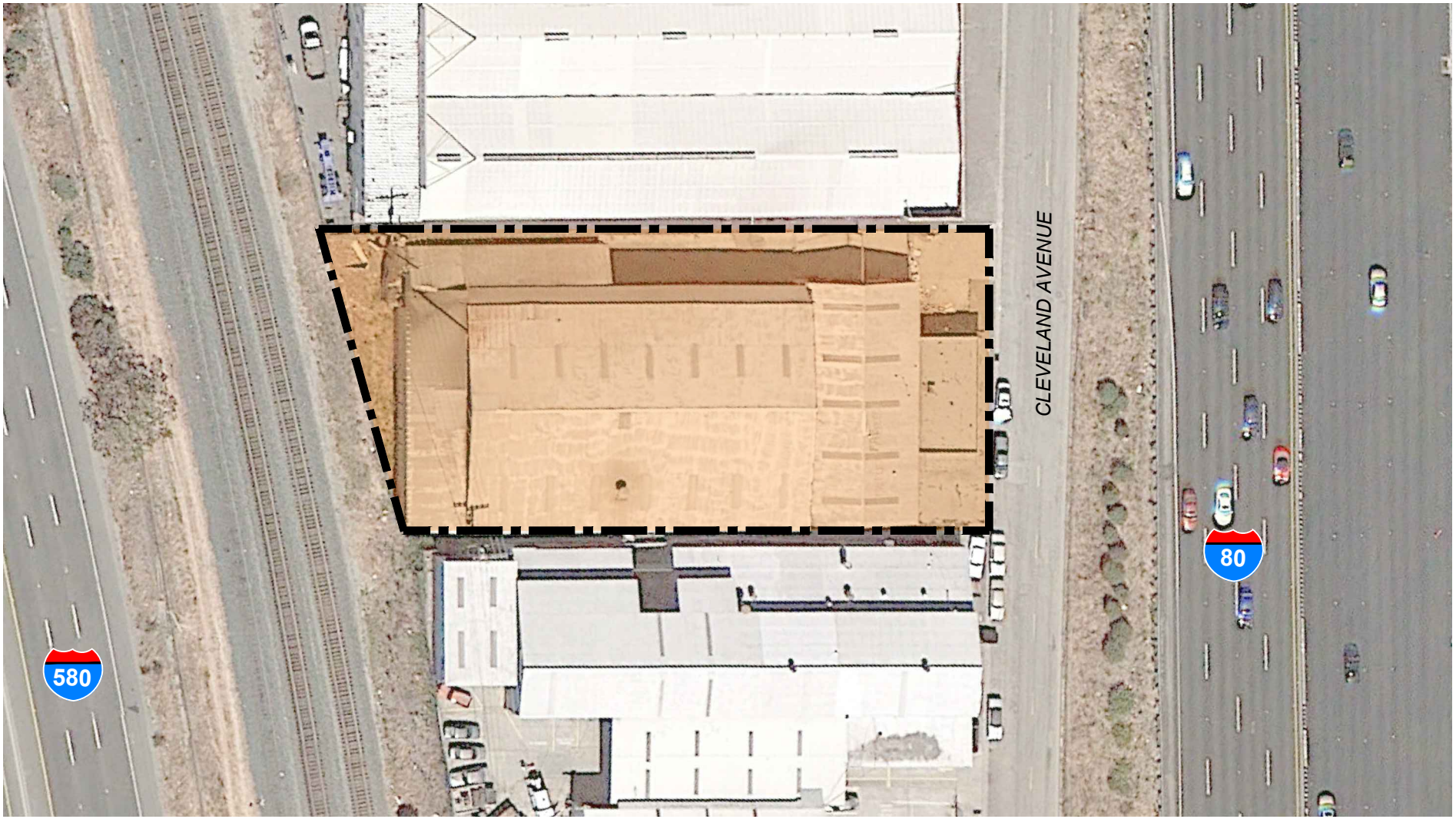
SCALE IN FEET

0 2,000 4,000

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore	SITE LOCATION	FIGURE
PROJECT NO. 401823001 / DATE 4/14	WESTERN FORGE & FLANGE 540 CLEVELAND AVENUE ALBANY, CALIFORNIA	1

401823001-SL.dwg, Apr 04, 2014, 9:32am,snguyen



REFERENCE: GOOGLE EARTH IMAGERY, 2013.

LEGEND

SITE BOUNDARY

N

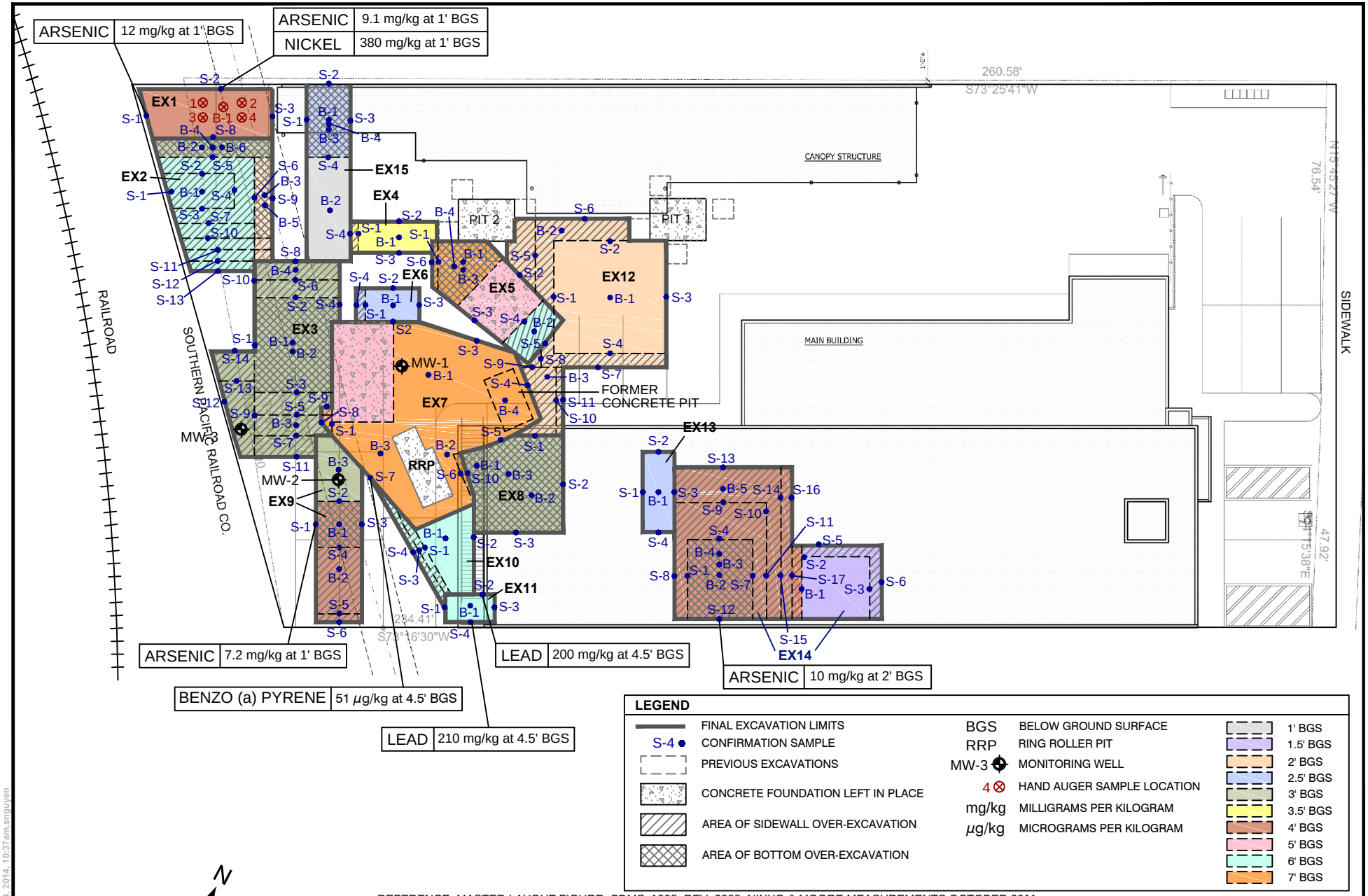
SCALE IN FEET

0 60 120

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore		SITE VICINITY	FIGURE
PROJECT NO.	DATE	WESTERN FORGE & FLANGE 540 CLEVELAND AVENUE ALBANY, CALIFORNIA	2
401823001	4/14		

401823001-FIG2.dwg, Apr 04, 2014, 9:38am,snguyen

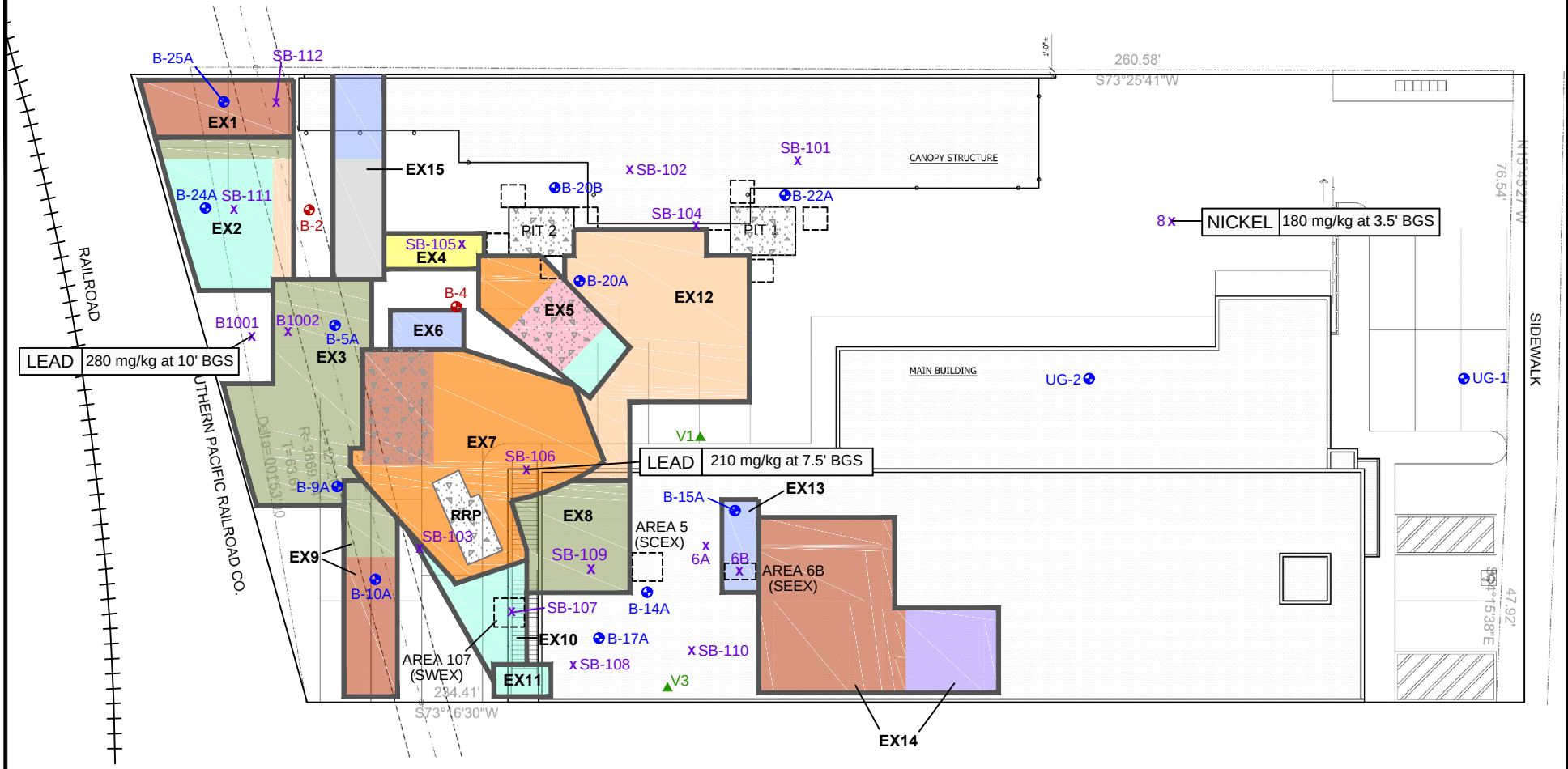


NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

REFERENCE: MASTER LAYOUT FIGURE, CDMS, 1998, REV. 2008, NINYO & MOORE MEASUREMENTS OCTOBER 2011, SITE PLAN BY GILLIS + PANICHAPAN ARCHITECTS, INC. SHEET A1.1, MARCH 2014.

Ninyo & Moore	EXCAVATION AREAS, MONITORING WELL AND SAMPLE LOCATIONS, REMAINING CONCENTRATION EXCEEDING CLEANUP GOALS, AND PROPOSED DEVELOPMENT PLAN	FIGURE
PROJECT NO. 401823001 / DATE 4/14	WESTERN FORGE & FLANGE 540 CLEVELAND AVENUE ALBANY, CALIFORNIA	3

401823001-FIG3-SMP.dwg, Apr 04, 2014, 10:37am,snguyen



LEGEND

- FINAL EXCAVATION LIMITS
- ▲ BROWN + CALDWELL VERIFICATION SAMPLE LOCATION (MARCH 1985)
- X CHEMICAL DATA MANAGEMENT SYSTEMS (CDMS) SAMPLE LOCATION (OCTOBER AND NOVEMBER 2008 AND OCTOBER 2010)
- B-4 NINYO & MOORE BORING LOCATION (APRIL 2012)
- B-25A NINYO & MOORE BORING LOCATION (DECEMBER 2012)
- EXCAVATIONS FROM THE 2009 CDMS REMEDIAL ACTIVITIES
- CONCRETE FOUNDATION LEFT IN PLACE
- BGS BELOW GROUND SURFACE
- RRP RING ROLLER PIT
- mg/kg MILLIGRAMS PER KILOGRAM

1' BGS, 1.5' BGS, 2' BGS, 2.5' BGS, 3' BGS, 3.5' BGS, 4' BGS, 5' BGS, 6' BGS, 7' BGS

REFERENCE: MASTER LAYOUT FIGURE, CDMS, 1998, REV. 2008, NINYO & MOORE MEASUREMENTS OCTOBER 2011, SITE PLAN BY GILLIS + PANICHAPAN ARCHITECTS, INC. SHEET A1.1, MARCH 2014.

SCALE IN FEET

0 30 60

NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE.

Ninyo & Moore

REMAINING PREVIOUS SAMPLE LOCATIONS USED IN 95% UCL CALCULATIONS, REMAINING CONCENTRATION EXCEEDING CLEANUP GOALS, AND PROPOSED DEVELOPMENT PLAN

PROJECT NO.	DATE
401823001	4/14

WESTERN FORGE & FLANGE
540 CLEVELAND AVENUE
ALBANY, CALIFORNIA

FIGURE
4

401823001-FIG4-SMP.dwg, Apr 04, 2014, 10:39am,snguyen

APPENDIX A

95% UCL CALCULATIONS

TABLE A-1 - 95 % UCL CALCULATION FOR ARSENIC IN SOIL

Sample ID	Analytical Result (mg/kg)
Confirmation Samples	
EX1-B-1-4.0	6.1
EX1-S-1-1.0	**12**
EX1-S-2-1.0	**9.1**
EX1-S-3-1.0	4.3
EX5-B-2-6.0*	1.95
EX5-S-2-2.5	3.6
EX5-S-3-2.5*	2
EX5-S-5-2.5*	1.9
EX7-B-1-7.0*	1.9
EX7-B-2-7.0*	1.55
EX7-B-3-7.0*	1.85
EX7-B-4-7.0	4.4
EX7-S-2-5.5	6.3
EX7-S-3-5.5*	1.85
EX7-S-4-5.5*	1.8
EX7-S-5-5.5	5.5
EX7-S-7-4.5	4.5
EX7-S-8-5.0*	1.85
EX7-S-9-5.0*	2
EX7-S-10-5.5*	1.75
EX9-B-2-4.0*	1.9
EX9-B-3-3.0*	2
EX9-S-1-1.0	**7.2**
EX9-S-2-1.0	6.2
EX9-S-3-1.0	5.1
EX14-B-1-1.5	3.9
EX14-B-4-4.0*	2
EX14-S-6-0.5	4.8
EX14-S-12-2.0	**10**
EX15-B-2-1.0*	1.9
Previous Samples	
B-2 @ 0.5	3.9
B-4 @ 5.0*	1.6
B-5A @ 4-5*	1.9
B-9A @ 7-8	4.8
B-15A @ 4-5*	1.85
B-20B @ 1-2	4.4
B-22A @ 4-5*	1.9
UG-1 @ 0.5-1	4.9
UG-2 @ 0.5-1	3.6

ProUCL Calculations

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	39.00	Shapiro-Wilk Test Statisitic	0.81
Number of Unique Samples	24.00	Shapiro-Wilk 5% Critical Value	0.94
Minimum	1.55	Data not normal at 5% significance level	
Maximum	12.00		
Mean	3.85	95% UCL (Assuming Normal Distribution)	
Median	3.60	Student's-t UCL	4.53
Standard Deviation	2.53		
Variance	6.40	Gamma Distribution Test	
Coefficient of Variation	0.66	A-D Test Statistic	2.15
Skewness	1.47	A-D 5% Critical Value	0.75
		K-S Test Statistic	0.28
Gamma Statistics		K-S 5% Critical Value	0.14
k hat	2.93	Data do not follow gamma distribution	
k star (bias corrected)	2.72	at 5% significance level	
Theta hat	1.31		
Theta star	1.41	95% UCLs (Assuming Gamma Distribution)	
nu hat	228.61	Approximate Gamma UCL	4.55
nu star	212.35	Adjusted Gamma UCL	4.58
Approx.Chi Square Value (.05)	179.62		
Adjusted Level of Significance	0.04	Lognormal Distribution Test	
Adjusted Chi Square Value	178.44	Shapiro-Wilk Test Statisitic	0.86
		Shapiro-Wilk 5% Critical Value	0.94
Log-transformed Statistics		Data not lognormal at 5% significance level	
Minimum of log data	0.44		
Maximum of log data	2.48	95% UCLs (Assuming Lognormal Distribution)	
Mean of log data	1.17	95% H-UCL	4.63
Standard Deviation of log data	0.59	95% Chebyshev (MVUE) UCL	5.48
Variance of log data	0.35	97.5% Chebyshev (MVUE) UCL	6.21
		99% Chebyshev (MVUE) UCL	7.63
		95% Non-parametric UCLs	
		CLT UCL	4.51
		Adj-CLT UCL (Adjusted for skewness)	4.62
		Mod-t UCL (Adjusted for skewness)	4.55
		Jackknife UCL	4.53
		Standard Bootstrap UCL	4.51
		Bootstrap-t UCL	4.72
RECOMMENDATION		Hall's Bootstrap UCL	4.61
Data are Non-parametric (0.05)		Percentile Bootstrap UCL	4.56
		BCA Bootstrap UCL	4.62
Use 95% Chebyshev (Mean, Sd) UCL		95% Chebyshev (Mean, Sd) UCL	5.61
		97.5% Chebyshev (Mean, Sd) UCL	6.38
		99% Chebyshev (Mean, Sd) UCL	7.88

Notes:
bold indicates a concentration equal to or exceeding 7 mg/kg
*indicates laboratory result was non-detectable, therefore half the reporting limit was used for the statistical analysis
mg/kg – milligrams per kilogram

TABLE A-2 - 95 % UCL CALCULATION FOR LEAD IN SOIL

Sample ID	Analytical Result (mg/kg)	Sample ID	Analytical Result (mg/kg)
Confirmation Samples		**Previous Samples**	
EX1-B-1-4.0	16	SB-101 (11.5)	4
EX1-S-1-1.0	16	SB-101 (15.5)	6
EX1-S-2-1.0	26	SB-102 (3.5)	15
EX1-S-3-1.0	3.3	SB-102 (7.5)	110
EX2-B-1-6.0	71	SB-102 (11.5)	5
EX2-S-1-4.5	11	SB-102 (15.5)	7
EX2-S-4-4.5	18	SB-103 (7.5)	150
EX5-B-2-6.0	6.4	SB-103 (11.5)	4
EX5-S-2-2.5	68	SB-103 (15.5)	4
EX5-S-3-2.5	44	SB-104 (1.5)	10
EX5-S-5-2.5	5.1	SB-104 (3.5)	75
EX7-B-4-7.0	12	SB-104 (7.5)	13
EX7-S-2-5.5	120	SB-105 (3.5)	44
EX7-S-4-5.5	150	SB-105 (7.5)	17
EX7-S-5-5.5	160	SB-106 (7.5)	**210**
EX9-B-3-3.0	46	SB-108 (1.5)	12
EX11-B-1-6.0	10	SB-108 (4.5)	65
EX11-S-1-4.5	43	SB-108 (7.5)	5
EX11-S-2-4.5	**200**	SB-109 (4.5)	120
EX11-S-3-4.5	170	SB-109 (7.5)	5
EX11-S-4-4.5	**210**	SB-110 (1.5)	87
EX13-B-1-2.5	52	SB-110 (4.5)	10
EX13-S-1-1.0	43	SB-110 (7.5)	5
EX13-S-2-1.0	140	SB-111 (7.5)	49
EX13-S-3-1.0	16	SB-111 (9.5)	10
EX13-S-4-1.0	33	SB-112 (7.5)	8
EX14-B-1-1.5	150	#6A (2.75)	110
EX14-B-4-4.0	5.8	#6A (3.5)	7
EX14-B-5-4.0	45	#6B (3.75)	56
EX14-S-5-0.5	150	#8 (1.25)	180
EX14-S-6-0.5	180	#8 (3.5)	140
EX14-S-12-2.0	150	B1001 (0.5)	76
EX14-S-13-0.5	110	B1001 (2.0)	48
EX14-S-16-0.5	170	B1001 (4.0)	11
EX15-B-2-1.0	71	B1001 (6.0)	43
Previous Samples		B1001 (8.0)	41
B-2 @ 0.5	160	B1001 (10.0)	**280**
B-4 @ 5.0	48	B1002 (4.0)	9.5
B-5A @ 4-5	60	B1002 (10.0)	26
B-9A @ 7-8	170	SWEX- East Wall	21
B-15A @ 4-5	50	SCEX - Bottom	26
B-22A @ 4-5	67	SCEX- North Wall	54
B25A-4.0	19	SCEX- East Wall	8
V1 (1.5-2.0)	17	SCEX- South Wall	6
V3 (1.0-1.5)	14	SEEX - Bottom	38
SB-101 (3.5)	12	SEEX- West Wall	4
SB-101 (7.5)	5		

ProUCL Calculations

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	92.00	Lilliefors Test Statisitic	0.19
Number of Unique Samples	53.00	Lilliefors 5% Critical Value	0.09
Minimum	3.30	Data not normal at 5% significance level	
Maximum	280.00		
Mean	60.63	95% UCL (Assuming Normal Distribution)	
Median	42.00	Student's-t UCL	71.78
Standard Deviation	64.35		
Variance	4140.36	Gamma Distribution Test	
Coefficient of Variation	1.06	A-D Test Statistic	1.89
Skewness	1.22	A-D 5% Critical Value	0.79
		K-S Test Statistic	0.13
Gamma Statistics		K-S 5% Critical Value	0.10
k hat	0.87	Data do not follow gamma distribution	
k star (bias corrected)	0.85	at 5% significance level	
Theta hat	69.96		
Theta star	71.70	95% UCLs (Assuming Gamma Distribution)	
nu hat	159.46	Approximate Gamma UCL	73.84
nu star	155.60	Adjusted Gamma UCL	74.08
Approx.Chi Square Value (.05)	127.76		
Adjusted Level of Significance	0.05	Lognormal Distribution Test	
Adjusted Chi Square Value	127.36	Lilliefors Test Statisitic	0.10
		Lilliefors 5% Critical Value	0.09
Log-transformed Statistics		Data not lognormal at 5% significance level	
Minimum of log data	1.19		
Maximum of log data	5.63	95% UCLs (Assuming Lognormal Distribution)	
Mean of log data	3.43	95% H-UCL	96.06
Standard Deviation of log data	1.27	95% Chebyshev (MVUE) UCL	118.70
Variance of log data	1.61	97.5% Chebyshev (MVUE) UCL	140.67
		99% Chebyshev (MVUE) UCL	183.81
		95% Non-parametric UCLs	
		CLT UCL	71.67
		Adj-CLT UCL (Adjusted for skewness)	72.58
		Mod-t UCL (Adjusted for skewness)	71.92
		Jackknife UCL	71.78
		Standard Bootstrap UCL	71.65
		Bootstrap-t UCL	72.49
RECOMMENDATION		Hall's Bootstrap UCL	72.86
Data are Non-parametric (0.05)		Percentile Bootstrap UCL	71.61
		BCA Bootstrap UCL	72.76
Use 97.5% Chebyshev (Mean, Sd) UCL		95% Chebyshev (Mean, Sd) UCL	89.87
		97.5% Chebyshev (Mean, Sd) UCL	102.53
		99% Chebyshev (Mean, Sd) UCL	127.38

Notes:
bold indicates a concentration equal to or exceeding 200 mg/kg
mg/kg – milligrams per kilogram

TABLE A-3 - 95 % UCL CALCULATION FOR NICKEL IN SOIL

Sample ID	Analytical Result mg/kg	Sample ID	Analytical Result mg/kg	Sample ID	Analytical Result mg/kg
Confirmation Samples		EX9-B-3-3.0	15	SB-108 (4.5)	24
EX1-B-1-4.0	77	EX9-S-1-1.0	110	SB-108 (7.5)	10
EX1-S-1-1.0	39	EX9-S-2-1.0	140	SB-109 (4.5)	14
EX1-S-2-1.0	**380**	EX9-S-3-1.0	32	SB-109 (7.5)	10
EX1-S-3-1.0	24	EX9-S-6-1.0	82	SB-110 (1.5)	19
EX2-B-1-6.0	55	EX12-B-1-2.0	84	SB-110 (4.5)	11
EX2-B-5-2.0	110	EX12-B-2-2.0	91	SB-110 (7.5)	8.4
EX2-B-6-3.0	67	EX12-B-3-2.0	13	SB-111 (7.5)	12
EX2-S-1-0.5	100	EX12-S-3-1.0	110	SB-111 (9.5)	9
EX2-S-1-4.5	16	EX12-S-6-1.0	12	SB-112 (7.5)	86
EX2-S-4-4.5	40	EX12-S-7-1.0	7.6	#6A (2.75)	97
EX2-S-5-4.5	86	EX12-S-11-1.0	38	#6A (3.5)	8.3
EX2-S-8-0.5	78	EX14-B-1-1.5	61	#6B (3.75)	9.2
EX2-S-9-0.5	15	EX14-S-6-0.5	12	#8 (1.25)	14
EX2-S-13-4.5	79	EX14-S-8-0.5	11	#8 (3.5)	**180**
EX3-B-2-3.0	36	EX15-B-2-1.0	21	B1001 (0.5)	23
EX3-B-3-3.0	97	**Previous Samples**		B1001 (2.0)	83
EX3-S-1-1.0	57	B-4 @ 5.0	7.1	B1001 (4.0)	15
EX3-S-4-1.0	84	B-5A @ 4-5	13	B1001 (6.0)	84
EX3-S-11-1.0	43	B-9A @ 7-8	23	B1001 (8.0)	16
EX3-S-12-1.0	44	B-15A @ 4-5	12	B1001 (10.0)	25
EX3-S-14-1.0	42	B-22A @ 4-5	19	B1002 (4.0)	69
EX4-B-1-3.5	110	B25A-4.0	84	B1002 (10.0)	9.1
EX4-S-2-1.5	100	V1 (1.5-2.0)	15		
EX4-S-3-1.5	110	V3 (1.0-1.5)	95		
EX4-S-4-1.5	38	SB-101 (3.5)	22		
EX5-B-2-6.0	9.8	SB-101 (7.5)	8.2		
EX5-S-2-2.5	33	SB-101 (11.5)	10		
EX5-S-3-2.5	16	SB-101 (15.5)	20		
EX5-S-5-2.5	12	SB-102 (3.5)	60		
EX6-B-1-2.5	46	SB-102 (7.5)	7.8		
EX6-S-2-1.5	76	SB-102 (11.5)	9.4		
EX6-S-3-1.5	37	SB-102 (15.5)	15		
EX6-S-4-1.5	91	SB-103 (7.5)	10		
EX7-B-1-7.0	13	SB-103 (11.5)	23		
EX7-B-2-7.0	11	SB-103 (15.5)	23		
EX7-B-3-7.0	29	SB-104 (1.5)	35		
EX7-B-4-7.0	14	SB-104 (3.5)	11		
EX7-S-2-5.5	41	SB-104 (7.5)	8.3		
EX7-S-3-5.5	9.9	SB-105 (3.5)	12		
EX7-S-4-5.5	15	SB-105 (7.5)	10		
EX7-S-5-5.5	16	SB-106 (7.5)	24		
EX7-S-7-4.5	52	SB-107 (7.5)	11		
EX9-B-2-4.0	14	SB-108 (1.5)	59		

ProUCL Calculations

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	109.00	Lilliefors Test Statisitic	0.22
Number of Unique Samples	64.00	Lilliefors 5% Critical Value	0.08
Minimum	7.10	Data not normal at 5% significance level	
Maximum	380.00		
Mean	43.90	95% UCL (Assuming Normal Distribution)	
Median	23.00	Student's-t UCL	51.64
Standard Deviation	48.71		
Variance	2372.71	Gamma Distribution Test	
Coefficient of Variation	1.11	A-D Test Statistic	3.64
Skewness	3.50	A-D 5% Critical Value	0.78
		K-S Test Statistic	0.17
Gamma Statistics		K-S 5% Critical Value	0.09
k hat	1.27	Data do not follow gamma distribution	
k star (bias corrected)	1.24	at 5% significance level	
Theta hat	34.62		
Theta star	35.42	95% UCLs (Assuming Gamma Distribution)	
nu hat	276.47	Approximate Gamma UCL	50.88
nu star	270.20	Adjusted Gamma UCL	50.98
Approx.Chi Square Value (.05)	233.12		
Adjusted Level of Significance	0.05	Lognormal Distribution Test	
Adjusted Chi Square Value	232.66	Lilliefors Test Statisitic	0.15
		Lilliefors 5% Critical Value	0.08
Log-transformed Statistics		Data not lognormal at 5% significance level	
Minimum of log data	1.96		
Maximum of log data	5.94	95% UCLs (Assuming Lognormal Distribution)	
Mean of log data	3.34	95% H-UCL	52.51
Standard Deviation of log data	0.93	95% Chebyshev (MVUE) UCL	62.84
Variance of log data	0.86	97.5% Chebyshev (MVUE) UCL	71.36
		99% Chebyshev (MVUE) UCL	88.10
		95% Non-parametric UCLs	
		CLT UCL	51.57
		Adj-CLT UCL (Adjusted for skewness)	53.24
		Mod-t UCL (Adjusted for skewness)	51.90
		Jackknife UCL	51.64
		Standard Bootstrap UCL	51.39
		Bootstrap-t UCL	53.89
RECOMMENDATION		Hall's Bootstrap UCL	56.24
Data are Non-parametric (0.05)		Percentile Bootstrap UCL	51.18
		BCA Bootstrap UCL	52.89
Use 95% Chebyshev (Mean, Sd) UCL		95% Chebyshev (Mean, Sd) UCL	64.24
		97.5% Chebyshev (Mean, Sd) UCL	73.04
		99% Chebyshev (Mean, Sd) UCL	90.32

Notes:
bold indicates a concentration equal to or exceeding 150 mg/kg
mg/kg – milligrams per kilogram

TABLE A-4 - 95 % UCL CALCULATION FOR BENZO(a)PYRENE IN SOIL

Sample ID	Analytical Results (µg/kg)
Confirmation Sample Results	
EX5-B-2-6.0*	2.45
EX5-B-4-7.0*	2.5
EX5-S-2-2.5	31
EX5-S-3-2.5	14
EX5-S-5-2.5*	2.5
EX5-S-6-2.5	9.9
EX7-B-1-7.0*	2.5
EX7-B-2-7.0*	2.5
EX7-B-3-7.0*	2.45
EX7-B-4-7.0*	2.5
EX7-S-2-5.5*	2.5
EX7-S-3-5.5*	2.5
EX7-S-4-5.5	29
EX7-S-5-5.5*	25
EX7-S-7-4.5	**51**
EX7-S-10-5.5*	2.45
EX8-B-3-3.0*	2.45
EX8-S-1-1.0	11
EX8-S-2-1.0	10
EX8-S-3-1.0	23
EX9-B-3-3.0	33
EX10-B-1-6.0*	2.5
EX10-S-2-4.5	13
EX10-S-4-4.5	15
EX15-B-2-1.0	65
Previous Sample Results	
B-10A @ 6-7	32
B-14A @ 4-5	12
B-15A @ 4-5	5.2
B-15A @ 6-7*	2.5
B-17A @ 4-5	41
B17A @ 6-7*	2.5
B-20A @ 4-5	15
B-22A @ 4-5	33
B-22A @ 6-7	41
B-24A @ 6-7	6

ProUCL Calculations

Raw Statistics		Normal Distribution Test	
Number of Valid Samples	35.00	Shapiro-Wilk Test Statisitic	0.80
Number of Unique Samples	20.00	Shapiro-Wilk 5% Critical Value	0.93
Minimum	2.45	Data not normal at 5% significance level	
Maximum	65.00		
Mean	15.71	95% UCL (Assuming Normal Distribution)	
Median	10.00	Student's-t UCL	20.40
Standard Deviation	16.39		
Variance	268.64	Gamma Distribution Test	
Coefficient of Variation	1.04	A-D Test Statistic	1.86
Skewness	1.29	A-D 5% Critical Value	0.78
		K-S Test Statistic	0.25
Gamma Statistics		K-S 5% Critical Value	0.15
k hat	0.97	Data do not follow gamma distribution	
k star (bias corrected)	0.90	at 5% significance level	
Theta hat	16.24		
Theta star	17.39	95% UCLs (Assuming Gamma Distribution)	
nu hat	67.70	Approximate Gamma UCL	21.63
nu star	63.23	Adjusted Gamma UCL	21.96
Approx.Chi Square Value (.05)	45.94		
Adjusted Level of Significance	0.04	Lognormal Distribution Test	
Adjusted Chi Square Value	45.24	Shapiro-Wilk Test Statisitic	0.84
		Shapiro-Wilk 5% Critical Value	0.93
Log-transformed Statistics		Data not lognormal at 5% significance level	
Minimum of log data	0.90		
Maximum of log data	4.17	95% UCLs (Assuming Lognormal Distribution)	
Mean of log data	2.16	95% H-UCL	28.42
Standard Deviation of log data	1.16	95% Chebyshev (MVUE) UCL	33.32
Variance of log data	1.35	97.5% Chebyshev (MVUE) UCL	40.63
		99% Chebyshev (MVUE) UCL	54.98
		95% Non-parametric UCLs	
		CLT UCL	20.27
		Adj-CLT UCL (Adjusted for skewness)	20.92
		Mod-t UCL (Adjusted for skewness)	20.50
		Jackknife UCL	20.40
		Standard Bootstrap UCL	20.30
		Bootstrap-t UCL	21.28
RECOMMENDATION		Hall's Bootstrap UCL	20.99
Data are Non-parametric (0.05)		Percentile Bootstrap UCL	20.34
		BCA Bootstrap UCL	20.81
Use 99% Chebyshev (Mean, Sd) UCL		95% Chebyshev (Mean, Sd) UCL	27.79
		97.5% Chebyshev (Mean, Sd) UCL	33.01
		99% Chebyshev (Mean, Sd) UCL	43.28

Notes:
Bold indicates a concentration exceeding 45 µg/kg
*indicates laboratory result was non-detectable, therefore half the reporting limit was used for the statistical analysis
µg/kg – micrograms per kilogram

APPENDIX B

DTSC INFORMATION ADVISORY FOR CLEAN IMPORTED FILL MATERIAL

Information Advisory
Clean Imported Fill Material

October 2001

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

It is DTSC's mission to restore, protect and enhance the environment, to ensure public health, environmental quality and economic vitality, by regulating hazardous waste, conducting and overseeing cleanups, and developing and promoting pollution prevention.

State of California

California Environmental Protection Agency

Executive Summary

This fact sheet has been prepared to ensure that inappropriate fill material is not introduced onto sensitive land use properties under the oversight of the DTSC or applicable regulatory authorities. Sensitive land use properties include those that contain facilities such as hospitals, homes, day care centers, and schools. This document only focuses on human health concerns and ecological issues are not addressed. It identifies those types of land use activities that may be appropriate when determining whether a site may be used as a fill material source area. It also provides guidelines for the appropriate types of analyses that should be performed relative to the former land use, and for the number of samples that should be collected and analyzed based on the estimated volume of fill material that will need to be used. The information provided in this fact sheet is not regulatory in nature, rather is to be used as a guide, and in most situations the final decision as to the acceptability of fill material for a sensitive land use property is made on a case-by-case basis by the appropriate regulatory agency.

Introduction

The use of imported fill material has recently come under scrutiny because of the instances where contaminated soil has been brought onto an otherwise clean site. However, there are currently no established standards in the statutes or regulations that address environmental requirements for imported fill material. Therefore, the California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) has prepared this fact sheet to identify procedures that can be used to minimize the possibility of introducing contaminated soil onto a site that requires imported fill material. Such sites include those that are undergoing site remediation, corrective action, and closure activities overseen by DTSC or the appropriate regulatory agency. These procedures may also apply to construction projects that will result in sensitive land uses. The intent of this fact sheet is to protect people who live on or otherwise use a sensitive land use property. By using this fact sheet as a guide, the reader will minimize the chance of introducing fill material that may result in potential risk to human health or the environment at some future time.

Overview

Both natural and manmade fill materials are used for a variety of purposes. Fill material properties are commonly controlled to meet the necessary site specific engineering specifications. Because most sites requiring fill material are located in or near urban areas, the fill materials are often obtained from construction projects that generate an excess of soil, and from demolition debris (asphalt, broken concrete, etc.). However, materials from those types of sites may or may not be appropriate, depending on the proposed use of the fill, and the quality of the assessment and/or mitigation measures, if necessary. Therefore, unless material from construction projects can be demonstrated to be free of contamination and/or appropriate for the proposed use, the use of that material as fill should be avoided.

Selecting Fill Material

In general, the fill source area should be located in nonindustrial areas, and not from sites undergoing an environmental cleanup. Nonindustrial sites include those that were previously undeveloped, or used solely for residential or agricultural purposes. If the source is from an agricultural area, care should be taken to insure that the fill does not include former agricultural waste process byproducts such as manure or other decomposed organic material. Undesirable sources of fill material include industrial and/or commercial sites where hazardous ma-

Potential Contaminants Based on the Fill Source Area

Fill Source:	Target Compounds
Land near to an existing freeway	Lead (EPA methods 6010B or 7471A), PAHs (EPA method 8310)
Land near a mining area or rock quarry	Heavy Metals (EPA methods 6010B and 7471A), asbestos (polarized light microscopy), pH
Agricultural land	Pesticides (Organochlorine Pesticides: EPA method 8081A or 8080A; Organophosphorus Pesticides: EPA method 8141A; Chlorinated Herbicides: EPA method 8151A), heavy metals (EPA methods 6010B and 7471A)
Residential/acceptable commercial land	VOCs (EPA method 8021 or 8260B, as appropriate and combined with collection by EPA Method 5035), semi-VOCs (EPA method 8270C), TPH (modified EPA method 8015), PCBs (EPA method 8082 or 8080A), heavy metals including lead (EPA methods 6010B and 7471A), asbestos (OSHA Method ID-191)

**The recommended analyses should be performed in accordance with USEPA SW-846 methods (1996). Other possible analyses include Hexavalent Chromium: EPA method 7199*

Recommended Fill Material Sampling Schedule

Area of Individual Borrow Area	Sampling Requirements
2 acres or less	Minimum of 4 samples
2 to 4 acres	Minimum of 1 sample every 1/2 acre
4 to 10 acres	Minimum of 8 samples
Greater than 10 acres	Minimum of 8 locations with 4 subsamples per location

Volume of Borrow Area Stockpile	Samples per Volume
Up to 1,000 cubic yards	1 sample per 250 cubic yards
1,000 to 5,000 cubic yards	4 samples for first 1000 cubic yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 cubic yards	12 samples for first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

terials were used, handled or stored as part of the business operations, or unpaved parking areas where petroleum hydrocarbons could have been spilled or leaked into the soil. Undesirable commercial sites include former gasoline service stations, retail strip malls that contained dry cleaners or photographic processing facilities, paint stores, auto repair and/or painting facilities. Undesirable industrial facilities include metal processing shops, manufacturing facilities, aerospace facilities, oil refineries, waste treatment plants, etc. Alternatives to using fill from construction sites include the use of fill material obtained from a commercial supplier of fill material or from soil pits in rural or suburban areas. However, care should be taken to ensure that those materials are also uncontaminated.

Documentation and Analysis

In order to minimize the potential of introducing contaminated fill material onto a site, it is necessary to verify through documentation that the fill source is appropriate and/or to have the fill material analyzed for potential contaminants based on the location and history of the source area. Fill documentation should include detailed information on the previous use of the land from where the fill is taken, whether an environmental site assessment was performed and its findings, and the results of any testing performed. It is recommended that any such documentation should be signed by an appropriately licensed (CA-registered) individual. If such documentation is not available or is inadequate, samples of the fill material should be chemically analyzed. Analysis of the fill material should be based on the source of the fill and knowledge of the prior land use.

Detectable amounts of compounds of concern within the fill material should be evaluated for risk in accordance with the DTSC Preliminary Endangerment Assessment (PEA) Guidance Manual. If

metal analyses are performed, only those metals (CAM 17 / Title 22) to which risk levels have been assigned need to be evaluated. At present, the DTSC is working to establish California Screening Levels (CSL) to determine whether some compounds of concern pose a risk. Until such time as these CSL values are established, DTSC recommends that the DTSC PEA Guidance Manual or an equivalent process be referenced. This guidance may include the Regional Water Quality Control Board's (RWQCB) guidelines for reuse of non-hazardous petroleum hydrocarbon contaminated soil as applied to Total Petroleum Hydrocarbons (TPH) only. The RWQCB guidelines should not be used for volatile organic compounds (VOCs) or semi-volatile organic compounds (SVOCS). In addition, a standard laboratory data package, including a summary of the QA/QC (Quality Assurance/Quality Control) sample results should also accompany all analytical reports.

When possible, representative samples should be collected at the borrow area while the potential fill material is still in place, and analyzed prior to removal from the borrow area. In addition to performing the appropriate analyses of the fill material, an appropriate number of samples should also be determined based on the approximate volume or area of soil to be used as fill material. The table above can be used as a guide to determine the number of samples needed to adequately characterize the fill material when sampled at the borrow site.

Alternative Sampling

A Phase I or PEA may be conducted prior to sampling to determine whether the borrow area may have been impacted by previous activities on the property. After the property has been evaluated, any sampling that may be required can be determined during a meeting with DTSC or appropriate regulatory agency. However, if it is not possible to analyze the fill material at the borrow area or determine that it is appropriate for use via a Phase I or PEA, it is recommended that one (1) sample per truckload be collected and analyzed for all compounds of concern to ensure that the imported soil is uncontaminated and acceptable. (See chart on Potential Contaminants Based on the Fill Source Area for appropriate analyses). This sampling frequency may be modified upon consultation with the DTSC or appropriate regulatory agency if all of the fill material is derived from a common borrow area. However, fill material that is not characterized at the borrow area will need to be stockpiled either on or off-site until the analyses have been completed. In addition, should contaminants exceeding acceptance criteria be identified in the stockpiled fill material, that material will be deemed unacceptable and new fill material will need to be obtained, sampled and analyzed. Therefore, the DTSC recommends that all sampling and analyses should be completed prior to delivery to the site to ensure the soil is free of contamination, and to eliminate unnecessary transportation charges for unacceptable fill material.

Composite sampling for fill material characterization may or may not be appropriate, depending on quality and homogeneity of source/borrow area, and compounds of concern. Compositing samples for volatile and semivolatile constituents is not acceptable. Composite sampling for heavy metals, pesticides, herbicides or PAH's from unanalyzed stockpiled soil is also unacceptable, unless it is stockpiled at the borrow area and originates from the same source area. In addition, if samples are composited, they should be from the same soil layer, and not from different soil layers.

When very large volumes of fill material are anticipated, or when larger areas are being considered as borrow areas, the DTSC recommends that a Phase I or PEA be conducted on the area to ensure that the borrow area has not been impacted by previous activities on the property. After the property has been evaluated, any sampling that may be required can be determined during a meeting with the DTSC.

For further information, call Richard Coffman, Ph.D., R.G., at (818) 551-2175.