Kasey Cordoza
510-886-5399
1 sheet, please inform of reciept

September 1, 2015

Ms. Karel Detterman
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

I, Bob Winet, hereby authorize ERAS Environmental, Inc. to submit the Workplan for Limited Phase II Subsurface Investigation for 1091 Calcot Place, Oakland, California, dated August 31, 2015 to the Alameda County Health Care Services Agency.

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

Signature: Bob Winet

Printed Name: Bob Winet

Mr. Bob Winet
East Bay Lofts LLC
36966 Pinto Palm Street
Rancho Mirage, CA 92270
bwinet3@verizon.net

ERAS Environmental, Inc.

1533 B Street

Hayward, CA 94541

Phone (510) 247-9885 Facsimile: (510) 886-5399

info@eras.biz

WORK PLAN FOR LIMITED PHASE II SUBSURFACE INVESTIGATION

AT

1091 Calcot Place
Oakland, California

ERAS PROJECT NUMBER: 14229C

Prepared for

Mr. Bob Winet
East Bay Lofts LLC
36966 Pinto Palm Street
Rancho Mirage, CA 92270

August 31, 2015

Table of Contents

CERTIFICATION

This **Work Plan for Limited Phase II Subsurface Investigation** at 1019 Calcot Place in Oakland, California, has been prepared by ERAS Environmental, Inc. (ERAS) under the professional supervision of the Registered Professional Geologist whose signature appears hereon.

This work plan was prepared in general accordance with the accepted standard of practice that exists in Northern California at the time the investigation was performed. Judgments leading to conclusions and recommendations are generally made with an incomplete knowledge of the conditions present. More extensive studies, including additional environmental investigations, can tend to reduce the inherent uncertainties associated with such studies.

Our firm has prepared this work plan for the Client's exclusive use for this particular project and in accordance with generally accepted professional practices within the area at the time of our investigation. No other representations, expressed or implied, and no warranty or guarantee is included or intended.

This work plan may be used only by the client and only for the purposes stated within a reasonable time from its issuance. Land use, site conditions (both on-site and off-site) or other factors may change over time, and additional work may be required with the passage of time. Any party other than the client who wishes to use this report shall notify ERAS of such intended use. Based on the intended use of report, ERAS may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release ERAS from any liability resulting from the use of this report by any unauthorized party.

Sincerely,
ERAS Environmental, Inc.

Curtis Payton
California Registered Professional Geologist 5608

Andrew Savage
Project Geologist

August 31, 2015

1.0 INTRODUCTION

The following is a work plan for the collection of soil and groundwater samples to define the lateral and vertical extent of contamination at a commercial site located at 1091 Calcot Place in Oakland, California (the "Property").

A previous subsurface investigation conducted by ERAS on the Property identified contamination including elevated concentrations of petroleum hydrocarbons quantified as diesel and oil range organics (TPH-dro[1], and TPH-oro).

This work plan was prepared to further investigate contamination near the former fuel oil underground storage tanks (USTs) so that an environmental site case closure can be obtained from the Alameda County Environmental Health Care Services Agency (ACHCSA).

The Property is located on the southeast side of Hegenberger Road near the intersection of Hegenberger Road and Airport Access Road in the southern portion of the City of Oakland. The Property consists of an approximately 1.17-acre rectangular shaped parcel of land that is improved with an approximately 1,300-square foot one story commercial building and associated paved areas. The Property is currently used for a parking lot and is planned to be redeveloped with a hotel.

The location of the Property is shown on **Figure 1**. The layout of the Property is shown on **Figure 2**.

1.1 BACKGROUND

The history and the description of the Property is based on information obtained during a Phase 1 Environmental Site Assessment conducted by ERAS in 2014.

The Property is located in an area of mixed commercial and residential land uses. The Property was occupied by a parking lot for live/work lofts at 1091 Calcot Place and storage and repair of personal automobiles and vehicles formerly used in movie production.

To the northeast of the Property was Southern Pacific Railroad. To the southeast was Calcot Place and across the street was a commercial building at 1092 Calcot Place. To the west of the Property was Nimitz Freeway (I-880). The Property also wrapped around the 1091 Calcot Building which according to signs was formerly occupied by California Cotton Mills. The building was indicated to have been built in 1883. The former California Cotton Mill building is now

[1] TPH-gro, TPH-dro, and TPH-oro are methods that compare analytical results to standards for gasoline, diesel and motor oil, respectively. Therefore analytical results are estimates of quantities based on what would be expected for the range of hydrocarbon results for the standard. Gasoline range organics (gro) are those hydrocarbon compounds that are in the range of C6 to C10, diesel range organics (dro) are those hydrocarbon compounds that are in the range of C10 to C23, and oil range organics (oro) are those hydrocarbon compounds that are in the range of C18 to C36. There can be overlap in reporting methods as well as identification of compounds that fall within the standard that may not necessarily be derived from gasoline, diesel, or oil.

occupied by live/work lofts.

The Property contained parking and storage space along with one small building of brick construction on a concrete slab foundation. The building was located on the far northwestern corner of the Property. The building was full of vehicles, parts, and various other items for the restoration of vehicles.

The yard area was divided into two areas. The southeastern-most portion was an asphalt paved parking area for the live/work lofts at 1091 Calcot Place. No leaks or spills were observed in this area other than a little bit of oil spotting from parked vehicles. None of the oil spotting was in the area of cracks or drains. The northeastern portion of the Property was an asphalt paved yard area used for the storage of vehicles, storage containers, storage trailers, and various other automotive items.

Septic systems, drywells, monitoring wells or evidence of subsurface investigations were not observed on the Property by ERAS. No evidence of aboveground storage tanks (ASTs) or underground storage tanks (USTs) were observed on the Property by ERAS. Evidence of leakage, spillage, and dumping of regulated material was observed on the Property by ERAS.

1.2 PREVIOUS SUBSURFACE INVESTIGATIONS

ERAS Environmental conducted a subsurface investigation of the Property on December 23, 2014 that included the drilling of three soil borings and the collection of groundwater samples. The soil borings were drilled directly in the area of the former USTs. The results of the analysis are summarized as follows.

	TPH-dro	TPH-oro	TPH-dro*	TPH-oro*
	µg/L			
B-1	79	**440**	NA	NA
B-2	**6,100**	**5,100**	NA	NA
B-3	**15,000**	**23,000**	**20,000**	**86,000**
ESL-DW	100	100	100	100

Notes:

ESL – environmental screening limits set forth by the California Regional Water Quality Control Board as of December 2013 for commercial/industrial.

DW – drinking water NA – Not Analyzed * - Analyzed without silica gel clean-up

The results of the investigation indicated the former presence of the USTs on the Property have impacted the subsurface environmental conditions beneath the Property at concentrations above the ESLs. ERAS concluded that additional investigations would likely be needed to characterize the nature and extent of the petroleum hydrocarbon contaminants detected as well as typical semi-volatile organic compounds found in fuel and oil blends.

ERAS recommended the report be provided to the Alameda County Department of Environmental Health and the California Regional Water Quality Control Board (RWQCB) for further oversight.

2.0 REGIONAL GEOLOGY/HYDROLOGY

The Property is in the southern part of the City of Oakland in the San Francisco Bay area. The San Francisco Bay area occupies a broad alluvial valley that slopes gently northward toward Oakland Bay and is flanked by alluvial fans deposited at the foot of the Diablo Range to the east and the Santa Cruz Mountains to the west. The northern part of the valley is called the Santa Clara Valley. Surface topography in the immediate vicinity of the Property is gently sloping down to the south west towards tidally influenced Brooklyn Basin Tidal Canal.

The Property is at an elevation of approximately 15 feet above Mean Sea Level according to the United States Geological Survey (USGS) Oakland East Quadrangle California 7.5 Minute Series topographic map.

Materials underlying the site are unconsolidated deposits of near shore and beach sediments, deposited in Oakland Bay at higher sea level stands. At shallow depths beneath these sediments are chert, greywacke, serpentine and shale bedrock that are a part of the Cretaceous to Jurassic-aged Franciscan Formation. Bedrock is exposed to the west and north on the upland surfaces.

The subject site is located on the San Francisco Bay Plain in the northernmost part of the Santa Clara Valley Groundwater Basin, (DWR, 1967), the surface of which slopes gently down toward the Brooklyn Basin Tidal Canal.

The regional groundwater flow follows the topography, moving from areas of higher elevation to areas of lower elevation. The regional groundwater flow direction in the area of the Property is estimated to be toward the southwest toward the Brooklyn Basin Tidal Canal.

Based on the subsurface investigation conducted by ERAS, the subsurface vadose zone lithology encountered consisted of silty clay underlain by the water bearing zone which consisted of silt and silty sand. Groundwater was encountered at depths ranging from 3 to 16 feet bgs.

3.0 SITE CONCEPTUAL MODEL

A summary of the current site conceptual model is included on **Table 1** and the current data gaps and proposed investigation are summarized on **Table 2**.

3.1 HYDROGEOLOGIC SETTING

Shallow groundwater is variable and was observed between approximately 3-11 feet bgs. The shallow water-bearing zone appears to be located in thin clayey sand, sand, and silty sand units interbedded with clay. Groundwater is generally under water-table conditions, but may be locally confined by clay in the upper portion of the water-bearing zone. The base of the shallow

water bearing zone has not been determined.

3.2 EXTENT OF CONTAMINATION

All groundwater samples collected from the three borings contained concentrations of TPH-dro, and TPH-oro. The range of concentration for TPH-dro was 79-15,000 micrograms per liter (µg/L), and for TPH-oro the range was 440-23,000 µg/L. The extent of contamination in the area of the former USTs has not been determined.

4.0 WORK PLAN

4.1 SCOPE OF PROPOSED INVESTIGATION

ERAS proposes a scope of work for this investigation as follows.

- Obtain a permit for drilling from the Alameda County Public Works Department (ACPWD).
- Clear the boring locations for the presence of utilities by notifying Underground Service Alert and employing a private underground locating/clearance service.
- Advance four borings using a direct push sample rig to approximately 20 feet in the vicinity of the former USTs. These borings will be continuously logged by a field geologist.
- Groundwater samples will be collected from 18-20 feet bgs unless encountered in sufficient volume in the 10-12 foot zone.
- Analyze the groundwater samples for the presence of TPH-dro and TPH-oro as well as semi-volatile organic compounds (SVOCs).
- Prepare a report detailing the field procedures and results of the investigation.

4.2 FIELD WORK COORDINATION

ERAS will procure a drilling permit from the ACPWD prior to drilling activities.

The boring locations will be marked with paint and Underground Service Alert notified at least 48 hours in advance to give owners of underground utilities an opportunity to mark their lines. Prior to drilling, each boring location will be cleared using a private underground utility locator.

4.3 BORING LOCATIONS AND SAMPLING

The locations of the borings are shown on **Figure 2**. The Standard Operating Procedures for direct-push sampling is included in **Appendix C**.

Four borings will be advanced using a direct push sample rig to a maximum of approximately 20 feet in the vicinity of the former USTs in an attempt to vertically and horizontally delineate the extent of the contamination. These borings will be continuously logged.

Groundwater samples will be collected from each boring. The soil and groundwater samples will be kept chilled pending transport under chain-of-custody procedures to a California certified environmental analytical laboratory.

The groundwater samples will be analyzed for the presence of TPH-dro and TPH-oro as well as SVOCs.

4.4 FIELD AND REPORT SCHEDULE

The field work will be scheduled as soon as possible following approval of this work plan by the ACEHD. A report will be submitted within 30 working days of the completion of field activities.

5.0 REFERENCES

California Department of Water Resources, Evaluation of Ground Water Resources South Bay, Appendix A: Geology, Bulletin 118-1, August 1967.

California Regional Water Quality Control Board, Water Quality Control Plan, San Francisco Bay Basin Region (2), December 1986.

ERAS Environmental, Inc., Limited Soil and Groundwater Investigation Report, APN 19-15-11, 1091 Calcot Place, Oakland, California, January 9, 2015.

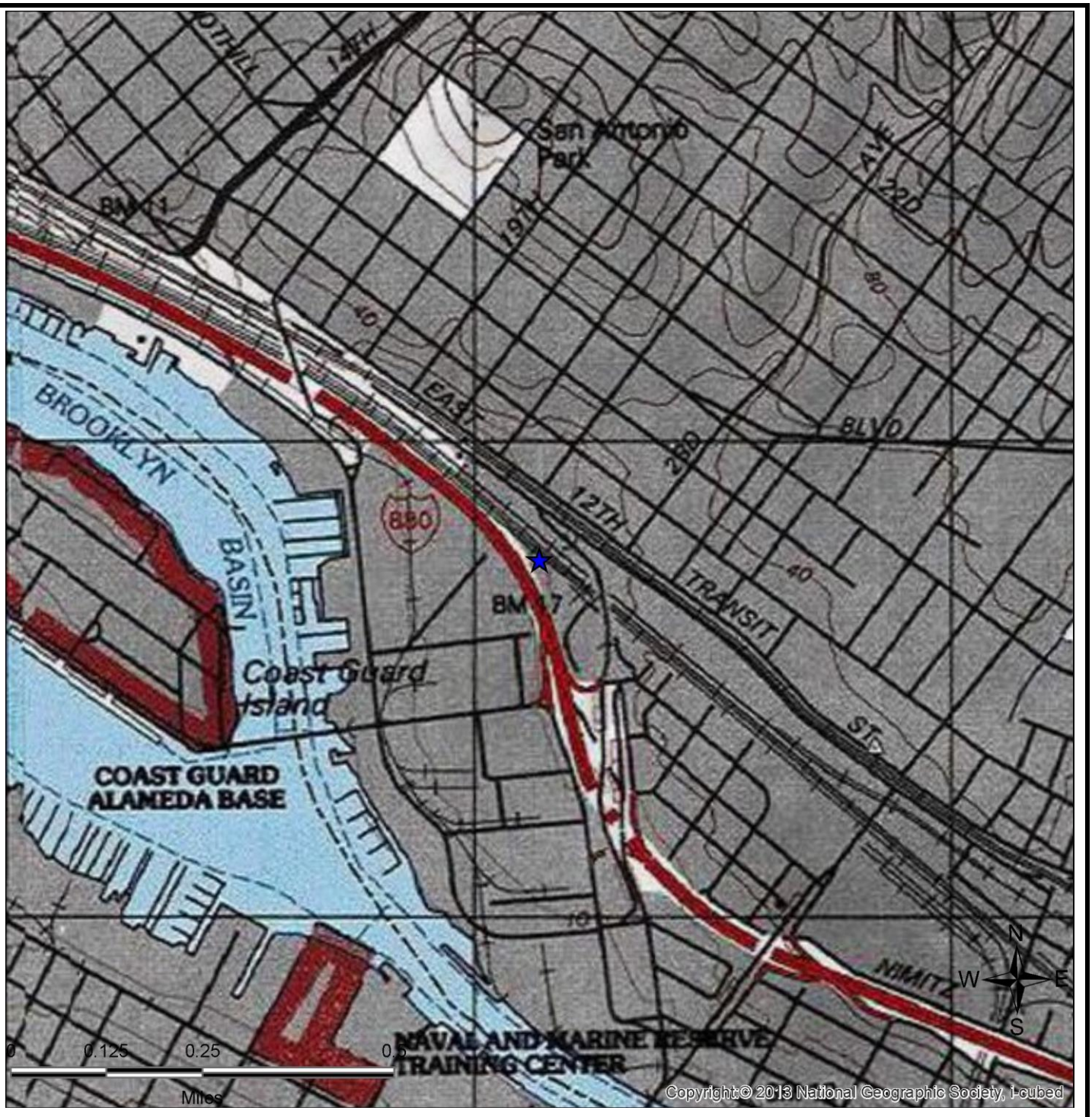
Goldman, Harold B., Geology of Burlingame Bay prepared for Burlingame Bay Conservation and Development Commission, February 1967.

Helley, E.J., La Joie, K.R., Spangle, W.E., and Blair, M.L., Flatland Deposits of the Burlingame Bay Region, California - their geology and engineering properties and their importance to comprehensive planning, U.S. Geological Survey Professional Paper 943, 1974.

P&D Environmental Inc., Groundwater Monitoring and Sampling Report, (October 18, 2011 Sampling Event), Mel Senna Brake Service, 2301 East 12th Street, Oakland, California, December 18, 2013.

Sanborn fire insurance maps were reviewed at the San Francisco Public Library. Sanborn maps dated 1911, 1950, and 1951 were reviewed.

FIGURES AND TABLES



SITE LOCATION TOPOGRAPHIC MAP

U.S. Geological Survey. Oakland East Quadrangle, 7.5 Minute Series

ERAS Environmental, Inc.	19-55-11 Calcot Pl. Oakland, CA	FIGURE: 1 JOB: DATE: 10/20/2014

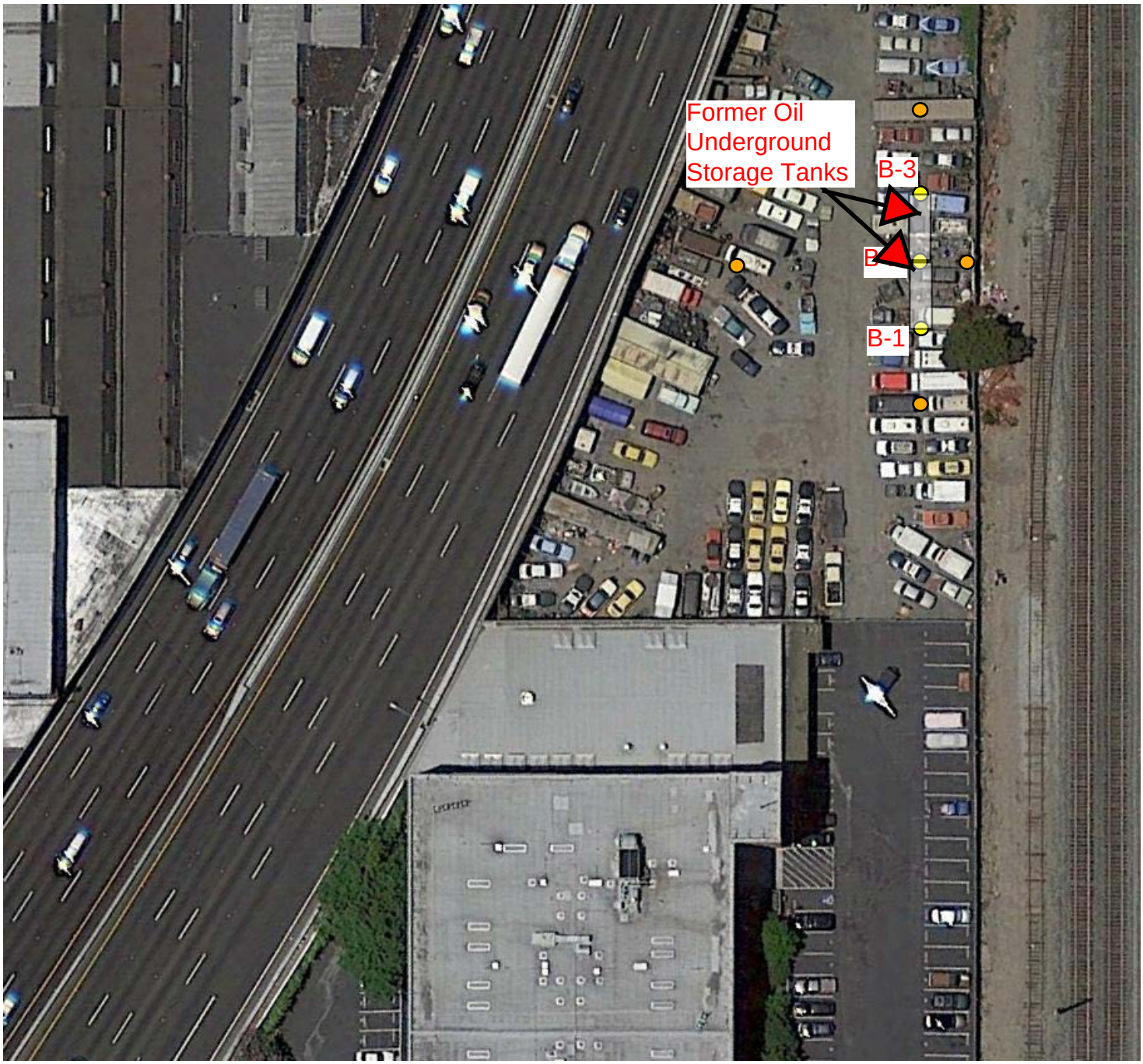


FIGURE 2
BORING LOCATION MAP
APN 19-55-11 Calcot Place, Oakland
ERAS Project # 14229B

TABLE 1 - SITE CONCEPTUAL MODEL
1091 Calcot Place, Oakland

CSM Element	CSM Sub-Element	Description	Potential Data Gap(s)
Geology and Hydrogeology	Regional	The Property is in the southern part of the City of Oakland in the San Francisco Bay area. The San Francisco Bay area occupies a broad alluvial valley that slopes gently northward and is flanked by alluvial fans deposited at the foot of the Diablo Range to the east and the Santa Cruz Mountains to the west. Surface topography in the immediate vicinity of the Property is gently sloping down to the northwest towards Airport Channel. The Property is at an elevation of approximately 15 feet above Mean Sea Level according to the United States Geological Survey (USGS) Oakland East Quadrangle California 7.5 Minute Series topographic map. Materials underlying the site are unconsolidated deposits of near shore and beach sediments, deposited in Oakland Bay at higher sea level stands. At shallow depths beneath these sediments are chert, greywacke, serpentine and shale bedrock that are a part of the Cretaceous to Jurassic-aged Franciscan Formation. Bedrock is exposed to the east-northeast on the upland surfaces. The subject site is located on the San Francisco Bay Plain in the northernmost part of the Santa Clara Valley Groundwater Basin, (DWR, 1967), the surface of which slopes gently down toward west. The regional groundwater flow follows the topography, moving from areas of higher elevation to areas of lower elevation. The regional groundwater flow direction in the area of the Property is estimated to be toward the west toward the Brooklyn Basin.	None
	Site	***Geology:*** Based on lithologic logs prepared from borings on the Property the subsurface lithology consists of silty clay underlain by the water bearing zone which consisted of silt and silty sand.	None
		Hydrogeology: Groundwater at the Property is likely contained in thin sand stringers within the silty clay. Groundwater location is highly variable and was encountered at depths ranging from 3 to 16 feet bgs.	None
Surface Water Bodies	--	The closest surface water bodies are the Brooklyn Basin, a portion of San Francisco Bay which was located approximately 1/4 of a mile to the west of the Property.	None
Nearby Wells	--	A well survey has not been conducted but has been requested from Alameda County and State of California	Yes
CSM Element	**CSM Sub-Element**	**Description**	**Potential Data Gap(s)**
Constituents of Concern	--	Constituents of concern have been identified by comparing analytical results to ESLs for commercial land use and for groundwater that is considered a current or potential drinking water source. Constituents of concern that have been identified include petroleum hydrocarbons quantified as diesel and oil range organics (TPH-dro, and TPH-oro). The results of investigations completed indicate elevated concentrations of petroleum hydrocarbons in groundwater in the area of the former fuel oil USTs.	None
Potential Sources	On-site	The Property formerly contained two USTs used to store fuel oil.	None
		There is no record of the removal of the USTs but a geophysical survey in the area of the former USTs indicated their absence.	None
CSM Element	**CSM Sub-Element**	**Description**	**Potential Data Gap(s)**
Nature and Extent of Environmental Impacts	Extent in Soil, TPH-dro	Concentrations of TPH-dro above the commercial ESL for areas where groundwater is considered a potential source of drinking water have been detected in groundwater samples collected from borings B-2 and B-3. Concentrations ranged from 6,100 to 15,000 micrograms per liter.	None
	Extent in Soil, TOG/TRPH	Concentrations of TPH-oro above the commercial ESL for areas where groundwater is considered a potential source of drinking water have been detected in groundwater samples collected from borings B-2 and B-3. Concentrations ranged from 5,100 to 23,000 micrograms per liter.	The full extent of the contamination associated with the former sump has not been determined
	Extent in Soil, VOCs	VOCs have not been analyzed but are not expected to be present based on the nature of the contaminant.	The full extent of the contamination associated with the former sump has not been determined
	Extent in Soil, SVOCs	SVOCs have not been analyzed.	The full extent of the contamination associated with the former sump has not been determined
			The full extent of the contamination associated with the former sump has not been determined

TABLE 1 - SITE CONCEPTUAL MODEL
1091 Calcot Place, Oakland

	Extent in Soil, Metals	Metals detected to be present on the Property have included cadmium, chromium, lead, nickel, and zinc. None of the concentrations detected were found to be above the ESL for commercial areas where groundwater is considered a potential source of drinking water	The full extent of the contamination associated with the former sump has not been determined
Nature and Extent of Environmental Impacts	Extent in Groundwater, TPH-dro	The extent of TPH-dro has not been determined. The detected concentrations in two of the borings were above the ESL for a commercial site where groundwater is considered a potential source of drinking water.	None
	Extent in Groundwater, TOG/TRPH	The extent of TPH-oro has not been determined. The detected concentrations in all three borings were above the ESL for a commercial site where groundwater is considered a potential source of drinking water.	None
	Extent in Groundwater, SVOCs	No analyses for SVOCs has been conducted.	None
Nature and Extent of Environmental Impacts		The extent of contamination in groundwater is unknown.	The full extent of the contamination associated with the former sump has not been determined
Migration Pathways	Potential Conduits	The locations of on-site utilities, including sanitary sewer laterals, water, gas, and electrical lines are unknown.	The locations of onsite utilities has not been determined
Potential Receptors/Risk	On-site	Potable water at the site currently is provided via municipal supply and will continue to be in the foreseeable future. As such, direct contact to groundwater is not contemplated.	Based on evaluation of the data relative to ESLs, it is likely that some risk for longer- term site occupants exists.
Potential Receptors/Risk	Off-site	A well survey has not been conducted but has been requested from Alameda County and State of California	A well survey has not been completed

Notes

1. ERAS Environmental, Inc. Phase 1 Environmental Site Assessment, APN 19-55-11, Oakland, California, November 6, 2014.
2. ERAS Environmental, Inc. Limited Soil and Groundwater Investigation, APN 19-55-11 on Calcot Place, Oakland, California, January 9, 2015.

Abbreviations

bgs = below ground surface
VOCs = volatile organic compounds
SVOCs = semi volatile organic compounds
TPH-dro = total petroleum hydrocarbons quantified as diesel range organics
TOG = total oil and grease
TRPH = total residual petroleum hydrocarbons
µg/L = micrograms per liter

TABLE 2 - DATA GAPS AND PROPOSED INVESTIGATION

1091 Calcot Place, Oakland CA

Item	Data Gap	Proposed Investigation	Rational	Analysis
1	The full extent of the contamination associated with the former USTs has not been determined	Advance four borings using a direct push sample rig to about 20 feet bgs in the vicinity of the former USTs in an attempt to vertically and laterally delineate the extent of the contamination. These borings will be continuously logged. Soil and groundwater samples will be collected from each boring. The soil and groundwater samples will be kept chilled pending transport under chain-of-custody procedures to a California certified environmental analytical laboratory.	Vertically and horizontally delineate the extent of the contamination associated with the former USTs.	The soil and groundwater samples will be analyzed for the presence of TPH-dro, TPH-oro and SVOCs.

Abbreviations
bgs = below ground surface
TPH-dro = total petroleum hydrocarbons quantified as diesel range organics
TPH-oro = total petroleum hydrocarbons quantified as oil range organics
SVOCs = semi-volatile organic compounds

APPENDIX A

ACHCSA Letter – April 14, 2015

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
ALEX BRISCOE, Agency Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-933

April 14, 2015

East Bay Lofts LLC
c/o: Bob Winet
36966 Pinto Palm Street
Rancho Mirage, CA 92270
(Sent via E-mail to: bwinet3@verizon.net)

Subject: Request for Site Investigation Work Plan and Initial Site Conceptual Model; Fuel Leak Case No. RO0003162 and GeoTracker Global ID T10000006533, California Cotton Mills, 1091 Calcot Place, Oakland, CA 94606

Dear Mr. Bob Winet:

Alameda County Environmental Health (ACEH) has reviewed the case file, including the January 9, 2015 report titled "*Limited Soil and Groundwater Investigation APN 19-55-11 on Calcot Place, Oakland, California*" (SWI) generated by Eras Environmental, Inc. The report documents the December 2014 magnetometer and ground-penetrating radar (GPR) survey of the area known to have formerly contained two oil underground storage tanks (USTs), and the drilling and groundwater sampling at three locations near the former oil USTs. Soil boring B-1 was advanced to 8 feet below grade surface (bgs), boring B-2 was advanced to 16.5 feet bgs, and boring B-3 was advanced to 17 feet bgs. Groundwater was encountered at depths ranging from 3 to 16 feet bgs. For this initial site assessment, total petroleum hydrocarbons as diesel range organics (TPH-dro) and TPH as oil range organics (THP-oro) only were analyzed to ascertain the potential existence of contamination in groundwater. Maximum groundwater concentrations detected were 15,000 micrograms per liter (ug/L) TPH-dro and 23,000 ug/L TPH-oro, analyzed with silica gel cleanup. Additional signs of contamination included slight hydrocarbon odor and diesel odor (B-2, B-3), and elevated organic vapor meter readings during the soil borings (maximum of 11.6 parts per million at 10.5 feet bgs at B-2). Thank you for your submission of the initial subsurface UST geophysical survey and preliminary groundwater investigation report.

The subject site has been occupied since at least 1883 when the California Cotton Mills Company established manufacturing. Subsequent to the cotton mill's cessation of operations circa 1954, the subject site has been occupied by a welding supply, plastics manufacturer, truck rental, personal item storage; and, since 1979 to current, per Eras' interview with Mr. Robert Winet, property managing member, the subject property has been utilized for cargo container storage and vehicle parking. The 1911 Sanborn Fire Insurance map shows the existence of three furnaces and two underground oil storage tanks along the northeastern side of the property. On the 1950 Sanborn Fire Insurance map, the underground oil storage tanks are not depicted. No records or data (including site interviews and Oakland Fire Department documents) have been found during the Phase 1 Environmental Site Assessment (ERAS, report date November 6, 2014) to indicate that the underground oil tanks were properly removed, abandoned, or sampled. During the December 2014 SWI, the area of the former oil USTs was screened using a magnetometer and GPR to confirm that the oil USTs had been removed prior to sampling. Large amounts of buried metal (likely old foundations from former manufacturing equipment) were detected in the vicinity of the area known to have formerly contained the oil USTs; however, the GPR did not indicate the presence of the oil USTs still in place.

ACEH has evaluated the data and recommendations presented in the above-mentioned reports, in conjunction with the case files, to determine if the site is eligible for closure as a low risk site under the *California State Water Resources Control Board's (SWRCBs) Low-Threat Underground Storage Tank Case Closure Policy (LTCP)*. Based on ACEH staff review, we have determined that the site fails to meet the LTCP General Criteria **b** (Petroleum Use Only), **d** (Free Product), **e** (Site Conceptual Model), **f** (Secondary Source Removal), **g** (MTBE Analysis), and the Media-Specific Criteria for Groundwater, the Media-Specific Criteria for Petroleum Vapor Intrusion to Indoor Air, and the Media-Specific Criteria for Direct Contact and Outdoor Air Exposure (see GeoTracker for case-specific files (http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T10000006533) and a copy of the LTCP (http://www.waterboards.ca.gov/ust/lt_cls_plcy.shtml).

Further work is required to assess the nature, extent and mobility of contamination around the area of the former oil USTs and to characterize the case. Please ensure that the case is characterized in light of the requirements contained in the LTCP. The evaluation of the site under the LTCP that is presented below is intended to initiate further discussions, submittal of other available documents, or the collection of additional data in order to determine if, or when, the site can be closed under the LTCP and to document current LTCP data gaps. Therefore, at this juncture ACEH requests that you prepare a Site Investigation Work Plan that is supported by an Initial Site Conceptual Model (SCM) to address the Technical Comments provided below.

TECHNICAL COMMENTS

1. **LTCP General Criteria b (Petroleum Use Only) –** Due to the historical nature of the USTs and their undocumented, anecdotal evidence of past use (as "oil" denoted in Sanborn maps), and unknown out-of-service date, ACEH requests an initial, expanded list of analytes to be tested. Therefore, ACEH requests representative soil and groundwater samples be analyzed for "full-scan" volatile organic compounds (VOCs) (including chlorinated and halogenated hydrocarbons) and semi-VOCs including poly-aromatic hydrocarbons (PAHs) and naphthalene. Please include the 5 priority pollutant metals (LUFT 5 metals: Cd, Cr, Ni, Pb, Zn), lead scavengers (TML, EDB, EDC), and fuel oxygenates (MTBE, ETBE, TAME, TBA, DIPE). Additionally, to identify and target the specific hydrocarbon present at the site ACEH requests that petroleum hydrocarbon fingerprinting be used to identify the full TPH range (e.g. gasoline, diesel, oil) of COPCs present in the subsurface. Include the appropriate analytical methods and sampling locations in Technical Comment 9 below.

2. **LTCP General Criteria d (Free Product) –** ACEH's review of the case files indicates the potential presence of residual or free product at the site. Specifically, a TPH-gro concentration of 15,000 ug/L exceeds concentrations the technical justification papers for the LTCP and the California Leaking Underground Fuel Tank manual indicate to be indirect evidence of potential free-phase petroleum hydrocarbons (5 mg/L and 3.97 mg/L, respectively). Free-phase petroleum hydrocarbons will naturally attenuate at a slower rate and persist for longer periods of time in the subsurface contributing to ongoing indoor air vapor intrusion, direct contact exposure/outdoor air exposure, and soil leaching to groundwater. Therefore, ACEH requests the installation of permanent monitoring wells with appropriate screen interval to assess the potential presence, nature, extent, and mobility of LNAPL.

3. **LTCP General Criteria e (Site Conceptual Model) –** ACEH's review of the case files indicates that additional data collection and analysis is required to assess the: a) nature and extent of potential groundwater impacts (e.g. dissolved concentrations, plume stability, and plume length), b) hydrogeology (e.g. depth-to-water seasonal variations, and groundwater flow direction and gradient), c) potential sensitive receptors (e.g. water supply wells, surface waters, sensitive human receptors), d) soil areal extent and depth to support compliance with General Criteria **d** and **f** as discussed in Technical Comments 2 and 4, and e) Media Specific Criteria for Groundwater, Vapor Intrusion to Indoor Air, and Direct Contact and

Outdoor Air Exposure, and f) additional potential constituents of concern as described in Technical Comments 1 and 5.

Please be aware that ACEH has knowledge that an abandoned water supply well was historically present on the California Cotton Mills site. The exact location is not known and the supply well may have existed on the west or east side of Highway 880. During site investigations, ACEH requests efforts be undertaken to ascertain if the abandoned water well remains during conduct of the water wells surveys. Should the abandoned well be identified on the subject site, ACEH requests determination of the well's potential to act as a vertical migration conduit and that the well be properly destroyed if necessary.

4. **LTCP General Criteria f (Secondary Source Removal) –** As there appears to be a general lack of an understanding of source zone locations (due to the historical nature of the site), although removal of the USTs is potentially confirmed by geophysical methods; however, confirmation soil sampling data does not exist, ACEH requests adequate delineation of lateral and vertical extents of soil impact. The soil impacts should be delineated until the furthest sample indicates that contaminant concentrations are below the appropriate screening standards and protective of anticipated exposure pathways.

5. **General Criteria g (Soil and Groundwater Have Been Tested for MTBE) –** *Health and Safety Code section 25296.15* prohibits closing a UST case unless the soil, groundwater, or both, as applicable, have been tested for MTBE and the results of that testing are known to the Regional Water Board. The exception to this requirement is where a regulatory agency determines that the UST that leaked has only contained diesel or jet fuel. Before closing a UST case pursuant to this policy, the requirements of *section 25296.15*, if applicable, shall be satisfied.

   ACEH's review of the case files indicates that site soil or groundwater have not been analyzed for MTBE. ACEH acknowledges that the USTs may have been taken out of service prior to the introduction of MTBE as a fuel oxygenate circa late 1970's; additionally, "oil" was noted on the historical Sanborn maps, likely a heavier Bunker C-type fuel for the cotton mill furnaces. However, as there are many unknowns regarding the history of these USTs, please present a strategy in the Work Plan (described in Technical Comment 9 below) to address the item discussed above. Alternatively, please provide justification of why the site satisfies this general criterion in the SCM described in Technical Comment 9 below.

6. **LTCP Media-Specific Criteria for Groundwater –** *State Water Board Resolution 92-49* directs that water affected by an unauthorized release attain either background water quality or the best water quality that is reasonable if background water quality cannot be restored. To satisfy the media-specific criteria for groundwater, the contaminant plume that exceeds water quality objectives (WQOs) must be stable or decreasing in areal extent, and meet all of the additional characteristics of one of the five classes of sites listed in the LTCP groundwater-specific criteria.

   Our review of the case files indicates that additional data collection is required to support the requisite characteristics of plume length and plume classification, dissolved-phase impacts, and potential for free product, as follows:

   a) Groundwater concentrations (notably TPH-dro at 15,000 ug/L) are indirectly indicative of free product;

   b) Concentrations, plume extent, and stability of contaminants are not known;

   c) A SCM has not been generated that includes a well survey or identification of water supply wells, or surface water bodies within a 2,000 foot radius; and

   d) A SCM has not been generated to define down-gradient sensitive receptors (e.g. residences, hospitals, schools, daycare facilities, elder care facilities, churches, and parks) that may be at risk depending on lateral extent of soil impact, groundwater depth and flow direction, and presence of basements.

Please present a strategy in the Work Plan (described in Technical Comment 9 below) to address the items discussed above. Alternatively, please provide justification of why the site satisfies the Media-Specific Criteria for Groundwater in the focused SCM described in Technical Comment 9 below.

7. **LTCP Media-Specific Criteria for Petroleum Vapor Intrusion to Indoor Air –** The LTCP describes conditions, including bio-attenuation zones, which if met will assure that exposure to petroleum vapors in indoor air will not pose unacceptable health risks to human occupants of existing or future site buildings, and adjacent parcels. Appendices 1 through 4 of the LTCP criteria illustrate four potential exposure scenarios and describe characteristics and criteria associated with each scenario. Alternatively, the policy allows for a site-specific risk assessment that demonstrates that human health is protected to the satisfaction of the regulatory agency; or, controlling exposure through the use of mitigation measures, or institutional or engineering controls, the regulatory agency determines that petroleum vapors migrating from soil or groundwater will have no significant risk of adversely affecting human health.

   ACEH's review of the case files indicates that additional data collection and analysis are required support the requisite characteristics of one of the four scenarios. Specifically, it appears that petroleum contamination migrated into shallow groundwater beneath the site, as evidenced by dissolved-phase TPH concentrations. Listed below are additional data gaps and exposure risks to be addressed:

   a) Depth-to-groundwater is an integral part of establishing the bio-attenuation zone. Currently, depth-to-groundwater is estimated from three on-site grab-groundwater sample points ranging between 3 to 16 feet bgs. Additional site-specific data is required to evaluate the stabilized groundwater depth, seasonal fluctuations in groundwater, and groundwater flow direction.

   b) Concentrations and lateral extents of VOCs in soil and groundwater are unknown.

   c) Concentrations of total TPH in soil are unknown with regard to establishing an adequate bio-attenuation zone beneath current or future building foundations. Lack of oxygen concentration (scenario-specific), dissolved-phase benzene concentration, presence (or lack) of LNAPL, and depth-to-water create further data gaps to establishing an adequate bio-attenuation zone.

   d) Current use of the property is zoned as commercial (currently a parking lot for storage of vehicles and tires). Should redevelopment occur with construction of commercial or residential structures, the receptor type and use creates a unique risk profile.

   Therefore, please present a strategy in the Work Plan (described in Technical Comment 9 below) to collect additional data to satisfy the bio-attenuation zone characteristics of Scenarios 1, 2, or 3, or to collect soil gas data to satisfy Scenario 4.

   Alternatively, please provide justification of why the site satisfies the Media-Specific Criteria for Petroleum Vapor Intrusion to Indoor Air in a SCM that assures that exposure to petroleum vapors in indoor air will not pose unacceptable health risks to occupants of adjacent and future onsite buildings.

   Please note that if direct measurement of soil gas is proposed, ensure that your strategy is consistent with the field sampling protocols described in the Department of Toxic Substances Control's *"Final Guidance for the Evaluation & Mitigation of Subsurface Vapor Intrusion to Indoor Air (October 2011)"* and *"Advisory – Active Soil Gas Investigations (April 2012)"*. Consistent with the guidance, ACEH requires installation of permanent vapor wells to assess temporal and seasonal variations in soil gas concentrations.

8. **LTCP Media-Specific Criteria for Direct Contact and Outdoor Air Exposure** – The LTCP describes conditions where direct contact with contaminated soil or inhalation of contaminants volatized to outdoor air poses a low threat to human health. According to the policy, release sites where human exposure may occur satisfy the media-specific criteria for direct contact and outdoor air exposure and shall be considered low-threat if the maximum concentrations of petroleum constituents in soil are less than or equal to those listed in Table 1 for the specified depth bgs. Alternatively, the policy allows for a site-specific risk

assessment that demonstrates that maximum concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health; or, controlling exposure through the use of mitigation measures, or institutional or engineering controls, the regulatory agency determines concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health.

ACEH's review of the case files indicates that additional data is required to support evaluation of soil direct contact and outdoor air exposure. As indicated in Technical Comments 7 and 10, please indicate the reasonable potential future use of the subject property. Therefore, please present a strategy in the Work Plan described in Technical Comment 9 below to collect sufficient data to satisfy the direct contact and outdoor air exposure criteria that delineate the areas of impact in relation to sensitive receptors and that meet Data Quality Objectives (DQOs). Sample and analyze soil in the 0 to 5 and the 5 to 10 foot intervals, at the groundwater interface, lithologic changes, and at areas of obvious impact. Collect soil samples from each boring and propose the requisite analysis including naphthalene and PAHs.

Alternatively, please provide justification of why the site satisfies the Media-Specific Criteria for Direct Contact and Outdoor Air Exposure in the focused SCM described in Technical Comment 9 below that assures that exposure to petroleum constituents in soil will have no significant risk of adversely affecting human health.

9. **Request for a Work Plan, and Initial Site Conceptual Model (SCM) –** In order to determine the magnitude of subsurface, residual contamination in soil and groundwater, ACEH requests the submittal of a Work Plan and initial SCM by a consultant qualified to undertake the work by the date identified below. Please prepare the Work Plan to address the technical comments listed above. Please support the scope of work in the Work Plan with a SCM and Data Quality Objectives (DQOs) that relate the data collection to each LTCP criteria. For example please clarify which scenario within each Media-Specific Criteria a sampling strategy is intended to apply to. Include in the Work Plan the appropriate soil and groundwater sampling and analysis based on US EPA SW-846 methods.

   In order to expedite review, ACEH additionally requests the SCM be presented in a tabular format that highlights the major SCM elements and associated data gaps which need to be addressed to progress the site to case closure under the LTCP. Please see **Attachment A "Site Conceptual Model Requisite Elements**". Please sequence activities in the proposed Work Plan investigation scope of work to enable efficient data collection in the fewest mobilizations possible.

10. **Request for Redevelopment Building Plans –** Please include the site's reasonably anticipated future use redevelopment plans with the Work Plan. Building structures that affect the subsurface environment may affect potential direct contact and vapor intrusion to indoor air. Notably, building structures that extend below the ground surface (e.g. basements, parking structures) and elevator shafts may reduce the vertical separation distance between contaminant source and receptors and decrease bio-attenuation zone thickness. Additionally, subsurface structures may create preferential pathways for vapor migration to indoor air. A more accurate evaluation of human health risk, complete or potentially complete pathways to exposure, and mitigation methods (if necessary) can be determined by evaluation of potential future use redevelopment plans.

11. **GeoTracker Compliance –** A review of the *State Water Resources Control Board's (SWRCB) GeoTracker website* indicates the site has not yet been claimed. Because this is a state requirement, ACEH requests that the site be claimed in GeoTracker by the date identified below.

    Pursuant to *California Code of Regulations (CCR), Title 23, Division 3, Chapter 16, Article 12, Sections 2729 and 2729.1*, beginning September 1, 2001, all analytical data, including monitoring well samples, submitted in a report to a regulatory agency as part of the UST or LUST program, must be transmitted electronically to the SWRCB GeoTracker system via the internet. Also, beginning January 1, 2002, all permanent monitoring points utilized to collect groundwater samples (i.e. monitoring wells) and submitted

in a report to a regulatory agency, must be surveyed (top of casing) to mean sea level and latitude and longitude to sub-meter accuracy using NAD 83. A California licensed surveyor may be required to perform this work. Additionally, pursuant to *California Code of Regulations, Title 23, Division 3, Chapter 30, Articles 1 and 2, Sections 3893, 3894, and 3895*, beginning July 1, 2005, the successful submittal of electronic information (i.e. report in PDF format) shall replace the requirement for the submittal of a paper copy. Please claim your site and upload all future submittals to GeoTracker and ACEH's ftp server by the date specified below. Electronic reporting is described below on the attachments.

Additional information regarding the SWRCB's GeoTracker website may be obtained online at http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/ and http://www.swrcb.ca.gov/ust/electronic_submittal/report_rqmts.shtml) or by contacting the GeoTracker Help Desk at geotracker@waterboards.ca.gov or (866) 480-1028.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please be aware that site investigation/site cleanup costs may be reimbursable from the California Underground Storage Tank Cleanup Fund. The application and additional information is available at the State Water Resources Control Board's website at http://www.waterboards.ca.gov/water_issues/programs/ustcf. Please be aware that reimbursement monies are contingent upon maintaining compliance with directives from ACEH.

TECHNICAL REPORT REQUEST

Please upload technical reports to the ACEH ftp site (Attention: Matthew Soby), and to the State Water Resources Control Board's GeoTracker website, in accordance with the following schedule and file naming convention:

- **July 15, 2015 (90 days) –** GeoTracker Compliance, Site Investigation Work Plan, and Initial Site Conceptual Model (file name: **RO0003162_WP_R_yyyy-mm-dd**)
- **Sixty (60) Days After Work Plan Approval –** Soil and Groundwater Investigation Report (file name: **RO0003162_SWI_R_yyyy-mm-dd**)

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

Should you have any questions, please contact me at (510) 567-6725 or send me an electronic mail message at matthew.soby@acgov.org.

Sincerely,

Matthew Soby
Hazardous Materials Technician

Enclosures: Attachment 1 – Responsible Party(ies) Legal Requirements / Obligations
Electronic Report Upload (ftp) Instructions
Attachment A "Site Conceptual Model Requisite Elements"

cc:

Joyce Cunningham, DTZ, 555 12th Street, Suite 1400, Oakland, CA 94607 (Sent via E-mail to: joyce.cunningham@dtz.com)
Andrew Savage, ERAS Environmental, Inc., 1533 "B" Street, Hayward, CA 94541 (Sent via E-mail to: andrew@eras.biz)
David Siegel, ERAS Environmental, Inc., 1533 "B" Street, Hayward, CA 94541 (Sent via E-mail to: dave@eras.biz)
Dilan Roe, ACEH, (Sent via E-mail to: dilan.roe@acgov.org)
Matthew Soby, ACEH, (Sent via E-mail to: matthew.soby@acgov.org)
Electronic File, GeoTracker

Attachment 1

Responsible Party(ies) Legal Requirements / Obligations

REPORT REQUESTS

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of reports in electronic form. The electronic copy replaces paper copies and is expected to be used for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight Program FTP site are provided on the attached "Electronic Report Upload Instructions." Submission of reports to the Alameda County FTP site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) GeoTracker website. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for all groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitoring wells, and other data to the GeoTracker database over the Internet. Beginning July 1, 2005, these same reporting requirements were added to Spills, Leaks, Investigations, and Cleanup (SLIC) sites. Beginning July 1, 2005, electronic submittal of a complete copy of all reports for all sites is required in GeoTracker (in PDF format). Please visit the SWRCB website for more information on these requirements (http://www.waterboards.ca.gov/water_issues/programs/ust/electronic_submittal/).

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please note that delays in investigation, later reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to $10,000 per day for each day of violation.

Alameda County Environmental Cleanup Oversight Programs (LOP and SLIC)	**REVISION DATE:** May 15, 2014
	ISSUE DATE: July 5, 2005
	PREVIOUS REVISIONS: October 31, 2005; December 16, 2005; March 27, 2009; July 8, 2010, July 25, 2010
SECTION: Miscellaneous Administrative Topics & Procedures	**SUBJECT:** Electronic Report Upload (ftp) Instructions

The Alameda County Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of all reports in electronic form to the county's ftp site. Paper copies of reports will no longer be accepted. The electronic copy replaces the paper copy and will be used for all public information requests, regulatory review, and compliance/enforcement activities.

REQUIREMENTS

- **Please do not submit reports as attachments to electronic mail.**
- Entire report including cover letter must be submitted to the ftp site as **a single portable document format (PDF) with no password protection**.
- It is **preferable** that reports be converted to PDF format from their original format, (e.g., Microsoft Word) rather than scanned.
- **Signature pages and perjury statements must be included and have either original or electronic signature.**
- **Do not password protect the document**. Once indexed and inserted into the correct electronic case file, the document will be secured in compliance with the County's current security standards and a password. **Documents with password protection will not be accepted**.
- Each page in the PDF document should be rotated in the direction that will make it easiest to read on a computer monitor.
- Reports must be named and saved using the following naming convention:

  RO#_Report Name_Year-Month-Date (e.g., RO#5555_WorkPlan_2005-06-14)

Submission Instructions

1) Obtain User Name and Password
   a) Contact the Alameda County Environmental Health Department to obtain a User Name and Password to upload files to the ftp site.
      i) Send an e-mail to deh.loptoxic@acgov.org
   b) In the subject line of your request, be sure to include **"ftp PASSWORD REQUEST"** and in the body of your request, include the **Contact Information, Site Addresses**, and the **Case Numbers (RO# available in Geotracker) you will be posting for**.

2) Upload Files to the ftp Site
   a) Using Internet Explorer (IE4+), go to ftp://alcoftp1.acgov.org
      (i) Note: Netscape, Safari, and Firefox browsers will not open the FTP site as they are NOT being supported at this time.
   b) Click on Page located on the Command bar on upper right side of window, and then scroll down to Open FTP Site in Windows Explorer.
   c) Enter your User Name and Password. (Note: Both are Case Sensitive.)
   d) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
   e) With both "My Computer" and the ftp site open in separate windows, drag and drop the file(s) from "My Computer" to the ftp window.

3) Send E-mail Notifications to the Environmental Cleanup Oversight Programs
   a) Send email to deh.loptoxic@acgov.org notify us that you have placed a report on our ftp site.
   b) Copy your Caseworker on the e-mail. Your Caseworker's e-mail address is the entire first name then a period and entire last name @acgov.org. (e.g., firstname.lastname@acgov.org)
   c) The subject line of the e-mail must start with the RO# followed by **Report Upload**. (e.g., Subject: RO1234 Report Upload) If site is a new case without an RO#, use the street address instead.
   d) If your document meets the above requirements and you follow the submission instructions, you will receive a notification by email indicating that your document was successfully uploaded to the ftp site.

ATTACHMENT A

Site Conceptual Model Requisite Elements

ATTACHMENT A

Site Conceptual Model

The site conceptual model (SCM) is an essential decision-making and communication tool for all interested parties during the site characterization, remediation planning and implementation, and closure process. A SCM is a set of working hypotheses pertaining to all aspects of the contaminant release, including site geology, hydrogeology, release history, residual and dissolved contamination, attenuation mechanisms, pathways to nearby receptors, and likely magnitude of potential impacts to receptors.

The SCM is initially used to characterize the site and identify data gaps. As the investigation proceeds and the data gaps are filled, the working hypotheses are modified, and the overall SCM is refined and strengthened until it is said to be "validated". At this point, the focus of the SCM shifts from site characterization towards remedial technology evaluation and selection, and later remedy optimization, and forms the foundation for developing the most cost-effective corrective action plan to protect existing and potential receptors.

For ease of review, Alameda County Environmental Health (ACEH) requests utilization of tabular formats to (1) highlight the major SCM elements and their associated data gaps which need to be addressed to progress the site to case closure (see Table 1 of attached example), and (2) highlight the identified data gaps and proposed investigation activities (see Table 2 of the attached example). ACEH requests that the tables presenting the SCM elements, data gaps, and proposed investigation activities be updated as appropriate at each stage of the project and submitted with work plans, feasibility studies, corrective action plans, and requests for closures to support proposed work, conclusions, and/or recommendations.

The SCM should incorporate, but is not limited to, the topics listed below. Please support the SCM with the use of large-scaled maps and graphics, tables, and conceptual diagrams to illustrate key points. Please include an extended site map(s) utilizing an aerial photographic base map with sufficient resolution to show the facility, delineation of streets and property boundaries within the adjacent neighborhood, downgradient irrigation wells, and proposed locations of transects, monitoring wells, and soil vapor probes.

a. Regional and local (on-site and off-site) geology and hydrogeology. Include a discussion of the surface geology (e.g., soil types, soil parameters, outcrops, faulting), subsurface geology (e.g., stratigraphy, continuity, and connectivity), and hydrogeology (e.g., water-bearing zones, hydrologic parameters, impermeable strata). Please include a structural contour map (top of unit) and isopach map for the aquitard that is presumed to separate your release from the deeper aquifer(s), cross sections, soil boring and monitoring well logs and locations, and copies of regional geologic maps.

b. Analysis of the hydraulic flow system in the vicinity of the site. Include rose diagrams for depicting groundwater gradients. The rose diagram shall be plotted on groundwater elevation contour maps and updated in all future reports submitted for your site. Please address changes due to seasonal precipitation and groundwater pumping, and evaluate the potential interconnection between shallow and deep aquifers. Please include an analysis of vertical hydraulic gradients, and effects of pumping rates on hydraulic head from nearby water supply wells, if appropriate. Include hydraulic head in the different water bearing zones and hydrographs of all monitoring wells.

c. Release history, including potential source(s) of releases, potential contaminants of concern (COC) associated with each potential release, confirmed source locations, confirmed release locations, and existing delineation of release areas. Address primary leak source(s) (e.g., a tank, sump, pipeline, etc.) and secondary sources (e.g., high-

concentration contaminants in low-permeability lithologic soil units that sustain groundwater or vapor plumes). Include local and regional plan view maps that illustrate the location of sources (former facilities, piping, tanks, etc.).

d. Plume (soil gas and groundwater) development and dynamics including aging of source(s), phase distribution (NAPL, dissolved, vapor, residual), diving plumes, attenuation mechanisms, migration routes, preferential pathways (geologic and anthropogenic), magnitude of chemicals of concern and spatial and temporal changes in concentrations, and contaminant fate and transport. Please include three-dimensional plume maps for groundwater and two-dimensional soil vapor plume plan view maps to provide an accurate depiction of the contaminant distribution of each COC.

e. Summary tables of chemical concentrations in different media (i.e., soil, groundwater, and soil vapor). Please include applicable environmental screening levels on all tables. Include graphs of contaminant concentrations versus time.

f. Current and historic facility structures (e.g., buildings, drain systems, sewer systems, underground utilities, etc.) and physical features including topographical features (e.g., hills, gradients, surface vegetation, or pavement) and surface water features (e.g. routes of drainage ditches, links to water bodies). Please include current and historic site maps.

g. Current and historic site operations/processes (e.g., parts cleaning, chemical storage areas, manufacturing, etc.).

h. Other contaminant release sites in the vicinity of the site. Hydrogeologic and contaminant data from those sites may prove helpful in testing certain hypotheses for the SCM. Include a summary of work and technical findings from nearby release sites, including the two adjacent closed LUFT sites, (i.e., Montgomery Ward site and the Quest Laboratory site).

i. Land uses and exposure scenarios on the facility and adjacent properties. Include beneficial resources (e.g., groundwater classification, wetlands, natural resources, etc.), resource use locations (e.g., water supply wells, surface water intakes), subpopulation types and locations (e.g., schools, hospitals, day care centers, etc.), exposure scenarios (e.g. residential, industrial, recreational, farming), and exposure pathways, and potential threat to sensitive receptors. Include an analysis of the contaminant volatilization from the subsurface to indoor/outdoor air exposure route (i.e., vapor pathway). Please include copies of Sanborn maps and aerial photographs, as appropriate.

j. Identification and listing of specific data gaps that require further investigation during subsequent phases of work. Proposed activities to investigate and fill data gaps identified.

TABLE 1

INITIAL SITE CONCEPTUAL MODEL

CSM Element	CSM Sub-Element	Description	Data Gap	How to Address
Geology and Hydrogeology	Regional	The site is in the northwest portion of the Livermore Valley, which consists of a structural trough within the Diablo Range and contains the Livermore Valley Groundwater Basin (referred to as "the Basin") (DWR, 2006). Several faults traverse the Basin, which act as barriers to groundwater flow, as evidenced by large differences in water levels between the upgradient and downgradient sides of these faults (DWR, 2006). The Basin is divided into 12 groundwater basins, which are defined by faults and non-water-bearing geologic units (DWR, 1974). The hydrogeology of the Basin consists of a thick sequence of fresh-water-bearing continental deposits from alluvial fans, outwash plains, and lacustrine environments to up to approximately 5,000 feet bgs (DWR, 2006). Three defined fresh-water bearing geologic units exist within the Basin: Holocene Valley Fill (up to approximately 400 feet bgs in the central portion of the Basin), the Plio-Pleistocene Livermore Formation (generally between approximately 400 and 4,000 feet bgs in the central portion of the Basin), and the Pliocene Tassajara Formation (generally between approximately 250 and 5,000 or more feet bgs) (DWR, 1974). The Valley Fill units in the western portion of the Basin are capped by up to 40 feet of clay (DWR, 2006).	None	NA
	Site	***Geology:*** Borings advanced at the site indicate that subsurface materials consist primarily of finer-grained deposits (clay, sandy clay, silt and sandy silt) with interbedded sand lenses to 20 feet below ground surface (bgs), the approximate depth to which these borings were advanced. The documented lithology for one on-site boring that was logged to approximately 45 feet bgs indicates that beyond approximately 20 feet bgs, fine-grained soils are present to approximately 45 feet bgs. A cone penetrometer technology test indicated the presence of sandier lenses from approximately 45 to 58 feet bgs and even coarser materials (interbedded with finer-grained materials) from approximately 58 feet to 75 feet bgs, the total depth drilled. The lithology documented at the site is similar to that reported at other nearby sites, specifically the Montgomery Ward site (7575 Dublin Boulevard), the Quest laboratory site (6511 Golden Gate Drive), the Shell-branded Service Station site (11989 Dublin Boulevard), and the Chevron site (7007 San Ramon Road). ***Hydrogeology:*** Shallow groundwater has been encountered at depths of approximately 9 to 15 feet bgs. The hydraulic gradient and groundwater flow direction have not been specifically evaluated at the site.	As noted, most borings at the site have been advanced to approximately 20 feet bgs, and one boring has been advanced and logged to 45 feet bgs; CPT data was collected to 75 feet bgs at one location. Lithologic data will be obtained from additional borings that will be advanced on site to further the understanding of the subsurface, especially with respect to deeper lithology. The on-site shallow groundwater horizontal gradient has not been confirmed. Additionally, it is not known if there may be a vertical component to the hydraulic gradient.	Two direct push borings and four multi-port wells will be advanced to depth (up to approximately 75 feet bgs) and soil lithology will be logged. See items 4 and 5 on Table 2. Shallow and deeper groundwater monitoring wells will be installed to provide information on lateral and vertical gradients. See Items 2 and 5 on Table 2.
Surface Water Bodies		The closest surface water bodies are culverted creeks. Martin Canyon Creek flows from a gully west of the site, enters a culvert north of the site, and then bends to the south, passing approximately 1,000 feet east of the site before flowing into the Alamo Canal. Dublin Creek flows from a gully west of the site, enters a culvert approximately 750 feet south of the site, and then joins Martin Canyon Creek approximately 750 feet southeast of the site.	None	NA
Nearby Wells		The State Water Resources Control Board's GeoTracker GAMA website includes information regarding the approximate locations of water supply wells in California. In the vicinity of the site, the closest water supply wells presented on this website are depicted approximately 2 miles southeast of the site; the locations shown are approximate (within 1 mile of actual location for California Department of Public Health supply wells and 0.5 mile for other supply wells). No water-producing wells were identified within 1/4 mile of the site in the well survey conducted for the Quest Laboratory site (6511 Golden Gate Drive; documented in 2009); information documented in a 2005 report for the Chevron site at 7007 San Ramon Road indicates that a water-producing well may exist within 1/2 mile of the site.	A formal well survey is needed to identify water-producing, monitoring, cathodic protection, and dewatering wells.	Obtain data regarding nearby, permitted wells from the California Department of Water Resources and Zone 7 Water Agency (Item 11 on Table 2).

TABLE 2

DATA GAPS AND PROPOSED INVESTIGATION

Item	Data Gap	Proposed Investigation	Rationale	Analysis
5	Evaluate the possible presence of impacts to deeper groundwater. Evaluate deeper groundwater concentration trends over time. Obtain data regarding the vertical groundwater gradient. Obtain more lithological data below 20 feet bgs.	Install four continuous multichannel tubing (CMT) groundwater monitoring wells (aka multi-port wells) to approximately 65 feet bgs in the northern parking lot with ports at three depths (monitoring well locations may be adjusted pending results of shallow grab groundwater samples; we will discuss any potential changes with ACEH before proceeding). Groundwater monitoring frequency to be determined. Soil samples will be collected only if there are field indications of impacts. Soil lithology will be logged. However, information regarding the moisture content of soil may not be reliable using sonic drilling technology (two borings will be logged using direct push technology; see Item 4, above).	One well is proposed at the western (upgradient) property boundary to confirm that there are no deeper groundwater impacts from upgradient. Two wells are proposed near the center of the northern parking lot to evaluate potential impacts in an area where deeper impacts, if any, would most likely to be found. One well is proposed at the eastern (downgradient) property boundary to confirm that there are no impacts extending off-site. Port depths will be chosen based on the locations of saturated soils (as logged in direct push borings; see Item 4, above), but are expected at approximately 15, 45, and 60 feet bgs.	*Groundwater:* VOCs by EPA Method 8260, dissolved oxygen, oxidation/reduction potential, temperature, pH, and specific conductance.
6	Evaluate possible off-site migration of impacted soil vapor in the downgradient direction (east). Evaluate concentration trends over time.	Install 4 temporary nested soil vapor probes at approximately 4 and 8 feet bgs along the eastern property boundary. Based on the results of the sampling, two sets of nested probes will be converted to vapor monitoring wells to allow for evaluation of VOC concentration trends over time.	Available data indicate that PCE and TCE are present in soil vapor in the eastern portion of the northern parking lot. Samples are proposed on approximately 50-foot intervals along the eastern property boundary to provide a transect of concentrations through the vapor plume. The depths of 4 and 8 feet bgs are chosen to provide data closest to the source (i.e., groundwater) while avoiding saturated soil, and also provide shallower data to help evaluate potential attenuation within the soil column. Two sets of nested vapor probes will be converted into vapor monitoring wells (by installing well boxes at ground surface); the locations of the permanent wells will be chosen based on the results of samples from the temporary probes.	*Soil vapor* : VOCs by EPA Method TO-15.
7	Evaluate potential for off-site migration of impacted groundwater in the downgradient direction (east).	Advance two borings to approximately 20 feet bgs in the parking lot of the property east of the Crown site for collection of grab groundwater samples.	Two borings are proposed off-site, on the property east of the Crown site, just east of the building in the expected area of highest potential VOC concentrations.	*Groundwater:* VOCs by EPA Method 8260, dissolved oxygen, oxidation/reduction potential, temperature, pH, and specific conductance.
8	Evaluate VOC concentrations just north of the highest concentration area.	Advance two borings to approximately 20 feet bgs north of Building A for collection of soil and grab groundwater samples. Soil samples will be collected at two depths in the vadose zone. Soil samples will be collected based on field indications of impacts (PID readings, odor, staining) or, in the absence of field indications of impacts, at 5 and 10 feet bgs.	The highest concentrations of PCE in groundwater were detected at boring NM-B-32, just north of Building A. The nearest available data to the north are approximately 75 feet away. One of the borings will be advanced approximately 20 feet north of NM-B-32 to provide data close to the highest concentration area. A second boring will be advanced approximately halfway between the first boring and former boring NM-B-33 to provide additional spatial data for contouring purposes. These borings will be part of a transect in the highest concentration area.	*Groundwater:* VOCs by EPA Method 8260, dissolved oxygen, oxidation/reduction potential, temperature, pH, and specific conductance. *Soil:* VOCs by EPA Method 8260 (soil samples to be collected using field preservation in accordance with EPA Method 5035).
9	Evaluate VOC concentrations in soil vapor in the south parcel of the site.	Install four temporary soil vapor probes at approximately 5 feet bgs around boring SV-25, where PCE was detected in soil vapor at a low concentration.	PCE was detected in soil vapor sample SV-25 in the southern parcel, although was not detected in groundwater in that area. Three probes will be installed approximately 30 feet from of boring SV-25 to attempt to delineate the extent of impacts. A fourth probe is proposed west of the original sample, close to the property boundary and the location of mapped utility lines, which may be a potential conduit, to evaluate potential impacts from the west.	*Soil vapor* : VOCs by EPA Method TO-15.
10	Obtain additional information regarding subsurface structures and utilities to further evaluate migration pathways and sources.	Ground penetrating radar (GPR) and other utility locating methodologies will be used, as appropriate, to further evaluate the presence of unknown utilities and structures at the site.	Utilities have been identified at the site that include an on-site sewer lateral and drain line, and shallow water, electric, and gas lines. Given the current understanding of the distribution of PCE in groundwater at the site, it is possible that other subsurface utilities, and specifically sewer laterals, exist that may act as a source or migration pathway for distribution of VOCs in the subsurface.	NA

APPENDIX B

Standard Operating Procedures

STANDARD OPERATING PROCEDURE – DIRECT PUSH BORINGS

SOIL CORING AND SAMPLING PROCEDURES

Prior to drilling, all boreholes will be hand dug to a depth of 4-5 feet below ground surface (bgs) to check for underground utilities.

Soil and groundwater samples are collected for lithologic and chemical analyses using a direct driven soil coring system. A hydraulic hammer drives sampling rods into the ground to collect continuous soil cores. As the rods are advanced, soil is driven into an approximately 2.5-inch-diamter sample barrel that is attached to the end of the rods. Soil samples are collected in sleeves inside the sample barrel as the rods are advanced. After being driven 4 to 5 feet into the ground, the rods are removed from the borehole. The sleeve containing the soil core is removed from the sample barrel, and can then be preserved for chemical analyses, or used for lithologic description. This process is repeated until the desired depth or instrument refusal is reached.

A soil core interval selected for analyses is cut from the sleeve using a pre-cleaned hacksaw. The ends of the tube are covered with aluminum foil or Teflon liner and sealed with plastic caps. The soil-filled liner is labeled with the bore number, sample depth, site location, date, and time. The samples are placed in bags and stored in a cooler containing ice. Soil from the core adjacent to the interval selected for analyses is placed in a plastic zip-top bag. The soil is allowed to volatilize for a period of time, depending on the ambient temperature. The soil is scanned with a flame-ionization detector (FID) or photo-ionization detector (PID).

All sample barrels, rods, and tools (e.g. hacksaw) are cleaned with Alconox or equivalent detergent and de-ionized water. All rinsate from the cleaning is contained in 55-gallon drums at the project site.

GROUNDWATER SAMPLING FROM DIRECT PUSH BORINGS

After the targeted water-bearing zone has been penetrated, the soil-sample barrel is removed from the borehole. Small-diameter well casing with 0.010-inch slotted well screen may be installed in the borehole to facilitate the collection of groundwater samples. Threaded sections of PVC are lowered into the borehole. Groundwater samples may then be collected with a bailer, peristaltic pump, submersible or other appropriate pump until adequate sample volume is obtained. Perstaltic pumps are not used in applications requiring a lift of greater than 1 foot of net head.

Groundwater samples are preserved, stored in an ice-filled cooler, and are delivered, under chain-of-custody, to a laboratory certified by the California Department of Health Services (DHS) for hazardous materials analysis.

BOREHOLE GROUTING FOR DIRECT PUSH BORINGS

Upon completion of soil and water sampling, boreholes will be abandoned with neat cement grout to the surface. If the borehole was advanced into groundwater, the grout is pumped through a grouting tube positioned at the bottom of the borehole.