Alameda County Health Care Services Agency

1131 Harbor Bay Pkwy, Suite 250

Alameda, CA 94502

Subject: RO#00003159

Roofing Facility

745 Kevin Court

Oakland, CA 94621

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

Sincerely,

Robert A Elliott Jr

Robert A. Elliott

Aqua Science Engineers, Inc. 55 Oak Court, Suite 220, Danville, CA 94526
(925) 820-9391 - Fax (925) 837-4853 - www.aquascienceengineers.com

November 6, 2015

REVISED
WORKPLAN
For a
SOIL, GROUNDWATER and SOIL VAPOR ASSESSMENT
RO3159_WP_R_2015-11-06
at
Roofing Facility
745 Kevin Court
Oakland, CA 94621

ASE Job Number 4641

Submitted by:
AQUA SCIENCE ENGINEERS, INC.
55 Oak Court, Suite 220
Danville, CA 94526
(925) 820-9391

Aqua Science Engineers, Inc. 55 Oak Court, Suite 220, Danville, CA 94526
(925) 820-9391 - Fax (925) 837-4853 - www.aquascienceengineers.com

1.0 INTRODUCTION

This submittal presents Aqua Science Engineer's, Inc. (ASE) workplan for a soil, groundwater and soil vapor assessment at 745 Kevin Court in Oakland, California (Figures 1). The proposed site assessment activities were initiated by Mr. Robert Elliott c/o Mr. Mark Elliott, the owner of the property and responsible party, as requested by the Alameda County Health Care Services Agency (ACHCSA) in their directive letter dated April 14, 2015.

2.0 BACKGROUND

The subject property has been owned by our clients, the Elliotts, since the mid 1970's and used by their family as a roofing company warehouse and yard. At the time of the property purchase, the buildings along the western property line and a 1,000 gallon underground storage tank (UST) already existed at the site. The Elliotts built the building on the eastern side of the property some time later.

A Phase I Environmental Site Assessement was completed for the subject site by ERAS Environmental in October 2014. During the Phase I, files from the ACHCSA and the Oakland Fire Department (OFD) were reviewed, and records were noted that a 1,000 gallon UST that held motor-vehicle fuel (gasoline) was located at the site, and removed in 1991 (by the Elliotts). The files were not complete – items regarding UST use permits and the UST removal report were missing. No files indicating soil or water sampling at the time of the UST's removal were found in the files.

In November 2014, AEI Consultants performed a Phase II Site Assessment at the subject site that included the installation of four shallow soil borings within and surrounding the former UST location for the collection of grab groundwater samples. Total petroleum hydrocarbons as gasoline (TPH-G), benzene, and toluene were identified in groundwater samples collected from three of the four grab water samples. The highest concentrations were identified in soil boring HP-2, located just north of the former UST, and included 6,200 parts per billion (ppb) TPH-G, 73 ppb benzene, and 12 ppb toluene. AEI concluded that the findings of their 2014 investigation indicated that gasoline-impacted soil exists in the area of the former UST, which appears to be acting as the source of groundwater impacts.

The April 14, 2015 directive letter from the ACHCSA makes three requests. These requests are as follows:

2.1 Request for a Site Investigation Workplan and Site Conceptual Model (SCM)

ASE has prepared a SCM for the subject site, see Appendix A. ASE has prepared this workplan to fill-in data gaps identified in the SCM and to satisfy the requirements within the ACHCSA's directive letter.

2.2 GeoTracker Compliance

ASE has become the Authorized RP Agent for the site within GeoTracker. ASE has uploaded the ERAS 2014 Phase I, the AEI 2014 Phase II and this workplan to GeoTracker.

2.3 Preparation of a List of Landowners Form

The requested form has been uploaded to the ACHCSA ftp site.

3.0 PROPOSED SCOPE OF WORK

The purpose of this assessment is to provide additional data to be used to determine whether the site may be closed as a low threat case under the new California Regional Water Quality Control Board, San Francisco Bay Region Low-Threat Closure Policy. This workplan has been designed to fill-in data gaps identified in the SCM and fulfill requirements set forth in the ACHCSA directive letter.

The scope of work for this project is separated into two tasks: Task-A, investigate for the possible presence of light non-aqueous phase liquids (LNAPL), and Task-B, perform the remaining tasks necessary to comply with the ACHCSA's April 14 2015 directive letter, and fill-in the remaining data gaps identified within the SCM. The specific proposed scope of work is as follows:

TASK – A INVESTIGATE FOR THE POSSIBLE PRESENCE OF LNAPL

The proposed scope of work detailed below is meant to satisfy one of the requests made by the ACHCSA in their April 14, 2015 directive letter, Item 1d, which is to determine if LNAPL or free-floating hydrocarbons exist in the area of the former UST. This scope of work also addresses Data Gap Item #4, see Appendix A.

ASE, the responsible party, and the current on-site tenant request that prior to performing any additional traditional assessment activities (soil borings, monitoring wells), an excavation is created within the former UST pit to determine if LNAPL exists in the area of the former UST. All parties request this initial plan because (a) the on-site tenant is a licensed hazardous waste contractor with heavy equipment and trained personnel on-site that can perform the excavation activities for a very low cost, (b) this will allow for a chance to perform source removal (removal of contaminated soil and potentially contaminated groundwater/free-product) using their on-site equipment and vacuum trucks, (c) this will eliminate the possibility of having to destroy a monitoring well in the middle of the former UST excavation should remediation by excavation be required at a later date, and (d) if LNAPL is not evident within the excavation, then permanent monitoring wells may not be required in the future. The scope of work is as follows:

1) Notify Underground Service Alert (USA) of the excavation and have the area cleared of subsurface utility lines by a private subsurface utility line locating company.

2) Using an excavator, excavate an 8-foot wide by 8-foot long by 10-foot deep excavation directly through the area of the former UST, see Figure 2.

3) Stockpile excavated soil on-site on top of plastic sheeting, covered by plastic sheeting. It is estimated that approximately 25 cubic yards of soil will be excavated.

4) Remove groundwater from within the excavation as overexcavation activities continue to allow for visual inspection of the excavation bottom and sidewalls. This task will be performed using a vacuum truck.

5) Place any removed groundwater into an on-site holding tank for future handling.

6) Collect excavation sidewall soil samples once the desired depth is reached.

7) Collect a grab groundwater sample from the excavation once groundwater has been allowed to flow into excavation.

8) Analyze the excavation sidewall soil samples and grab groundwater sample at a CAL-EPA certified analytical laboratory for total petroleum hydrocarbons as diesel (TPH-D) by modified Method 8015 (both with and without a silica-gel cleanup) and total petroleum hydrocarbons as gasoline (TPH-G), benzene, toluene, ethyl benzene, and total xylenes (collectively known as BTEX), plus naphthalene and fuel oxygenates by EPA Method 8260B.

9) Collect a composite soil sample from the stockpiled soil for purposes of profiling the soil into an appropriate landfill.

10) Analyze the stockpiled soil sample at a CAL-EPA certified analytical laboratory for TPH-D by modified Method 8015 and TPH-G, BTEX, plus naphthalene and fuel oxygenates by EPA Method 8260B.

11) Place a steel plate over the excavation for a period of up to 30 days.

12) On a weekly basis, remove the steel plate to allow for visual inspection of the groundwater within the excavation. If free-floating hydrocarbons are present, it will be noted, and the thickness will be measured using an interface probe and product bailer.

13) If free-floating hydrocarbons are present, they will be skimmed from the top of the water table using a vacuum truck, and the product will be placed within 55-gallon drums for future off-site disposal. This process will continue until free-floating hydrocarbons are no longer present or 30 days have elapsed, whichever comes first. ASE will then determine an appropriate course of action.

14) Properly dispose of any soil, groundwater or free-floating hydrocarbons that are generated during this process.

15) Prepare a report of the findings of the work detailed above.

TASK A1 NOTIFY USA TO CLEAR DRILLING LOCATIONS OF UNDERGROUND UTILITY LINES

ASE will mark the proposed boring locations with white paint and will notify Underground Service Alert (USA) to have underground utility lines marked in the site vicinity at least 48-hours prior to drilling. ASE will also contract with a private underground utility locating company to clear each drilling locations of underground lines prior to drilling.

TASK A2 CREATE AN EXCAVATION IN THE AREA OF THE FORMER UST

Using an excavator supplied by the current tenant, create an excavation that is 8-feet wide, by 8-feet long, and up to 10-feet deep in the area of the former UST. The purpose of this excavation is two-fold, (a) to allow for source removal of contaminated soil within the former UST pit, and (b) create an excavation, a void, at the groundwater level to determine if free-floating hydrocarbons will accumulate on the groundwater within the excavation.

TASK A3 STOCKPILE THE EXCAVATED SOIL

Soil that is removed from the excavation will be stockpiled on-site, placed on top of and be covered by plastic sheeting. Any soil that appears too wet for stockpiling will be placed within water-tight bins that currently exist at the site (owned by the current tenant).

TASKS A4 & A5 REMOVE GROUNDWATER FROM THE PIT AS EXCAVATION ACTIVITIES OCCUR

Using a vacuum truck supplied by the current tenant, groundwater will be removed from the pit as excavation activities occur. This will allow for visual inspection of the excavation sidewalls and bottom. A depth of 10-feet is planned for the excavation. This depth is assumed to be approximately 3-feet deeper than the bottom of the former UST.

The removed groundwater will then be pumped into an on-site holding tank for later handling.

TASK A6 COLLECT SOIL SAMPLES FROM THE EXCAVATION

Soil samples will be collected from each sidewall at a depth equal to the assumed capillary fringe, and deeper if soil coloration or hydrocarbon odors appear different from the capillary fringe depth. Since the excavation will likely be fully-saturated at the bottom, no bottom of excavation soil samples are anticipated. Soil samples will be collected into brass sample containers directly from the excavator bucket. Samples will be trimmed, sealed with Teflon tape

and plastic caps, labeled with the site location, sample designation, date and time the sample was collected, and the initials of the person collecting the sample. The samples will be placed into an ice chest containing wet ice for delivery under chain of custody to a CAL-DHS certified analytical laboratory.

Additional soil from the excavation will be removed for hydrogeologic description and will be screened for volatile compounds with a photoionization detector (PID). The soil will be screened by emptying soil from one of the tubes into a plastic bag. The bag will be sealed and placed in the sun for approximately 10 minutes. After the hydrocarbons have been allowed to volatilize, the PID will measure the vapor through a small hole, punched in the bag. These PID readings will be used as a screening tool only since these procedures are not as rigorous as those used in an analytical laboratory.

TASK A7 COLLECT A GRAB GROUNDWATER SAMPLE FROM THE EXCAVATION

Once soil excavation activities are completed, and groundwater has re-appeared in the excavation, ASE will collect a grab groundwater sample for analysis. Prior to sampling, the groundwater surface in the pit will be checked for a sheen or free-floating hydrocarbons. This task assumes that free-floating hydrocarbons are not present at the time of sampling. The groundwater sample will be collected using a disposable polyethylene bailer. Groundwater samples will be decanted from the bailer into 40-ml glass volatile organic analysis (VOA) vials, preserved with hydrochloric acid, and sealed without headspace. The samples will then be labeled with the site location, sample designation, date and time the samples were collected, and the initials of the person collecting the samples. The samples will be placed into an ice chest with wet ice for transport to the analytical laboratory under chain of custody.

TASK A8 ANALYZE THE SOIL AND GROUNDWATER SAMPLES

The soil and groundwater samples detailed above will be analyzed at a CAL-EPA certified analytical laboratory for TPH-D by modified Method 8015 (both with and without a silica-gel cleanup), and TPH-G, BTEX, plus naphthalene and fuel oxygenates by EPA Method 8260B. Soil samples analyzed will include a sample collected from the capillary zone, as well as additional samples if there is any indication of contamination based on odors, staining or PID readings.

TASKS A9 & A10 COLLECT AND ANALYZE THE STOCKPILED SOIL SAMPLES

Soil samples will be collected from the stockpiled soil and composited prior to being analyzed at a CAL-EPA certified analytical laboratory for TPH-D by modified Method 8015, and TPH-G, BTEX, plus naphthalene and fuel oxygenates by EPA Method 8260B. The data will be used to profile the soil into an appropriate landfill facility.

TASKS A11, A12 & A13 CHECK SURFACE OF PIT WATER FOR FREE-FLOATING HYDROCARBONS

A steel plate will be set over the excavation for a period of approximately 30 days. On a weekly basis, the plate will be moved so that the surface of the pit waster can be inspected for free-floating hydrocarbons. If no free-floating hydrocarbons are observed, the plate will be returned over the excavation. However, if free-floating hydrocarbons are observed, it will be noted and the product thickness will be measured with an interface probe and/or a product bailer. The free-floating hydrocarbons will then be skimmed off the surface of the groundwater using an on-site vacuum truck until no free-floating hydrocarbons remain. This process will continue weekly for a period of approximately 30 days. After the 30 days, ASE will prepare a letter report detailing the findings of the 30-day experiment for the review of the ACHCSA. The letter will provide recommendations for the next step based on the findings.

Hypothetically, if free-floating hydrocarbons are not observed over the 30 day period, ASE will recommend the excavation be backfilled with clean, imported material and resurfaced. If free-floating hydrocarbons did exist, were skimmed from the surface, and did not return, then ASE will recommend the same. However, if free-floating hydrocarbons exist, and repeated skimming doesn't eliminate the free-floating hydrocarbons, then ASE will likely recommend additional remedial activities to eliminate the free-floating hydrocarbons.

TASK A14 DISPOSE OF POLLUTED SOIL, GROUNDWATER AND FREE-FLOATING HYDROCARBONS, AS NECESSARY

ASE will arrange for the proper disposal of the stockpiled soil and extracted groundwater that will be generated during the excavation activities. If free-product is found and skimmed off the water table, it too will be disposed of at a local recycling facility. ASE will include all manifests of the wastes disposed in our final report of remedial activities.

TASK A15 PREPARE A REPORT

ASE will prepare a report presenting the methods and findings of this assessment/remedial effort. The report will be submitted under the seal of state registered civil engineer or geologist. This report will include a summary of all work completed during this project including tabulated analytical results, conclusions and recommendations. Copies of the analytical report and chain of custody will be included as appendices. The report, analytical data, and drawings will also be uploaded to the state Geotracker database.

TASK – B FILL-IN DATA GAPS DETAILED IN SCM

1) Obtain a drilling permit from the Alameda County Public Works Agency.

2) Notify Underground Service Alert (USA) of the drilling and have drilling locations cleared of subsurface utility lines by a private subsurface utility line locating company.

3) Drill two (2) soil borings at the site to a depth of no greater than 20-feet below ground surface (bgs) using a track-mounted direct push drill rig and collect soil and groundwater samples for analysis, see Figure 3. A geologist will log the soil and will field screen soil for possible contamination using a portable photoionization detector (PID).

4) Analyze one soil and one groundwater sample from each boring at a CAL-EPA certified analytical laboratory for total petroleum hydrocarbons as diesel (TPH-D) by modified Method 8015 (both with and without a silica-gel cleanup) and total petroleum hydrocarbons as gasoline (TPH-G), benzene, toluene, ethyl benzene, and total xylenes (collectively known as BTEX), plus naphthalene and fuel oxygenates by EPA Method 8260B.

5) Collect soil vapor samples from two locations west of the former UST, see Figure 3.

6) Analyze the soil vapor sample from each boring at a CAL-EPA certified analytical laboratory for TPH-G and BTEX by EPA Method TO-15, and carbon dioxide, oxygen, methane, and helium by ASTM D1946.

7) Backfill each boring with neat cement.

8) Properly dispose of drummed drill cuttings and waste-water produced during well purging and steam-cleaning of drilling equipment in an off-site facility.

9) Prepare a report presenting the methods and findings of this assessment.

Details of the assessment are presented below.

TASK B1 OBTAIN NECESSARY PERMITS

Prior to drilling, ASE will obtain a drilling permit from the Alameda County Public Works Agency.

TASK B2 NOTIFY USA TO CLEAR DRILLING LOCATIONS OF UNDERGROUND UTILITY LINES

ASE will mark the proposed boring locations with white paint and will notify Underground Service Alert (USA) to have underground utility lines marked in the site vicinity at least 48-

hours prior to drilling. ASE will also contract with a private underground utility locating company to clear each drilling locations of underground lines prior to drilling.

TASK B3 DRILL TWO SOIL BORINGS AND COLLECT SOIL AND GROUNDWATER SAMPLES FOR ANALYSIS

ASE will drill two soil borings at the site to a depth of approximately 20-feet bgs at the locations shown on Figure 3. One boring will be drilled west of the former UST pit, within the area currently used as a shop, and the second boring will be drilled north of former AEI soil boring HP-2. These borings will be used to assess petroleum hydrocarbon levels in soil and groundwater in the presumed downgradient direction of the former UST pit (PENSKE Stantec 2014 groundwater flow direction west-northwest).

The borings will be drilled using a Geoprobe direct-push drilling rig. A qualified ASE geologist will direct the drilling. Undisturbed soil samples will be collected continuously for subsurface hydrogeologic description and possible chemical analysis. The soil will be described by the ASE geologist according to the Unified Soil Classification System (USCS). The samples will be collected in acetate tubes using a drive sampler advanced as the boring progresses. One soil sample will be collected from the capillary zone in each boring and will be prepared for analysis. Additional samples will be collected if there is any indication of contamination based on visual inspection, odors or other evidence. The sample prepared for analysis will be immediately removed from the sampler, cut at the appropriate sample interval, trimmed, and sealed with Teflon tape and plastic caps. The samples will then be labeled with the site location, sample designation, date and time the sample was collected, and the initials of the person collecting the sample. The samples will be placed into an ice chest containing wet ice for delivery under chain of custody to a CAL-EPA certified analytical laboratory.

Soil from the remaining tubes not sealed for analysis will be removed for hydrogeologic description and will be screened for volatile compounds with a photoionization detector (PID). The soil will be screened by emptying soil into a plastic bag. The bag will be sealed and placed in the sun for approximately 10 minutes. After the hydrocarbons have been allowed to volatilize, the PID will measure the vapor through a small hole, punched in the bag. These PID readings will be used as a screening tool only since these procedures are not as rigorous as those used in an analytical laboratory.

Once groundwater is encountered, temporary PVC casing will be placed into the boring to allow for the collection of groundwater samples. The PVC casing will be slotted for at least the entire saturated interval. The presence of LNAPL will be determined in each borehole using a new, disposable bailer. If present, the thickness will be measured and noted. A sample of the LNAPL will also be collected. If LNAPL is not found, then grab groundwater samples will be collected. Water samples will then be collected using a bailer. Water will be decanted from the bailer into 40-ml volatile organic analysis (VOA) vials pre-preserved with hydrochloric acid, sealed without headspace, labeled, and placed into an ice chest with wet ice for transport to the analytical laboratory under chain of custody.

All sampling equipment will be cleaned in buckets with brushes and an Alconox solution, and then rinsed twice with tap water. Rinsates will be contained on-site in 55-gallon steel drums for future disposal.

TASK B4 ANALYZE SOIL AND GROUNDWATER SAMPLES

At least one soil sample from each boring, as well as each groundwater sample, will be analyzed at a CAL-EPA certified analytical laboratory for TPH-D by modified Method 8015 (both with and without a silica-gel cleanup), and TPH-G, BTEX, plus naphthalene and fuel oxygenates by EPA Method 8260B. Soil samples analyzed will include a sample collected from the capillary zone, as well as additional samples if there is any indication of contamination based on odors, staining or PID readings.

TASK B5 COLLECT SOIL VAPOR SAMPLES FROM TWO LOCATIONS

Prior to conducting the project, ASE will verify that there has been no significant rainfall (no more than 1/2-inch) for 5 days prior to the soil vapor sampling.

ASE will push two vapor points to 5-feet bgs using drilling rods driven with a Geoprobe in locations shown of Figure 3. The bottom of each rod will contain an expendable point. Once at depth, ¼" Teflon tubing with a 1-inch screen will be inserted inside the drive rod. The drive rod will be retracted approximately 6-inches separating the expendable point and the rods and creating the desired void for the sample collection Membrane. Sand will be added to fill the void to 6-inches above the sample point. Above the sand, 6-inches of dry granulated bentonite will be added followed by hydrated bentonite to the surface to prevent ambient air intrusion into the borehole.

The borehole will then be allowed to equilibrate 2 hours prior to purging and sampling. A "vacuum shut in test" will then be conducted to verify there are no leaks in the sample train system. A minimum vacuum of 100-inches of water column will be applied to the sampling manifold and valves system between the Summa canister and the probe for at least 5 minutes with all valves closed. If a vacuum of 100-inches of water is not maintained, then the tubing and valves will be adjusted or changed until the vacuum holds for the length of the test.

For the sampling, the sampling probe and Summa canister will be placed into a plastic shroud. Helium will then be added to the shroud as a tracer gas at a minimum concentration of 20% by volume. The tubing will then be purged of at least three volumes to insure that all ambient air is removed from the tubing using a 5-litre Summa purge canister.

The sample will be collected in a 1-liter Summa canister with a rate between 100 to 200-ml per minute and at a vacuum of less than 100-inches of water. The samples will be labeled with the site location, sample designation, date and time the samples are collected, and the initials of the person collecting the sample. The samples will then be delivered under chain of custody to a CAL-EPA certified analytical laboratory for analysis.

All disposable equipment and supplies will be discarded and non-disposable equipment will be cleaned with an Alconox solution and triple rinsed between sampling locations.

TASK B6 ANALYZE THE SOIL VAPOR SAMPLES

Each vapor sample will be analyzed at a CAL-EPA certified analytical laboratory for TPH-G and BTEX by EPA Method TO-15, and carbon dioxide, oxygen, methane and helium by ASTM D1946.

TASK B7 BACKFILL THE BORINGS WITH NEAT CEMENT

Following collection of the soil, groundwater and vapor samples, the boreholes will be backfilled with neat cement placed by tremie pipe.

TASK B8 DISPOSE OF DRILL CUTTINGS AND WASTE WATER PRODUCED DURING THIS ASSESSMENT

ASE will arrange for the proper disposal of drummed drill cuttings produced during the installation of the groundwater monitoring wells. In addition, drummed waste-water produced during well purging for development and sampling, was well as waste-water from the steam-cleaning of drilling equipment will be properly profiled and disposed of off-site.

TASK B9 PREPARE A REPORT

ASE will prepare a report presenting the methods and findings of this assessment. The report will be submitted under the seal of state registered civil engineer or geologist. This report will include a summary of all work completed during this assessment including tabulated analytical results, conclusions and recommendations. Copies of the analytical report and chain of custody will be included as appendices. The report, analytical data, and boring logs will also be uploaded to the state Geotracker database.

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4.0 SCHEDULE

ASE will schedule field activities immediately upon approval of this workplan by the ACHCSA. The first order of business will be to complete Task A, which is perform an excavation for source removal and investigate for possible LNAPL. Task B will begin upon completion of the report submittal of Task A. The ACHCSA will be notified in writing of the proposed field activities so that a representative from the ACHCSA may visit the site if desired during field work.

Should you have any questions or comments, please call us at (925) 820-9391.

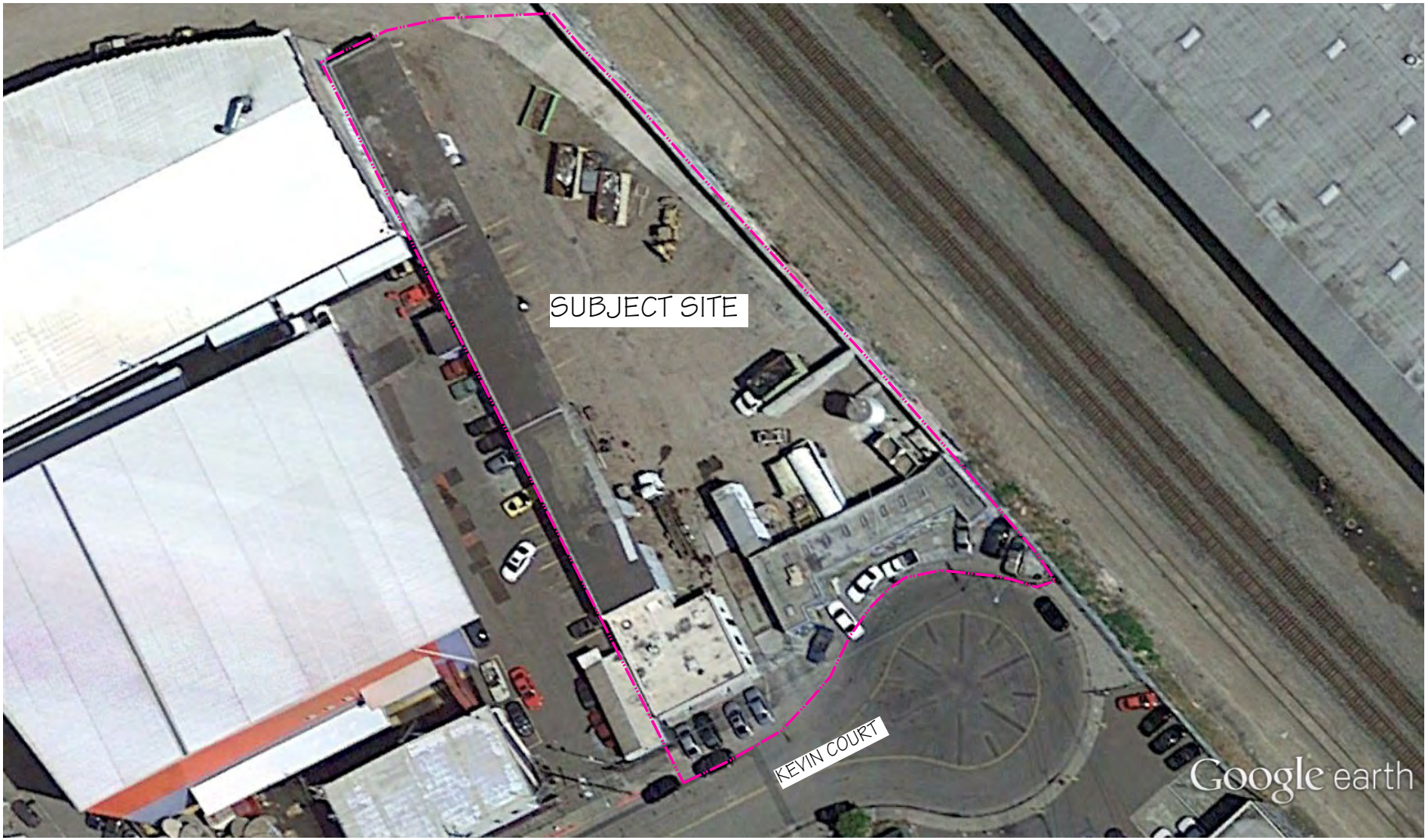
Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.

Robert E. Kitay, P.G.
Senior Geologist

Aqua Science Engineers, Inc. 55 Oak Court, Suite 220, Danville, CA 94526
(925) 820-9391 - Fax (925) 837-4853 - www.aquascienceengineers.com

FIGURES



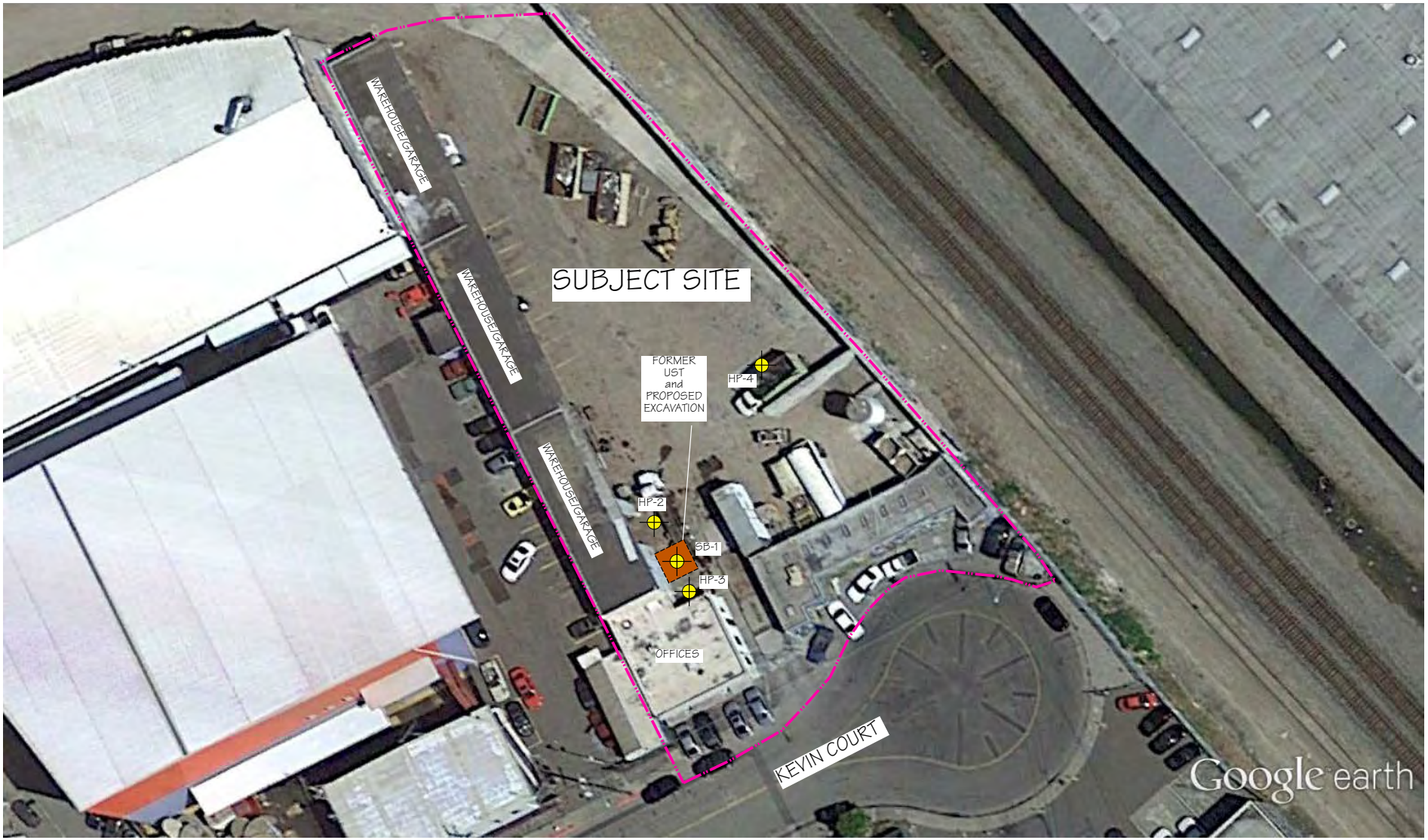
NORTH

NOT TO SCALE

SITE LOCATION MAP

Elliott Property
745 Kevin Court
Oakland, California

Aqua Science Engineers	Figure 1



NORTH

NOT TO SCALE

LEGEND

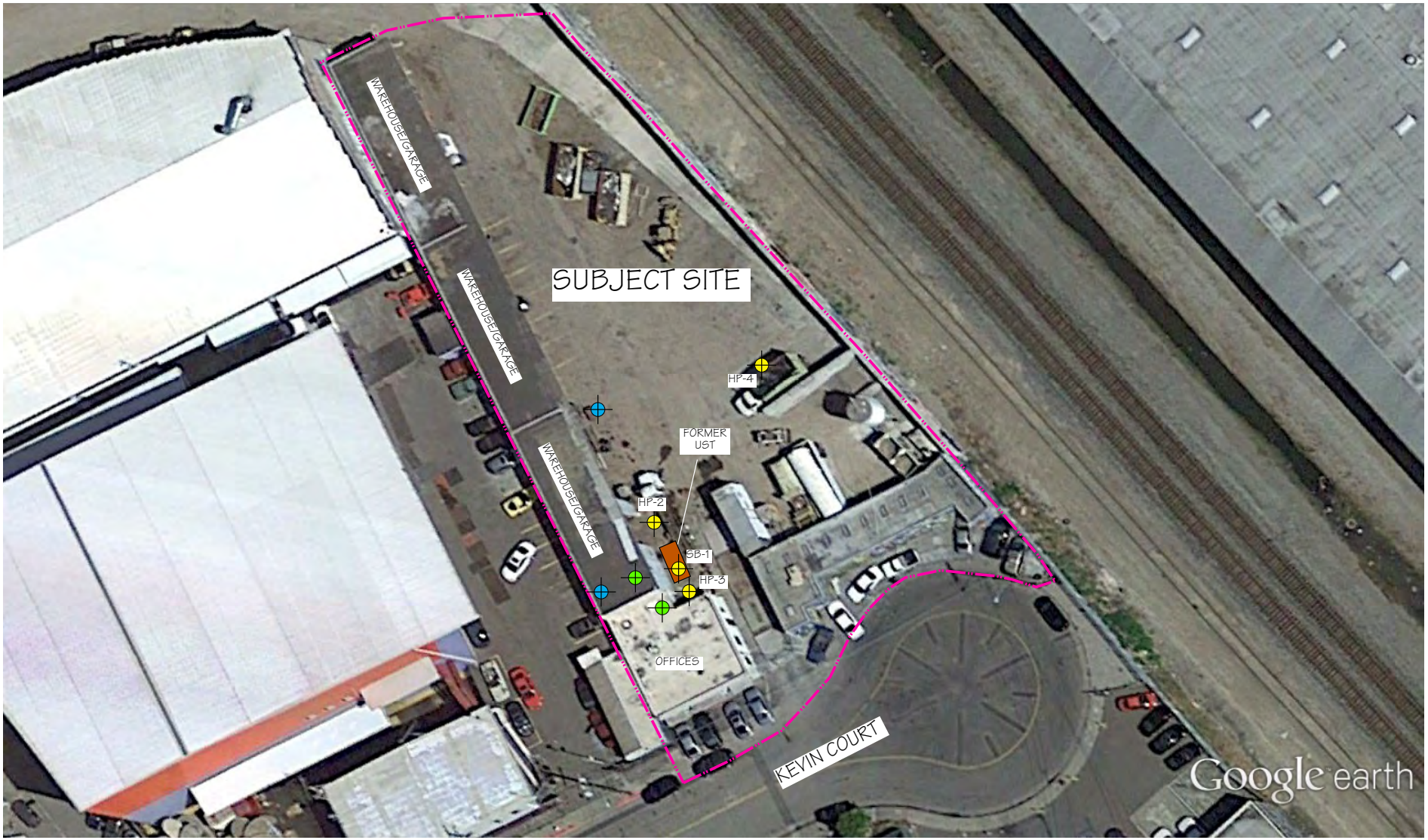
PREVIOUS SOIL BORING LOCATION, DRILLED BY AEI CONSULTANTS IN NOVEMBER 2014

LOCATION OF FORMER UST, AND LOCATION OF PROPOSED EXCAVATION FOR FREE-FLOATING HYDROCARBON INVESTIGATION

SITE LOCATION AND PROPOSED EXCAVATION MAP

Elliott Property
745 Kevin Court
Oakland, California

Aqua Science Engineers | Figure 2



NORTH

NOT TO SCALE

LEGEND

- PREVIOUS SOIL BORING LOCATION, DRILLED BY AEI CONSULTANTS IN NOVEMBER 2014
- PROPOSED SOIL BORING LOCATION FOR THE COLLECTION OF SOIL AND GROUNDWATER SAMPLES
- PROPOSED SOIL VAPOR BORING LOCATION

PROPOSED SOIL BORING LOCATION MAP

Elliott Property
745 Kevin Court
Oakland, California

Aqua Science Engineers | Figure 3

Aqua Science Engineers, Inc. 55 Oak Court, Suite 220, Danville, CA 94526
(925) 820-9391 - Fax (925) 837-4853 - www.aquascienceengineers.com

APPENDIX A

SITE CONCEPTUAL MODEL

Table 1
Site Conceptual Model

SCM Element	SCM Sub-Element	Description	Data Gap Item #	Resolution
Geology and Hydrogeology	Site	As described by AEI in their November 2014 Phase II, the lithology encountered in the subsurface beneath the Site during drilling activities consisted of silty fill and manmade material to a depth of 6.5 feet below ground surface (bgs). This material was underlain by a high plasticity clay unit which appeared to represent native sediments. It should be noted that the only boring log within the AEI report was for the soil boring drilled directly through the former UST pit. Unfortunately, there are no additional descriptors within the report for the other soil borings drilled at the site by AEI. Groundwater was encountered in direct-push boreholes at depths ranging from 3.7 to 4.6 feet bgs. This groundwater depth is not considered a stabilized groundwater depth, because it was not measured from appropriately constructed monitoring wells.	1	Any additional soil borings to be drilled at the site will be logged by a Professional Geologist, and the report shall include boring logs.

Table 1
Site Conceptual Model (Continued)

SCM Element	SCM Sub-Element	Description	Data Gap Item #	Resolution
Geology and Hydrogeology	Regional	Regional groundwater in the Oakland area generally follows topography, from areas of higher elevation in the east toward lower elevation in the west and southwest. The groundwater flow direction in the vicinity of the Site is to the west-northwest towards San Francisco Bay (PENSKE Stantec 2014). ASE reviewed a groundwater investigation report from the Former Penske Truck Leasing Facility located at 725 Julie Ann Way in Oakland (RO0354) which is approximately 750 feet southeast of the subject site. The depth to water in the groundwater monitoring wells at the PENSKE site ranged from approximately 4 to 6 feet bgs (approximately 4.31 to 6.84 feet MSL). Further evidence of a west-northwest flow direction at the subject site is the fact that soil boring HP-2 is northwest of the former UST at the Site and it contained the highest concentrations of hydrocarbons in groundwater.		
Surface Water Bodies		The closest surface water body is the Oakland Inner Harbor, which is approximately 0.6 miles west of the site.		
Nearby Wells		Based on information within the (PENSKE Stantec 2014) request for closure report in January 2014 for a neighboring site (RO0354), a well survey of the area identified no wells within 1 mile of their site. ASE believes that this information is valid for the subject site, and thus there are no nearby wells that could be impacted by any of the previously identified pollution in the groundwater on-site.		
Release Source and Volume		A 1,000 gallon gasoline underground storage tank (UST) was removed from the subject site in 1991. A report of the UST removal was not prepared. There is no soil or groundwater sample data from the time of the UST removal. A dispenser and a short run of steel piping were located on top of the UST location (per Mr. Elliott). Based on soil and groundwater samples detailed in the AEI 2014 report, a release of hydrocarbons appears evident from the UST or	2	See data gaps table. Additional assessment activities will be conducted in the source areas. An excavation, soil

		the dispenser and piping which was located on top of the UST. There is no data that can be recovered regarding the integrity of the UST, the dispenser or piping at the time of the UST removal. The AEI 2014 boring log of soil boring SB-1 noted an oil/sheen on the core. The former gasoline UST and dispenser are considered the main source of the release of fuel hydrocarbons that have been detected in soil and groundwater beneath the Site (AEI 2014). The release from the UST at the Site was discovered on November 10, 2014 during Phase II site assessment activities (AEI 2014). The volume of the release is not known. The area immediately around the former UST is considered a potential source area.		borings and/or monitoring wells may be installed.
LNAPL		There are currently no groundwater monitoring wells located at the Site. Although light non-aqueous phase liquids (LNAPL) were not observed during grab groundwater sampling activities by AEI in 2014, a notation on their boring log suggested an oil/sheen on the core of soil boring SB-1. This oil/sheen may indicate the potential for the LNAPL to be present.	3. Need to investigate for LNAPL.	Perform an excavation within the former UST pit; allow groundwater to infiltrate pit; visually check for LNAPL on a scheduled basis.
Source Removal Activities		A 1,000 gallon gasoline UST was removed from the subject site in 1991. A report of the UST removal was not prepared. ASE is unable to identify any further data from the site owner or from records regarding source removal at the time of the UST removal.	4. Remove source as necessary.	If LNAPL is identified in UST pit, removal of LNAPL and adjacent soil should be performed.
Contaminants of Concern		Based on the AEI 2014 investigation conducted at the Site, TPH-G and BTEX are present in groundwater. The TPH-G, benzene and toluene concentrations in 3 of the 4 soil borings are above their respective ESLs. These COCs are present above the screening levels primarily in the former UST pit and just northwest of the pit. The ACEH has also directed any future assessment activities to include TPH-D as well. Napthalene will also be added.		
Petroleum Hydrocarbons in Soil		During the AEI 2014 site assessment, no soil samples were collected for analysis due to the very shallow depth of groundwater.	5. Additional soil sampling is required to better define the vertical extent of	Additional soil borings to be advanced, as described in the

			contamination	data gaps table.
Petroleum Hydrocarbons in Groundwater		Based on the AEI 2014 investigation conducted at the Site, TPH-G and BTEX are present in groundwater. The highest concentrations were identified in a soil boring drilled just northwest of the former UST. The grab groundwater sample from this location contained 6,200 parts per billion (ppb) TPH-G, 73 ppb benzene, 12 ppb toluene and 13 ppb xylenes.	6. Define the horizontal extent of hydrocarbons in groundwater.	Additional assessment activities will need to be conducted in and west-northwest of the source area. An excavation, soil borings and/or monitoring wells may be installed
Risk Evaluation		The Site is a former roofing contractor yard. It is currently being used as a yard for a hazardous waste contractor and hauler. The Site has two buildings on it used for office space and warehouse space. An open air building exists along the western property line that is used for a shop area and for storage. The remainder of the yard is open air, for the storage of heavy equipment, trucks, bins, and various construction materials. The Site is zoned for commercial/industrial usage, and there are no plans to re-develop the site. The SCM identifies the primary source; impacted media; release mechanism(s); secondary source(s); exposure route; potential receptors (commercial/industrial worker, and construction worker), and an assessment of whether the exposure route/pathway is potentially complete, incomplete, or insignificant. Potential exposure routes that have been evaluated include incidental ingestion, dermal contact, dust inhalation, and vapor inhalation. For direct contact with contaminated soil, the exposure route for incidental ingestion, dermal contact, and dust inhalation for a commercial/industrial worker are considered incomplete since the on-site asphalt and concrete surfaces eliminate the exposure route. These exposure routes for the construction worker are considered a potentially complete pathway, depending on the nature of the work. For volatilization from soil to outdoor air, vapor inhalation is the potential exposure pathway. Given dilution effects that take place outdoors, this exposure pathway is considered incomplete. For indoor air, this exposure pathway is considered potentially	7. Further assessment of soil vapor and groundwater is needed	Additional assessment activities will need to be conducted in and west-northwest of the source area. An excavation, soil borings, soil vapor borings and/or monitoring wells may be installed

Risk Evaluation		The Site is a former roofing contractor yard. It is currently being used as a yard for a hazardous waste contractor and hauler. The Site has two buildings on it used for office space and warehouse space. An open air building exists along the western property line that is used for a shop area and for storage. The remainder of the yard is open air, for the storage of heavy equipment, trucks, bins, and various construction materials. The Site is zoned for commercial/industrial usage, and there are no plans to re-develop the site. The SCM identifies the primary source; impacted media; release mechanism(s); secondary source(s); exposure route; potential receptors (commercial/industrial worker, and construction worker), and an assessment of whether the exposure route/pathway is	7. Further assessment of soil vapor and groundwater is needed	Additional assessment activities will need to be conducted in and west-northwest of the source area. An excavation, soil borings, soil vapor borings and/or monitoring wells may be installed

Table 2
Data Gaps Summary and Proposed Investigation

Item	Data Gap Item #	Proposed Investigation	Rationale	Analyses
1	Lack of on-site Geologic Conditions.	Future assessment activities will be required at the site for hydrocarbon plume definition in soil and groundwater. Any drilling activities will be directed and logged by an ASE professional geologist, and boring logs will be completed.	Future assessment activities that provide actual on-site soil data will be beneficial in determining if subsurface conditions exist that may impact the movement of pollutants.	

Table 2
Data Gaps Summary and Proposed Investigation (Continued)

Item	Data Gap Item #	Proposed Investigation	Rationale	Analyses
2	Release source and volume	ASE proposes an excavation within the former UST pit to evaluate petroleum hydrocarbon concentrations in soil and groundwater, and to investigate for the presence of suspected LNAPL.	Creating an excavation within the former UST pit will allow for source removal, visual inspection of the groundwater surface for LNAPL, and will allow for soil samples to be collected within the source area.	All soil and groundwater samples will be subject to analysis for TPH-G, BTEX, 5 Oxys and napthalene by EPA Method 8260, and TPH-D by EPA Method 8015
3	LNAPL	ASE proposes an excavation within the former UST pit to investigate for the presence of suspected LNAPL.	An 8-foot square by 10-foot deep excavation will allow for contaminated soil and groundwater removal, and allow for visual inspection of the groundwater surface for LNAPL. If LNAPL exists, it will be noted, its thickness will be measured, and then the LNAPL will be removed using a vacuum truck. All of these activities can be performed at a low-cost by the on-site tenant (hazardous waste contractor) using on-site equipment. The waste generated can be appropriately disposed of by the tenant as well. Visual inspection and removal of LNAPL will continue until LNAPL is no longer present.	All removed soil and groundwater will be sampled and analyzed prior to off-site disposal. Samples will be subject to analysis for TPH-G, BTEX, 5 Oxys and napthalene by EPA Method 8260, and TPH-D by EPA Method 8015

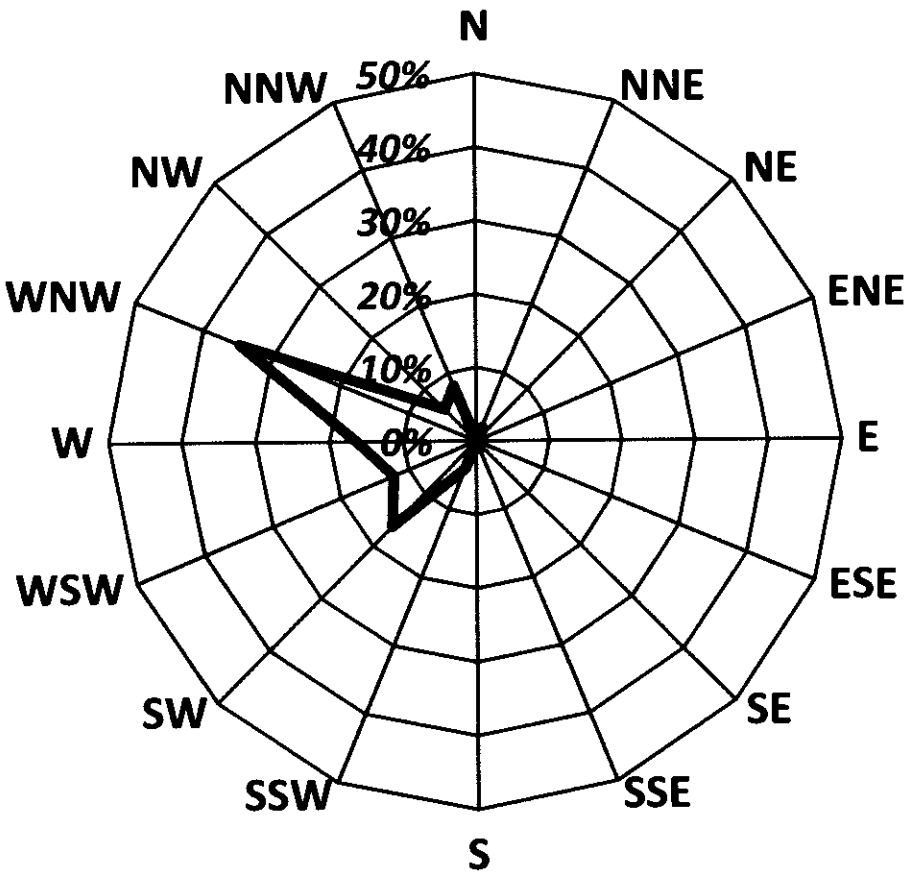
Table 2
Data Gaps Summary and Proposed Investigation (Continued)

Item	Data Gap Item #	Proposed Investigation	Rationale	Analyses
4	Source removal activities	ASE proposes an excavation within the former UST pit to evaluate petroleum hydrocarbon concentrations in soil and groundwater, and to investigate for the presence of suspected LNAPL.	Should the excavation within the former UST pit identify elevated concentrations of petroleum hydrocarbons in the soil, the contaminated soil can be removed from the excavation, where feasible, and disposed of off-site. Equally, if a visual inspection of the groundwater surface shows LNAPL, the LNAPL can be removed and disposed of off-site.	All removed soil and groundwater will be sampled and analyzed prior to off-site disposal. Samples will be subject to analysis for TPH-G, BTEX, 5 Oxys and napthalene by EPA Method 8260, and TPH-D by EPA Method 8015
5	Petroleum hydrocarbons in soil	During the AEI 2014 site assessment, no soil samples were collected for analysis due to the very shallow depth of groundwater. ASE proposes that additional soil borings be drilled in the presumed downgradient direction (west, northwest (PENSKE Stantec 2014), to define the lateral extent of hydrocarbons in soil. ASE estimates the need for 2 to 3 additional soil borings.	Hydrocarbon pollution in groundwater south and east of the former UST appears to have been defined to acceptable levels based on the AEI 2014 Phase II assessment. Further assessment of hydrocarbons in soil is necessary to define the pollution north and west of the former UST and AEI soil boring HP-2.	All samples will be subject to analysis for TPH-G, BTEX, 5 Oxys and napthalene by EPA Method 8260, and TPH-D by EPA Method 8015
6	Petroleum hydrocarbons in groundwater	Based on the AEI 2014 investigation conducted at the Site, TPH-G and BTEX are present in groundwater. The highest concentrations were identified in a soil boring drilled just northwest of the former UST. The grab groundwater sample from this location contained 6,200 parts per billion (ppb) TPH-G, 73 ppb benzene, 12 ppb toluene and 13 ppb xylenes. Additional soil borings will be drilled in	Hydrocarbon pollution in groundwater south and east of the former UST appears to have been defined to acceptable levels based on the AEI 2014 Phase II assessment. Further assessment of hydrocarbons in groundwater is necessary to define the pollution north and west of the former UST and AEI soil boring HP-2.	All samples will be subject to analysis for TPH-G, BTEX, 5 Oxys and napthalene by EPA Method 8260, and TPH-D by EPA Method 8015

Table 2
Data Gaps Summary and Proposed Investigation (Continued)

Item	Data Gap Item #	Proposed Investigation	Rationale	Analyses
		the presumed downgradient direction (west, northwest (PENSKE Stantec 2014), to define the lateral extent of hydrocarbons in groundwater. ASE estimates the need for 2 to 3 additional soil borings.		
7	Risk evaluation	Due to the unknown lateral extent of hydrocarbons in soil, groundwater and soil vapor, a potential health risk exists at the site for the tenant's workers. ASE proposes additional soil and groundwater assessment as detailed in numbers 5 & 6 above, as well as performance of a sub-slab vapor survey inside the building adjacent to the former UST which is used for office space. ASE estimates the need for 2 soil-vapor borings.	The additional soil, groundwater and soil-vapor sample analyses will be beneficial in determining if remedial activities are necessary to remove a possible health risk to on-site workers. The data will be compared to CHSSL's to determine if a health risk exists or not at the Site.	All samples will be subject to analysis for TPH-G, BTEX, 5 Oxys and napthalene by EPA Method 8260, and TPH-D by EPA Method 8015. Vapor samples will be subject to analysis of volatile organics by TO-15.

Figure 5
Groundwater Flow Directon Rose Diagram
725 Julie Ann Way, Oakland California
1991 to 2014



Stantec