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By Alameda County Environmental Health 3:41 pm, Aug 23, 2017

August 18, 2017

Mr. Robert Schultz  
Alameda County Environmental Health  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502

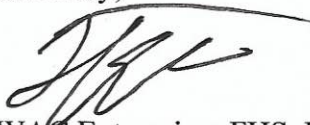
**Subject: Submittal Acknowledgement Statement  
Work Plan, Data Gap Investigation**  
Former Young's Cleaners  
10700 MacArthur Boulevard  
Oakland, California 94605  
AEI Project No. 365948  
Toxics Case No. RO0002580

Dear Mr. Schultz:

I have read and acknowledge the content, recommendations and/or conclusions contained in the attached document or report submitted on my behalf to ACDEH's FTP server and the State Water Resources Control Board's Geotracker website.

If you have any questions or need additional information, please do not hesitate to call the undersigned at (310) 270-8339, or Mr. Peter McIntyre at AEI Consultants, (925) 746-6004.

Sincerely,



WAC Enterprises FHS, LLC  
8245 W. 4<sup>th</sup> Street,  
Los Angeles, CA 90048

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



# AEI Consultants

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August 18, 2017

Mr. Robert Schultz  
Alameda County Department of Environmental Health  
1131 Harbor Parkway  
Alameda, California 94502

**Re: Work Plan, Data Gap Investigation**

Former Young's Cleaners  
10700 MacArthur Boulevard, Oakland, California  
Toxics Case No. RO0002580  
AEI Project No. 365948

Dear Mr. Schultz:

On behalf of WAC Enterprises FHS, LLC (WAC), AEI Consultants (AEI) has prepared this work plan to perform additional characterization activities to address identified data gaps in groundwater at the former Young's Cleaners at 10700 MacArthur Boulevard in Oakland, California ("the Site"). These data gaps were originally outlined in AEI's draft *Remedial Action Plan (RAP)*, as discussed during the meeting with the Alameda County Department of Environmental Health (DEH) on July 18, 2017. This work plan is being submitted as requested in the July 25, 2017 letter from the DEH.

The objective of the proposed investigation is to:

- Further characterize the vertical and lateral extent of volatile organic compounds (VOCs), specifically tetrachloroethene (PCE) and trichloroethene (TCE) in soil and groundwater beneath the Site.
- Provide additional data to inform the design of a remedial program to address residual VOCs in groundwater as warranted by the data.

## **SITE SETTING**

The Site is approximately 13.5 acres in size and is currently developed with the Foothill Square Shopping Center. The property is situated in an urban mixed commercial and residential area of Oakland, California and is bound by MacArthur Boulevard to the west, Foothill Boulevard to the east, and 108<sup>th</sup> Avenue to the south. An ARCO-branded gasoline service station is located adjacent to the northwest corner of the property (ARCO 0276). Residential properties are present adjacent to the Site to the north and immediately beyond 108<sup>th</sup> Avenue to the south. Commercial properties are located immediately west

of MacArthur Boulevard with residential properties further to the west. The Interstate 580 is located across Foothill Boulevard to the east. The Location of the Site is shown on Figure 1. Figure 2 presents the Site plan.

The Site is located on a broad, gently westward sloping area produced by coalescing alluvial fans and bay margin plains along the eastern shore of San Francisco Bay. In the vicinity of the Site the native sediments underlying the surface are mapped as Holocene aged alluvium, consisting of weakly consolidated, slightly weathered poorly sorted, irregularly bedded clay, silt, sand and gravel, interpreted to be primarily alluvial fan and fluvial deposits. These alluvial fan deposits extend westward over the Late Pleistocene Alameda formation, the major basin-filling unit in the area.

Based on the available soil logs, the geological observations reported in AEI's *Soil Remedial Investigation and Excavation Project Summary* dated February 7, 1996, and known Site history, surface soils at the Site consist of native and non-native fill materials from previous development and grading of the Site. These fill materials are present to a depth of up to four-feet below ground surface (bgs).

The underlying soils are predominantly comprised of low permeability, fine grained silts and clays with intermittent lenses of sands of higher permeability sand and silt units. As depicted on the geologic cross-sections provided in Figures 3 and 4, a significant sand unit was identified between 30 and 50 feet bgs in wells and borings completed along the western portion of the property. Available lithological data in the central and eastern portions of the Site do not extend to a sufficient depth to determine if this sand unit is present in these areas.

Previous environmental consultants have been subdivided groundwater into two distinct water-bearing zones: the "Shallow" and "Deep" zones, with the Shallow Zone occurring between 0 and 37 feet bgs and the deep zone occurring from approximately 40 to 65 feet bgs (the maximum depth explored). Rather than changes in lithology, this distinction appears to have been based on differences in potentiometric head and contaminant concentration in groundwater observed in wells completed in the two zones. No known communication tests have been conducted at the Site to determine the degree of hydraulic communication between the identified two zones or between wells within the same zone. Historically, groundwater has flowed to the west-northwest in the shallow zone wells and to the west-southwest for the deep wells.

PCE and its degradation products have historically been detected in groundwater at the Site at concentrations that generally decrease with distance from the soil source area. Isoconcentration contours of PCE in groundwater for the shallow and deep zones are depicted in Figures 5 and 6, respectively. These isoconcentration contours were derived based on the available historical groundwater analytical data. Other degradation products have historically been reported, but are not present at sufficient quantities relative to PCE and TCE to warrant further discussion. The concentrations of PCE in groundwater have

historically been greatest in the vicinity of groundwater monitoring well AMW-6R and its predecessor AMW-6 with a maximum reported concentration of 4,600 micrograms per liter ( $\mu\text{g/L}$ ) for PCE and 580  $\mu\text{g/L}$  for TCE (September of 1997). The presence of dense non-aqueous phase liquid (DNAPL), such as PCE, has not been reported and is not likely present based on PCE concentrations observed in groundwater.

The groundwater monitoring well network that has historically been used to monitor groundwater at the Site has been significantly reduced by the destruction of wells associated with the adjacent ARCO 0276 and the destruction of on-site monitoring wells which were located within the remedial excavation area and the 2012 grading and excavation areas for the utility improvements. The remaining monitoring well network consists of four on-site monitoring wells (AMW-1, AMW-6R, AMW-8, and AMW-9) and two off-site monitoring wells (FHS MW-10, and FHS MW-11). Of these monitoring wells, two are located within the shallow zone (AMW-1 and AMW-6) and the remaining four are located in the deep zone. Stratigraphic data and well installation reports for AMW-8, AMW-9, and the two off-site monitoring wells were not able to be located. The available historical groundwater data is sufficient to delineate the lateral extents of PCE in groundwater that exceeds the ESL for vapor intrusion (880  $\mu\text{g/L}$ ) for the shallow zone, but are insufficient to define the extents of PCE in groundwater that exceed the USEPA Maximum Concentration Limit (MCL) in both the deep and shallow zones.

Based on the available groundwater analytical data, the extents of the PCE plume in groundwater that exceeds the MCL is laterally un-defined in both the shallow and deep zones. Furthermore, the transport of PCE and TCE vertically between the shallow and deep wells is undefined.

## PROPOSED INVESTIGATION

AEI proposes the following investigation to further characterize the lateral and vertical extent of VOCs, primarily PCE, in groundwater at the Site. We propose to advance a total of four soil borings at the Site to a total depth of approximately 50-feet bgs at the locations shown on Figure 7 to provide additional lithologic data and to choose screen intervals for four new wells. The location and purpose of the proposed wells is as follows:

Well ID	Well Location and Purpose
MW-12	Proposed shallow well to the east of the Site in the upgradient direction of the estimated PCE plume beyond historical well AMW-3. Shallow well to be used as a replacement for historical well AMW-3 in an effort to further define PCE in the upgradient direction of the source area.
MW-13	Proposed shallow well to the south of the site near former wells AMW-4 and AMW-5 to be used as a replacement for these wells and further define PCE in the cross gradient direction from the Site.

MW-14	Proposed shallow well southwest of the building extent to further delineate the shallow PCE plume in the cross gradient flow direction towards the furthest extent of the PCE plume in this direction.
MW-15	Proposed deep well to the west of the building near former well MW-6, to be used as a replacement well for MW-6 and define PCE concentrations within the deep water-yielding horizon between the source area and offsite wells FHS MW-10 and FHS MW-11.

Upon completion of the borings, each borehole will be completed as a groundwater monitoring well, either within the identified shallow zone (MW-12, MW-13, and MW-14) or deep zone (MW-15). The data collected from these wells will be used to update the conceptual site model for the Site. The investigation will generally be performed as follows; however, specific details, such as screen depth and interval, will be determined based on field observations.

### **Pre-Field Activities**

A Site-specific health and safety plan will be prepared, reviewed by on-site personnel, and kept on-site for the duration of the fieldwork. Drilling permits will be obtained from Alameda County Public Works Agency (ACPWA) for this investigation. The public underground utility locating service Underground Service Alert (USA) will be notified to identify public utilities in the work area at least 48 hours prior to drilling activities. In addition, a private utility locating company will be used to clear each of the proposed drilling locations for utilities.

### **Soil Boring Advancement and Sampling**

AEI will contract a licensed drilling company to advance each of the four soil boring, MW-12 through MW-15, at the locations shown on Figure 7. Each soil boring will be advanced using a truck mounted direct-push drill rig using dual walled tooling, to minimize the potential for cross contamination between water-yielding horizons, to a total depth of 45-feet bgs. During soil boring advancement a soil core will be collected continuously for lithologic logging and sampling. The collected core will be described using the Unified Soil Classification System (USCS) and Munsell Soil Color Chart. At select locations the soil will be screened for the presence of VOCs using a photoionization detector (PID). The USCS description, PID measurement, and other notable features will be recorded on field boring logs.

At select locations, and where elevated PID readings are observed, soil samples will be collected for potential analysis. Soil samples will be collected using En Core<sup>®</sup>, or equivalent, type samplers. Each sample will be labeled with a unique identifier and placed in an ice-chilled cooler for transport to the laboratory. A selection of the collected soil samples will be analyzed for VOCs using US EPA Testing Method 8260B.

Upon reaching the boring terminus, a deep groundwater sample will be collected. The groundwater sample will be collected by placing new, disposable temporary well casing with a five-foot screened section inside the outer drill casing and retracting the outer drill casing one to two-feet to allow water to collect in the borehole. Groundwater samples will be collected after initially purging the borehole at a rate to limit turbidity using either a peristaltic pump or new disposable bailer, as appropriate based on depth. During purging, if slow recharge is observed, a grab groundwater sample will immediately be collected. The sample will be decanted into laboratory-supplied, appropriately-preserved, bottles. Collected groundwater samples will be sealed, labeled, and placed in an ice-chilled cooler for transport to the laboratory. Each groundwater sample collected will be analyzed for VOCs using US EPA Testing Method 8260B.

### **Soil Boring Destruction**

Following sample collection and removal of drill tooling, each soil borings will be destroyed by filling the soil boring with neat cement grout in accordance with the requirements of the permit with the ACPWA.

### **Groundwater Monitoring Well Construction**

Following the soil boring advancement and sampling activities, shallow groundwater monitoring wells will be installed immediately adjacent to each boring, MW-12, MW-13, and MW-14. Wellbores for the monitoring wells will be advanced using a drilling rig capable of spinning 8¼-inch diameter hollow-stem augers. The wells will be constructed with two-inch diameter well casing, with approximately 10 feet of factory slotted 0.020-inch well screen. The screened interval is anticipated to be between 15-25 feet bgs; however, depths and well screen lengths may be adjusted based on field conditions such that the well is installed with the screen across the saturated sediments. The well casings will be installed through the augers. The casing will be flush threaded PVC fitted with a threaded bottom cap. An annular sand pack (consisting of clean #3 Monterey Sand) will be installed through the augers to approximately 2 feet above the screened interval. During placement of the sand pack, the augers will be lifted from the borehole in 1-foot lifts. A minimum bentonite seal of 2 feet will be placed above the sand and hydrated. The remainder of the well will be sealed with cement grout annular seal. Each will be equipped with a locking, expandable inner cap and finished with a flush mount traffic rated well box.

Well MW-15 is proposed to be installed as a deep groundwater monitoring well. In an effort to seal off the shallow groundwater zone during installation, the upper 30 feet will be over-drilled with 12¼-inch diameter hollow stem augers. Upon reaching the desired depth of 30 feet bgs, which may be altered based on observed soil lithology, a 10-inch diameter conductor casing will be installed and sealed with neat cement grout. Drilling will then resume using 8¼-inch diameter hollow stem augers through the conductor casing to an approximate depth of 45 feet bgs. A deep well will then be constructed with two-inch diameter well casing, with approximately 10 feet of factory slotted 0.020-inch

well screen. The screened interval is anticipated to be between 35-45 feet bgs; however, depths and well screen lengths may be adjusted based on field conditions.

The well casing will be installed through the augers. The casing will be flush threaded PVC fitted with a threaded bottom cap. An annular sand pack (consisting of clean #3 Monterey Sand) will be installed through the augers to approximately 2 feet above the screened interval. During placement of the sand pack, the augers will be lifted from the borehole in 1-foot lifts. A minimum bentonite seal of 2 feet will be placed above the sand and hydrated. The remainder of the well will be sealed with cement grout annular seal. Each will be equipped with a locking, expandable inner cap and finished with a flush mount traffic rated well box.

Each of the newly constructed monitoring wells will be developed after allowing a minimum of 72-hours to allow the grout to cure. Well development will be performed by surging, bailing, and purging to remove accumulated fines from the casing and sand pack, and increase communication with the formation.

Each newly installed well will be surveyed relative by a California licensed land surveyor, and the data will be uploaded to the state Geotracker database as required. DWR well registration forms (DWR Form 188) will be completed for each of the wells upon installation.

The newly installed groundwater monitoring wells will be added to the existing monitoring programs and sampled and analyzed in accordance with current sampling techniques.

### **Equipment Decontamination**

Sampling equipment, including sampling barrels, augers, and other equipment used to sample during the well installation and sampling activities will be decontaminated between samples using a triple rinse system containing Alconox™ or similar detergent.

### **Waste Storage**

Drill cuttings, other investigation-derived waste (IDW), purged groundwater, and equipment rinse water will be stored in sealed and labeled 55-gallon drums. Solids and liquids will be stored in separate drums. All drums will be located on-site in a secure location, pending the results of sample analyses. Upon receipt of results, the waste will be profiled and disposal arranged to a proper facility; disposal documentation will be provided.

### **Reporting**

AEI will prepare a report following the receipt of analytical data. The report will detail the investigation methods along with the analytical results and will be used to update the



conceptual site model. The report will include soil boring logs, tables summarizing the analytical results, figures presenting the data, and copies of laboratory analytical reports.

## **SCHEDULE**

Monitoring well installation activities are anticipated to commence within one month of receiving approval from the DEH. A report of the well installation activities and initial sampling event will be provided within 60-days following receipt of all analytical data.


## **CLOSING**

AEI appreciates working with the DEH to complete the characterization and move this Site actively towards closure and trust that this work plan meets with your approval. Please contact the undersigned at (925) 746-6000 if you have any questions or comments.

Sincerely,  
**AEI Consultants**



Jeremy Smith  
Senior Project Manager



Trent A. Weise, P.E.  
Vice President

Enclosures:

Figure 1 – Site Location

Figure 2 – Site Plan

Figure 3 – Geologic Cross Section A-A'

Figure 4 – Geologic Cross Section B-B'

Figure 5 – PCE Isoconcentration Contours – Shallow Zone

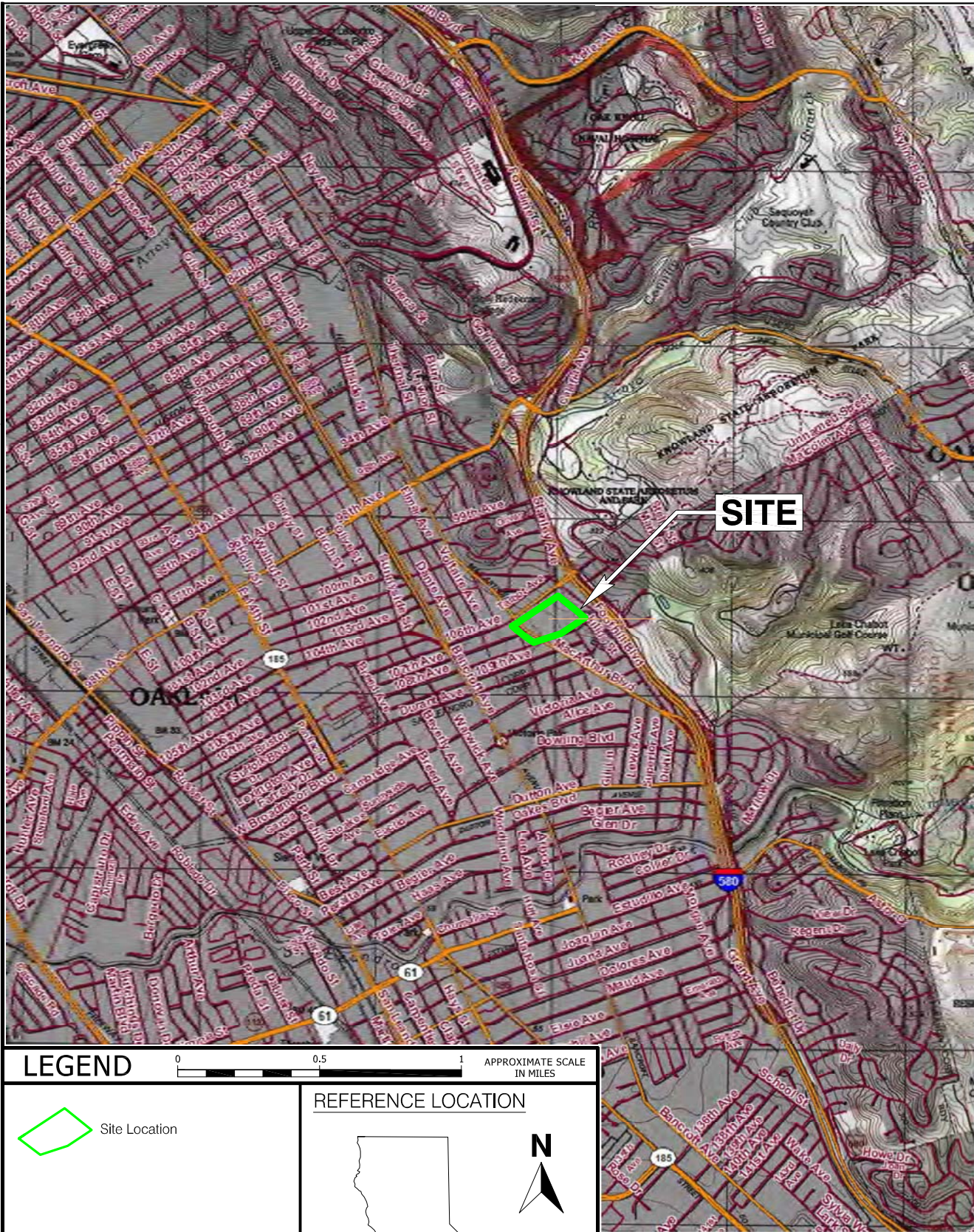
Figure 6 – PCE Isoconcentration Contours – Deep Zone

Figure 7 – Proposed Monitoring Well Locations





## Figures



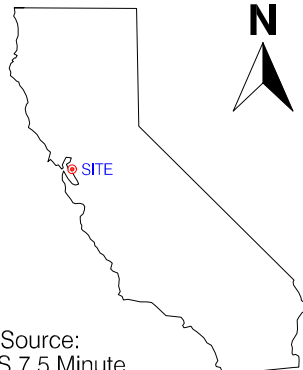
**SITE**

**LEGEND**



 Site Location

**REFERENCE LOCATION**



Map Source:  
USGS 7.5 Minute  
Topographic Quadrangle Map,  
San Leandro, CA - 1993

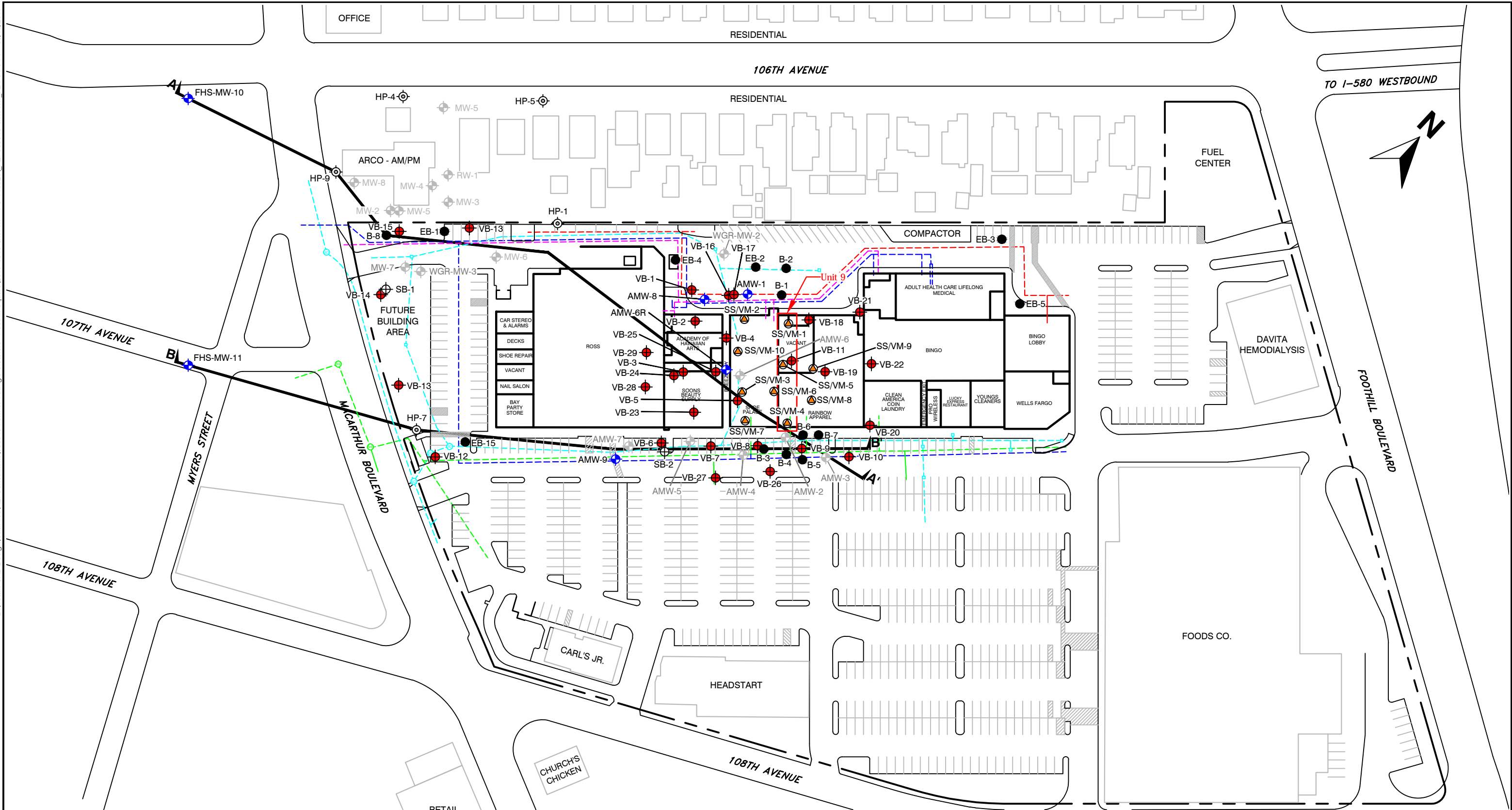
**AEI Consultants**  
2500 Camino Diablo, Walnut Creek, California

**SITE LOCATION MAP**

Foothill Square  
10700 MacArthur Boulevard  
Oakland, California

**FIGURE 1**  
Project No. 965948

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**LEGEND**

- |  |   |                                     |                             |
|--|---|-------------------------------------|-----------------------------|
| AMW-1  Groundwater Monitoring Well                         | HP-1  Soil Boring (Kaldveer, 1988)            | Approximate Property Boundary       | Storm Drain Line            |
| MW-5  Abandoned Groundwater Monitoring Well                | EB-1  Soil Boring (Augeas, 1994)              | Location of Geologic Cross-Sections | Sanitary Sewer Line         |
| SS/VM-1  Twinned Permanent Soil Vapor/Sub-Slab Vapor Probe | B-1  CPT Boring/Hydropunch Sample (PES, 1997) | Former Dry Cleaner Location         | Underground Electrical Line |
| VB-1  Temporary Soil Vapor Probes (AEI, 2006-2008)         |   |                                     | Natural Gas Line            |
| SB-1  Soil Boring (AEI, 2006)                              |   |                                     | Water Line                  |



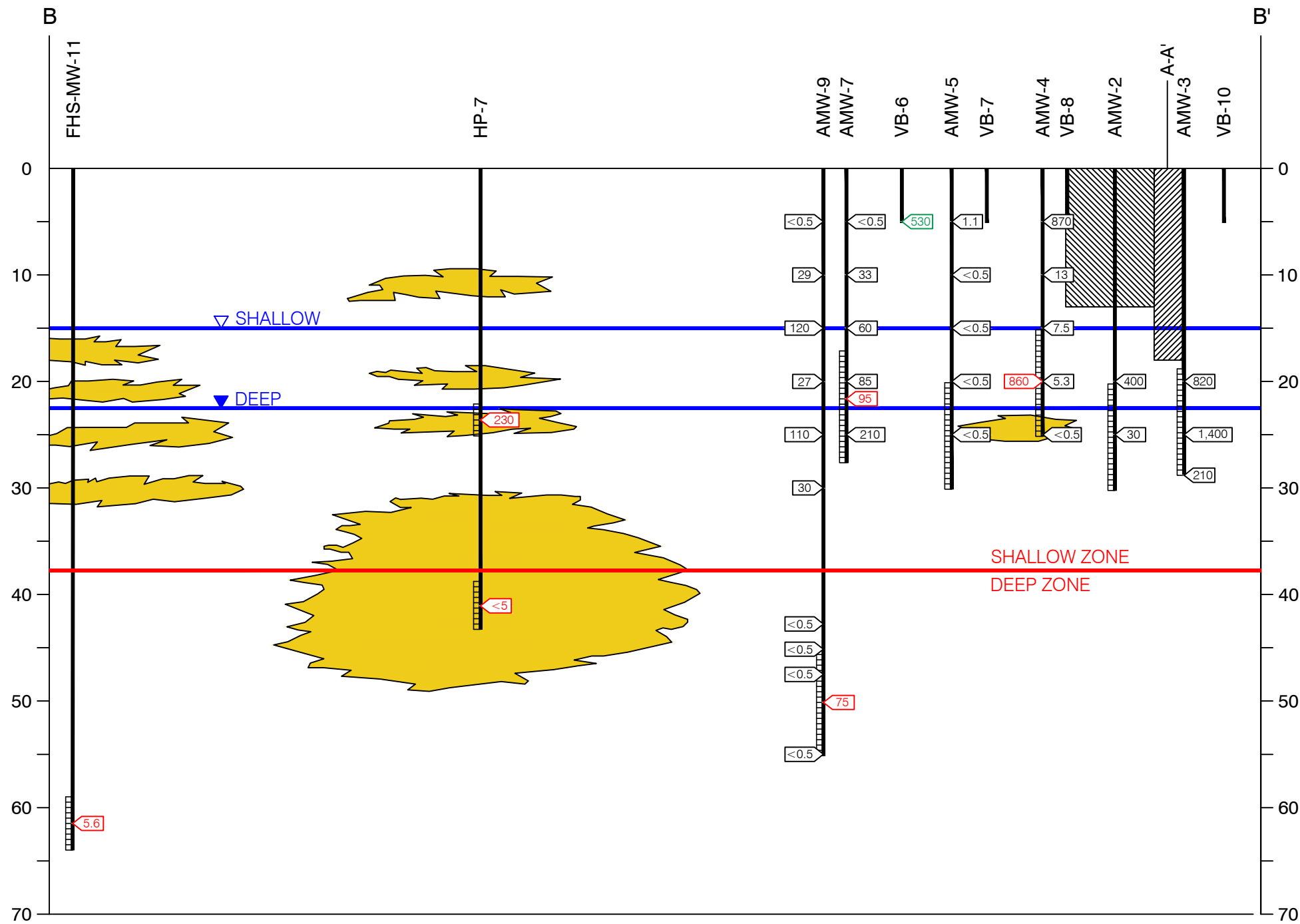
**AEI Consultants**  
2500 Camino Diablo, Walnut Creek, California

**SITE PLAN**

Foothill Square  
10700 MacArthur Boulevard  
Oakland, California

**FIGURE 2**  
Project No. 365948





**LEGEND**

- Sand (SP)
- PCE Concentration in Groundwater (µg/L)
- PCE Concentration in Soil (µg/kg)
- PCE Concentration in Soil Vapor (µg/L)
- Approximated Depth of Shallow Zone Potentiometric Surface
- Approximated Depth of Deep Zone Potentiometric Surface



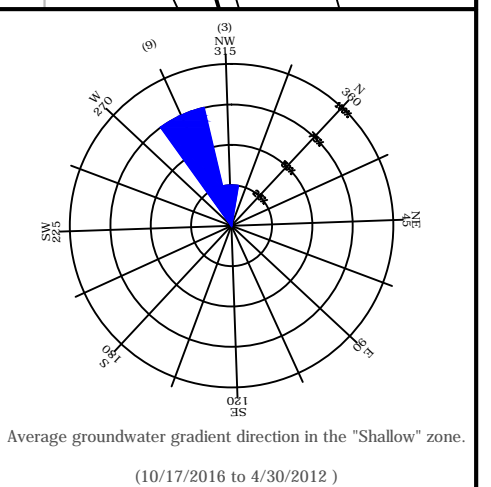
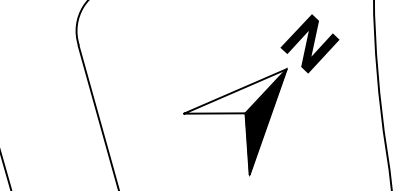
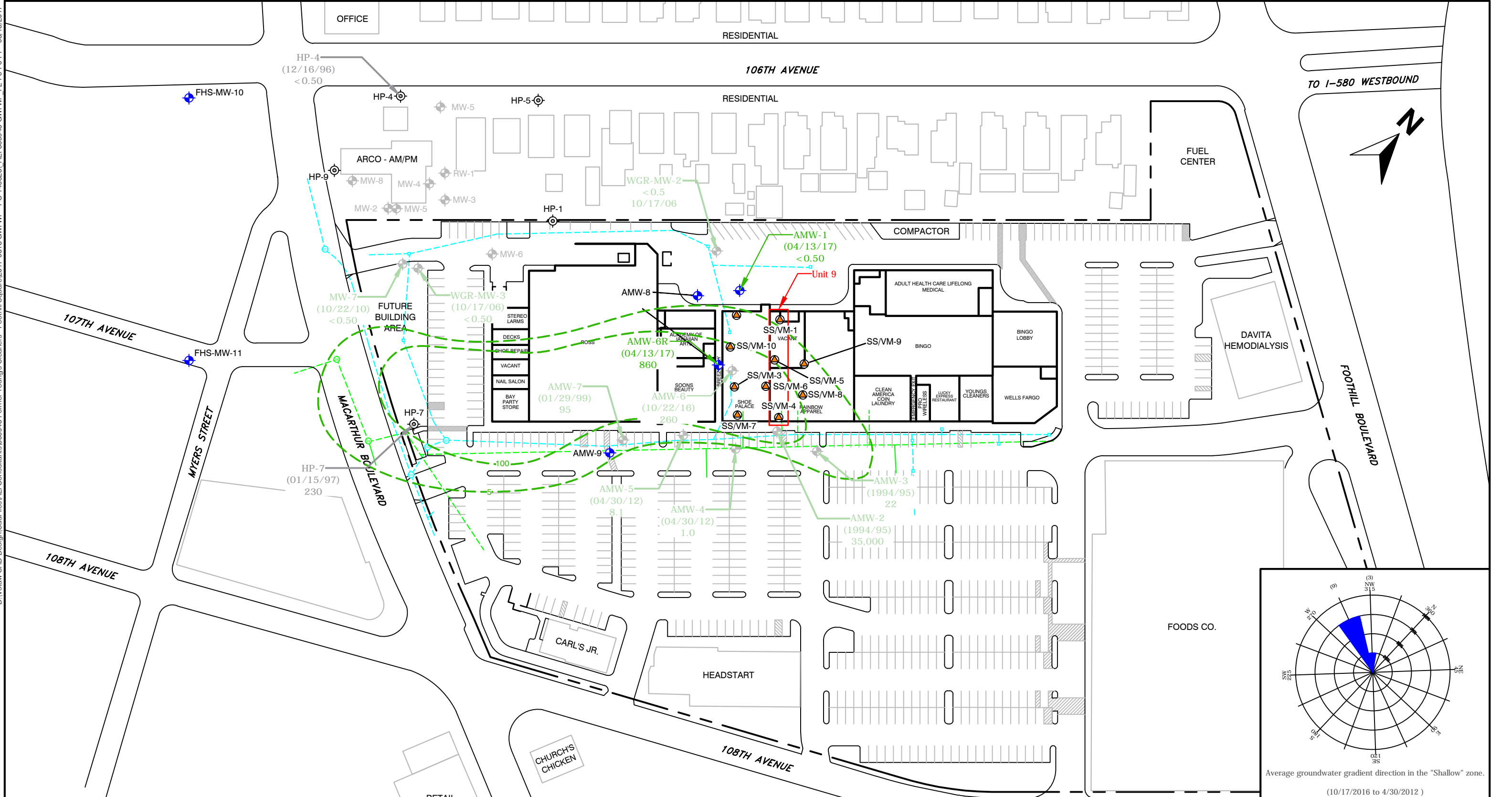
**AEI Consultants**  
2500 Camino Diablo, Walnut Creek, California

**GEOLOGIC CROSS-SECTION  
B-B'**

Foothill Square  
10700 MacArthur Boulevard  
Oakland, California

**FIGURE 4**  
Project No. 365948

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LEGEND	
AMW-1	Groundwater Monitoring Well
MW-5	Abandoned Groundwater Monitoring Well
SS/VM-1	Twinned Permanent Soil Vapor/Sub-Slab Vapor Probe
HP-1	CPT Boring/Hydropunch Sample (PES, 1997)
[Red Box]	Former Dry Cleaner Location
[Dashed Line]	Approximate Property Boundary
[Green Dashed Line]	PCE Isoconcentration Contour Line for Shallow Zone ( $\mu\text{g/L}$ )
[Blue Dashed Line]	Storm Drain Line
[Green Dashed Line]	Sanitary Sewer Line
[Sample Location]	Existing Monitoring Point
[Sample Collection Date]	Sample Collection Date
[PCE Groundwater Concentration]	PCE Groundwater Concentration ( $\mu\text{g/L}$ )
[Sample Location]	Destroyed Monitoring Point
[Sample Collection Date]	Sample Collection Date
[PCE Groundwater Concentration]	PCE Groundwater Concentration ( $\mu\text{g/L}$ )
[Sample Location]	Grab Groundwater Sample
[Sample Collection Date]	Sample Collection Date
[PCE Groundwater Concentration]	PCE Groundwater Concentration ( $\mu\text{g/L}$ )

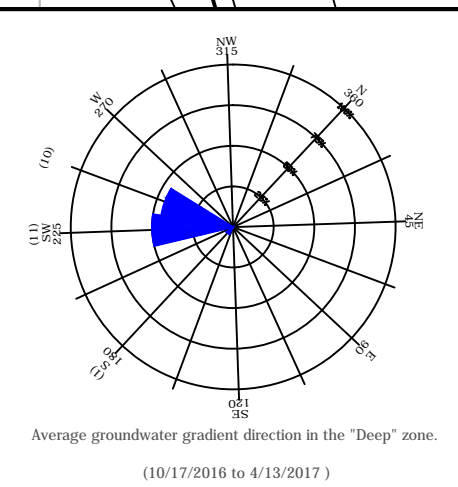
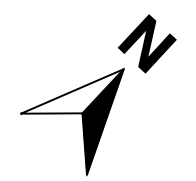
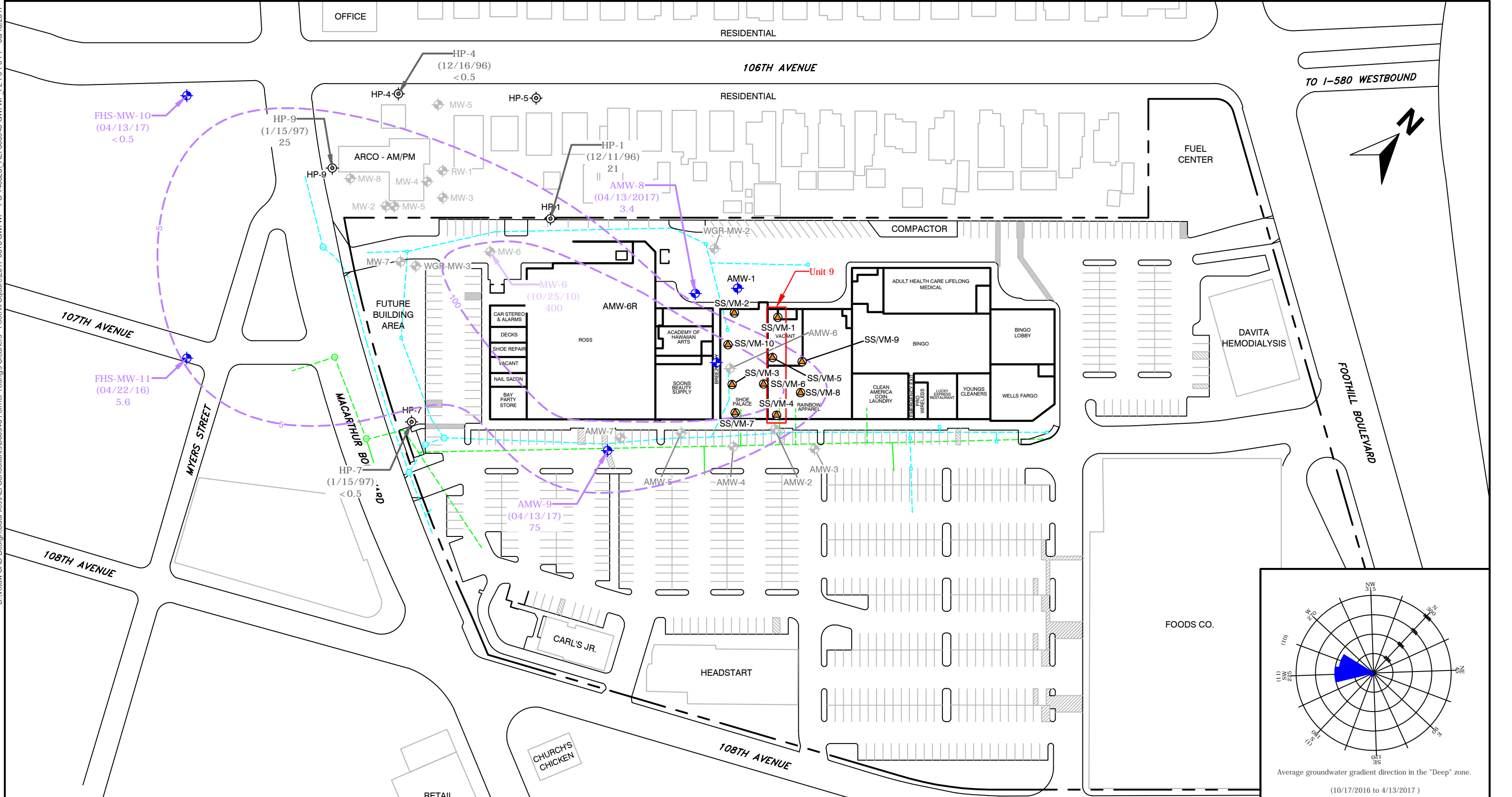


**AEI Consultants**  
2500 Camino Diablo, Walnut Creek, California

**PCE ISOCONCENTRATION SHALLOW ZONE**

Foothill Square 10700 MacArthur Boulevard Oakland, California	<b>FIGURE 5</b> Project No. 365948
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<b>LEGEND</b>			
AMW-1  Groundwater Monitoring Well	Former Dry Cleaner Location	Approximate Property Boundary	Storm Drain Line
MW-5  Abandoned Groundwater Monitoring Well		PCE Isoconcentration Contour Line for Deep Zone ( $\mu\text{g/L}$ )	Sanitary Sewer Line
SS/VM-1  Twinned Permanent Soil Vapor/Sub-Slab Vapor Probe			
HP-1  CPT Boring/Hydropunch Sample (PES, 1997)			

APPROXIMATE SCALE IN FEET

Sample Location	Existing Monitoring Point	Destroyed Monitoring Point	Grab Groundwater Sample
Sample Collection Date	AMW-9 (04/13/2017)	AMW-6 (10/25/10)	HP-7 (1997)
PCE Groundwater Concentration ( $\mu\text{g/L}$ )	75	400	<math>< 5.0</math>

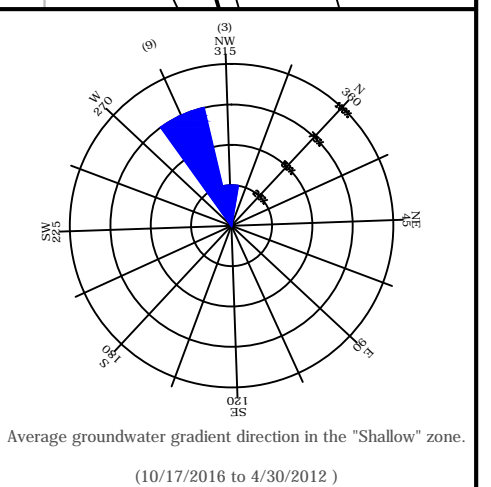
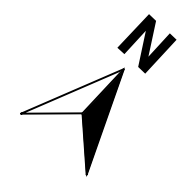
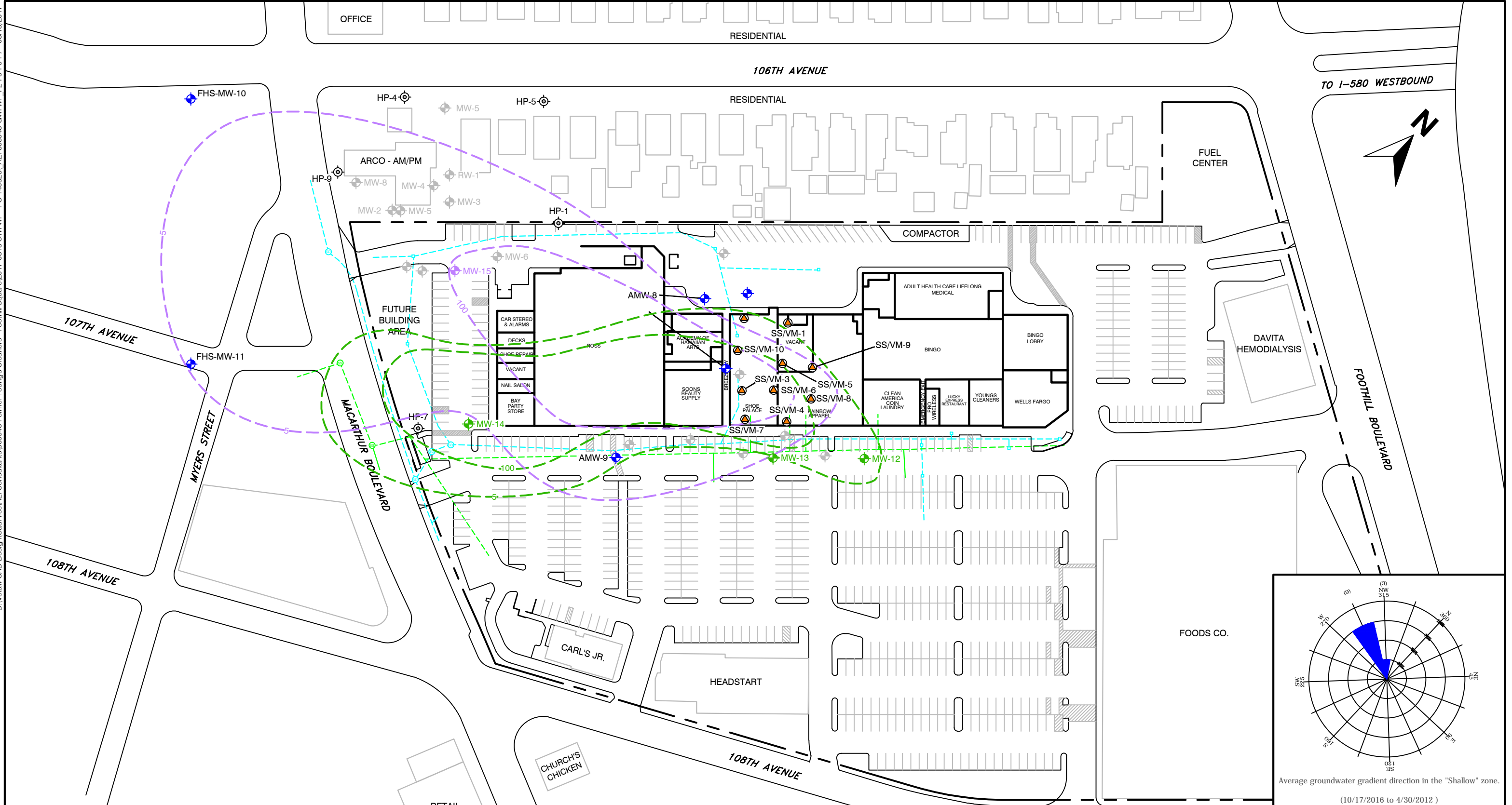
## AEI Consultants

2500 Camino Diablo, Walnut Creek, California

### PCE ISOCONCENTRATION DEEP ZONE

<p style="margin: 0;">Foothill Square 10700 MacArthur Boulevard Oakland, California</p>	<p style="margin: 0;"><b>FIGURE 6</b> Project No. 365948</p>
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**LEGEND**

AMW-1	Groundwater Monitoring Well	Former Dry Cleaner Location	Approximate Property Boundary	Storm Drain Line
MW-5	Abandoned Groundwater Monitoring Well	Proposed Shallow Monitoring Well Location	PCE Isoconcentration Contour Line for Shallow Zone ( $\mu\text{g/L}$ )	Sanitary Sewer Line
SS/VM-1	Twinned Permanent Soil Vapor/Sub-Slab Vapor Probe	Proposed Deep Monitoring Well Location	PCE Isoconcentration Contour Line for Deep Zone ( $\mu\text{g/L}$ )	
HP-1	CPT Boring/Hydropunch Sample (PES, 1997)			



**AEI Consultants**  
 2500 Camino Diablo, Walnut Creek, California

**PROPOSED MONITORING WELL LOCATIONS**

Foothill Square  
 10700 MacArthur Boulevard  
 Oakland, California

**FIGURE 7**  
 Project No. 365948