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By Alameda County Environmental Health 5:01 pm, Nov 15, 2017

November 6, 2017

Ms. Karel Detterman, PG  
Hazardous Materials Specialist  
Alameda County Environmental Health  
1131 Harbor Bay Parkway  
Alameda, California 94502

**Subject: Transmittal – Work Plan, Additional Investigation,**  
27501 Loyola Avenue, Hayward, California  
Site Cleanup Program Case No. RO0003150

Dear Ms. Detterman:

Please find enclosed the Work Plan, Additional Investigation for the property located at 27501 Loyola Avenue in Hayward, California (RO0003150). The activities presented in the report were performed to meet the requirements discussed during our October 13, 2017.

“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 SWRCB’s GeoTracker website.”

If you have any questions or need additional information, please do not hesitate to call me at (925) 918-0637, or Mr. Trent Weise with AEI Consultants at (408) 559-7600.

Sincerely,



Mr. Daniel Bo

November 6, 2017

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

*Submitted Via Electronic Upload to DEH FTP and GeoTracker (T1000003150)*

**Subject: Work Plan, Additional Investigation**  
27501 Loyola Avenue, Hayward, California  
Site Cleanup Program Case No. RO0003150  
AEI Project No. 335476

Dear Ms. Detterman:

On behalf of Harvest Investments, AEI Consultants (AEI) has prepared this work plan to meet the request from the Alameda County Department of Environmental Health (DEH) in hopes of being the final investigation necessary to allow development at 27501 Loyola Avenue, Hayward, California ("the Site"). Figure 1 presents the Site location and vicinity. The scope of work presented herein was discussed and requested by the DEH during the recent working meeting on October 13, 2017, and reiterated in the electronic mail message the same day. The DEH requested the following additional activities to close the perceived data gaps related to the release from the former service station at the Site and to complete the characterization of potential risks to the residential use of the Site, including:

- Resampling each of the recently installed soil gas probes (SG-1 through SG-4) to provide an additional temporal data point.
- Install and sample one additional soil gas probe, SG-5, in the vicinity of the former waste oil underground storage tank (UST).
- Advance two soil borings to collect soil and groundwater samples, one adjacent to SG-1 and one in the vicinity of the former waste oil UST, and SG-5.

The DEH also requested a table presenting the soil samples and results for shallow soil samples collected at the Site, summarized for depths between 0 to 5-feet below ground surface and 5 to 10-feet bgs. Table 1, enclosed, presents the requested summary of soil sample results. Sample locations are shown on Figure 2. The following observations can be made:

- A total of 25 soil samples have been collected between the depths of 0 and 5-feet, and 13 soil samples have been collected between the depths of 5 and 10-feet bgs.
- Soil samples have been collected and analyzed for petroleum hydrocarbons, volatile organic compounds (VOCs), metals (arsenic, cadmium, chromium, lead, nickel, and zinc), organochlorine pesticides, polychlorinated biphenyls (PCBs), polyaromatic hydrocarbons (PAHs), and semi-volatile organic compounds (SVOCs).
- With the exception of one soil sample that yielded lead at a concentration of 83 milligrams per kilogram (mg/kg) only slightly above the Environmental Screening Level (ESL) of 80

mg/kg, no other chemicals nor metals were detected at concentrations above their respective ESLs.

The proposed investigation activities are presented below.

## **SCOPE OF WORK**

To meet the request of the DEH, AEI proposes the following scope of work for this investigation as presented below.

### **Preliminary Field Activities**

The existing Site-specific health and safety plan will be updated as needed for this proposed scope of work, 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.

### **Soil and Groundwater Sampling**

AEI proposes to advance to soil borings at the Site to a total depth of up to 20-feet bgs to collect soil and groundwater samples at the locations shown on Figure 2. Each soil borings will be advanced by a State of California-licensed drilling company using a truck-mounted direct push drilling rig. Soil core will be collected continuously. The soil core will be described using the Unified Soil Classification System (USCS) and Munsell Soil Color Chart. The soil core will also be screened with a photo ionization detector (PID) for VOCs. Soil description, color, odor, PID measurements, and other notable features will be recorded on field boring logs.

Soil samples will be collected from each soil boring at depths of 2.5, and 7.5-feet bgs for chemical analysis. Soil samples will be collected in approximate six-inch sections of the acetate liner, capped with Teflon™ tape and plastic endcaps, labeled with a unique identifier, and placed in an ice-chilled cooler for transport under chain-of-custody protocol to the laboratory for analysis. The soil samples will be analyzed for total petroleum hydrocarbons as gasoline (TPHg) and VOCs using US EPA Testing Method 8260B, and total petroleum hydrocarbons as diesel (TPHd) and motor oil (TPHmo) using US EPA Testing Method 8015B, modified.

Upon reaching first encountered groundwater, anticipated between the depths of eight and 15-feet bgs, a temporary well will be constructed using by emplacing a new disposable well-screen within the open borehole. Groundwater will then be extracted using new tubing and a peristaltic pump. Collected groundwater will be decanted in the appropriately-preserved laboratory-supplied bottleware that will be sealed, labeled with a unique identifier, and placed in ice-chilled cooler for transport under chain-of-custody protocol to the laboratory for analysis. Collected groundwater samples will be analyzed for VOCs using US EPA Testing Method 8260B.

### **Soil Gas Sampling**

AEI will collect soil gas samples from the recently installed soil gas probes (SG-1 through SG-4) and install and sample one additional soil gas probe, at the location shown on Figure 2.

To construct the additional soil gas probe, a soil boring will be advanced to approximately 5.5-feet bgs and a temporary soil gas probe will be constructed in general accordance with the *Advisory – Active Soil Gas Investigations*, dated July 2015 and issued by the California Department



of Toxic Substances Control (DTSC) and Los Angeles and San Francisco Regional Water Quality Control Boards. Each soil vapor probe will be constructed with a vapor screen attached to ¼-inch diameter Teflon™ or equivalent tubing placed at approximately five feet bgs and covered with approximately one-foot of sand. The soil gas probe will then be sealed by backfilling the remaining section of borehole with bentonite to the surface. The soil gas probe will be protected within a well box.

After waiting the *Advisory*-recommended equilibration time of a minimum of two-hours the newly installed soil gas probe and existing, a shut-in test, a leak test, and purging of the sample tubing and screen will be conducted. Soil gas samples will then be collected from each of the newly constructed soil gas probes using laboratory-supplied, batch-certified clean, one-liter evacuated canisters and flow regulators set at approximately 150 milliliters per minute (mL/min). After approximately five minutes (depending on the down-hole vacuum), or -5 in Hg vacuum in the canister, each canister will be closed and removed from the sampling line and the final canister vacuum will be recorded. The canister sample will be sealed with a gas tight cap, appropriately labeled, and entered onto a chain-of-custody documentation for delivery to the laboratory. Each soil gas sample will be analyzed for VOCs using US EPA Test Method TO-15, and oxygen and the leak check compound helium using ASTM D1945.

### **Soil Boring Destruction**

Following sample collection, the soil borings will be destroyed as required by ACPWA.

### **Investigation Derived Waste**

Investigation derived waste will be stored on-site in sealed, labeled, department of transportation (DOT) approved 55-gallon drums. Disposal will depend upon the receipt of the analytical results.

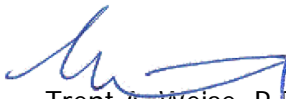
### **Reporting**

Upon the completion of the above-described field activities and receipt of the laboratory analytical data, AEI will prepare a report presenting the methods and results of the investigation. The report will summarize the investigation activities, tabular summaries of the data, and figures showing the sample locations. The soil, soil gas, and groundwater sample results will be compared to the California State Water Resources Control Board's *Low-Threat Underground Storage Tank Case Closure Policy* and/or the current Environmental Screening Levels (ESLs) provided by the California Regional Water Quality Control Board, San Francisco Bay Region as appropriate.

**CLOSING**

AEI appreciates working with the DEH to move this Site forward and allow for the safe development of the proposed residential structures. If there are any questions regarding our investigation, please do not hesitate to contact Mr. Trent Weise at (408) 559-7600.

Sincerely,  
**AEI Consultants**

  
Trent A. Weise, P.  
Vice President



Enclosures

# TABLES

**TABLE 1**  
**Summary of Shallow Soil Sample Results**  
**Former Shell Service Station**  
**27501 Loyola Avenue**  
**Hayward, California**

Sample ID	Date Sampled	Sample Depth (feet bgs)	TPH (mg/kg)	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)	BTEX (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Total Chromium (mg/kg)	Lead (mg/kg)	Nickel (mg/kg)	Zinc (mg/kg)	4,4'-DDD (mg/kg)	4,4'-DDE (mg/kg)	4,4'-DDT (mg/kg)	PCBs (mg/kg)	PAHs (mg/kg)	SVOCs (mg/kg)
ESL (Residential, Shallow)			--	740	230	11,000	--	0.023	970	5.1	560	0.067	39	--	80	820	23,000	2.7	1.9	1.9	0.25	--	--
<i>Soil Samples Collected Between 0 and 5-feet bgs.</i>																							
SB-1-0.5	07/18/17	0.5	--	0.111 J, J3	<44.8	319 <sup>a</sup>	--	0.000368 J	<0.00114	<0.00114	<0.00343	--	--	--	<b>83.0</b>	--	--	--	--	--	--	--	--
SB-1-2.5	07/18/17	2.5	--	0.0560 J	<4.78	2.11 <sup>a</sup> J	--	0.000358 J	<0.00120	<0.00120	<0.00259	--	--	--	6.80	--	--	--	--	--	--	--	--
SB-2-0.5	07/18/17	0.5	--	0.0827 J	<46.3	268 <sup>a</sup>	--	0.000545 J	<0.00116	0.000348 J	0.00135 J	--	--	--	26.5	--	--	--	--	--	--	--	--
SB-2-2.5	07/18/17	2.5	--	<0.109	<4.34	3.52 <sup>a</sup> J, J6	--	0.000298 J	<0.00109	<0.00109	<0.00326	--	--	--	10.5	--	--	--	--	--	--	--	--
SB-3-0.5	07/18/17	0.5	--	<0.117	<4.68	<9.36 <sup>a</sup>	--	0.000363 J	<0.00130	<0.00130	<0.00390	--	--	--	5.29	--	--	--	--	--	--	--	--
SB-3-2.5	07/18/17	2.5	--	<0.555	<4.44	<8.88 <sup>a</sup>	--	<0.00111	<0.00111	<0.00111	<0.00333	--	--	--	6.56	--	--	--	--	--	--	--	--
SB-4-0.5	07/18/17	0.5	--	0.0458 J	<4.62	<9.24 <sup>a</sup>	--	<0.00116	<0.00116	<0.00116	<0.00347	--	--	--	7.78	--	--	--	--	--	--	ND	--
SG-3-2.5	07/18/17	2.5	--	--	--	--	--	--	--	--	--	--	--	--	7.78	--	--	--	--	--	--	ND	--
SG-4-0.5	07/18/17	0.5	--	--	--	--	--	--	--	--	--	--	--	--	7.78	--	--	--	--	--	--	ND	--
E-3-4	7/24/1984	4-5.5	--	<1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
EX-1	12/15/93	5	<1	--	--	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	9.3	--	--	--	--	--	--	--	--
EX-2	12/15/93	5	<1	--	--	--	--	<0.005	<0.005	<0.005	<0.005	--	--	--	9.8	--	--	--	--	--	--	--	--
B-1-1	04/03/01	0.5-1.0	--	--	--	--	--	--	--	--	--	2.18	<0.943	36.6	15.5	48.3	77.8	ND	ND	ND	--	ND	--
B-2-1	04/03/01	0.5-1.0	--	--	--	--	--	--	--	--	--	<1.92	--	--	<7.21	--	--	--	--	--	--	--	--
B-3-1	04/03/01	0.5-1.0	--	--	--	--	--	--	--	--	--	5.10	<0.962	34.1	8.1	44.6	351	0.0300	0.260	0.175	--	ND	--
B-4-1	04/03/01	0.5-1.0	--	--	--	--	--	--	--	--	--	2.42	--	--	<7.21	--	--	--	--	--	--	--	--
B-5-1	04/03/01	0.5-1.0	--	--	--	--	--	--	--	--	--	3.72	--	--	<7.08	--	--	--	--	--	--	--	--
B-7-1	04/03/01	0.5-1.0	--	<1	<5	14.50	<0.005	--	--	--	--	2.59	--	--	<6.94	--	--	--	--	--	--	--	--
B-7-3	04/03/01	3.0-3.5	--	<1	<5	<10	<0.005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-8-1	04/03/01	0.5-1.0	--	<1	<5	17.2	<0.005	--	--	--	--	4.32	<0.962	28.5	7.11	38.6	53.6	0.0104	0.054	0.0612	--	ND	--
B-8-3	04/03/01	3.0-3.5	--	<1	<5	11.2	<0.005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-9-1	04/03/01	0.5-1.0	--	<1	--	--	<0.005	--	--	--	--	3.09	--	--	<6.36	--	--	--	--	--	--	--	--
B-9-3	04/03/01	3.0-3.5	--	<1	--	--	<0.005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-10-1	04/03/01	0.5-1.0	--	<1	<5	15.2	<0.005	--	--	--	--	4.81	<0.862	37.1	8.69	41.2	85.5	0.0229	0.327	0.019	ND	ND	ND
B-10-3	04/03/01	3.0-3.5	--	<1	<5	<10	<0.005	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	--	ND

**TABLE 1**  
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**27501 Loyola Avenue**  
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Sample ID	Date Sampled	Sample Depth (feet bgs)	TPH (mg/kg)	TPHg (mg/kg)	TPHd (mg/kg)	TPHmo (mg/kg)	BTEX (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl-benzene (mg/kg)	Xylenes (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Total Chromium (mg/kg)	Lead (mg/kg)	Nickel (mg/kg)	Zinc (mg/kg)	4,4'-DDD (mg/kg)	4,4'-DDE (mg/kg)	4,4'-DDT (mg/kg)	PCBs (mg/kg)	PAHs (mg/kg)	SVOCs (mg/kg)
ESL (Residential, Shallow)			--	740	230	11,000	--	0.023	970	5.1	560	0.067	39	--	80	820	23,000	2.7	1.9	1.9	0.25	--	--
<b>Soil Samples Collected Between 5 and 10-foot bgs.</b>																							
B-7-6	04/03/01	6.0-6.5	--	<1	<5	<10	<0.005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-8-6	04/03/01	6.0-6.5	--	<1	<5	<10	<0.005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-9-6	04/03/01	6.0-6.5	--	<1	--	--	<0.005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
B-10-6	04/03/01	6.0-6.5	--	<1	<5	12.8	<0.005	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	--	ND
E-3-9	7/24/1984	9-10.5	--	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S-30-11	06/25/89	9.5-11	--	<5	--	--	--	<0.05	<0.1	<0.1	<0.3	--	--	--	--	--	--	--	--	--	--	--	--
S-31-9	06/25/89	9-10.5	--	<5	--	--	--	<0.05	<0.1	<0.1	<0.3	--	--	--	--	--	--	--	--	--	--	--	--
S-32-9	06/25/89	9-10.5	--	<5	--	--	--	<0.05	<0.1	<0.1	<0.3	--	--	--	--	--	--	--	--	--	--	--	--
S-33-9	06/25/89	9-10.5	--	<5	--	--	--	<0.05	<0.1	<0.1	<0.3	--	--	--	--	--	--	--	--	--	--	--	--
S-34-9	06/25/89	9-10.5	--	<5	--	--	--	<0.05	<0.1	<0.1	<0.3	--	--	--	--	--	--	--	--	--	--	--	--
S-35-11	06/25/89	9.5-11	--	<5	--	--	--	<0.05	<0.1	<0.1	<0.3	--	--	--	--	--	--	--	--	--	--	--	--
S-36-10'	06/25/89	10	ND	--	--	--	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--
S-38-10'	07/12/89	10	ND	--	--	--	--	ND	ND	ND	ND	--	--	--	--	--	--	--	--	--	--	--	--

**Notes:**

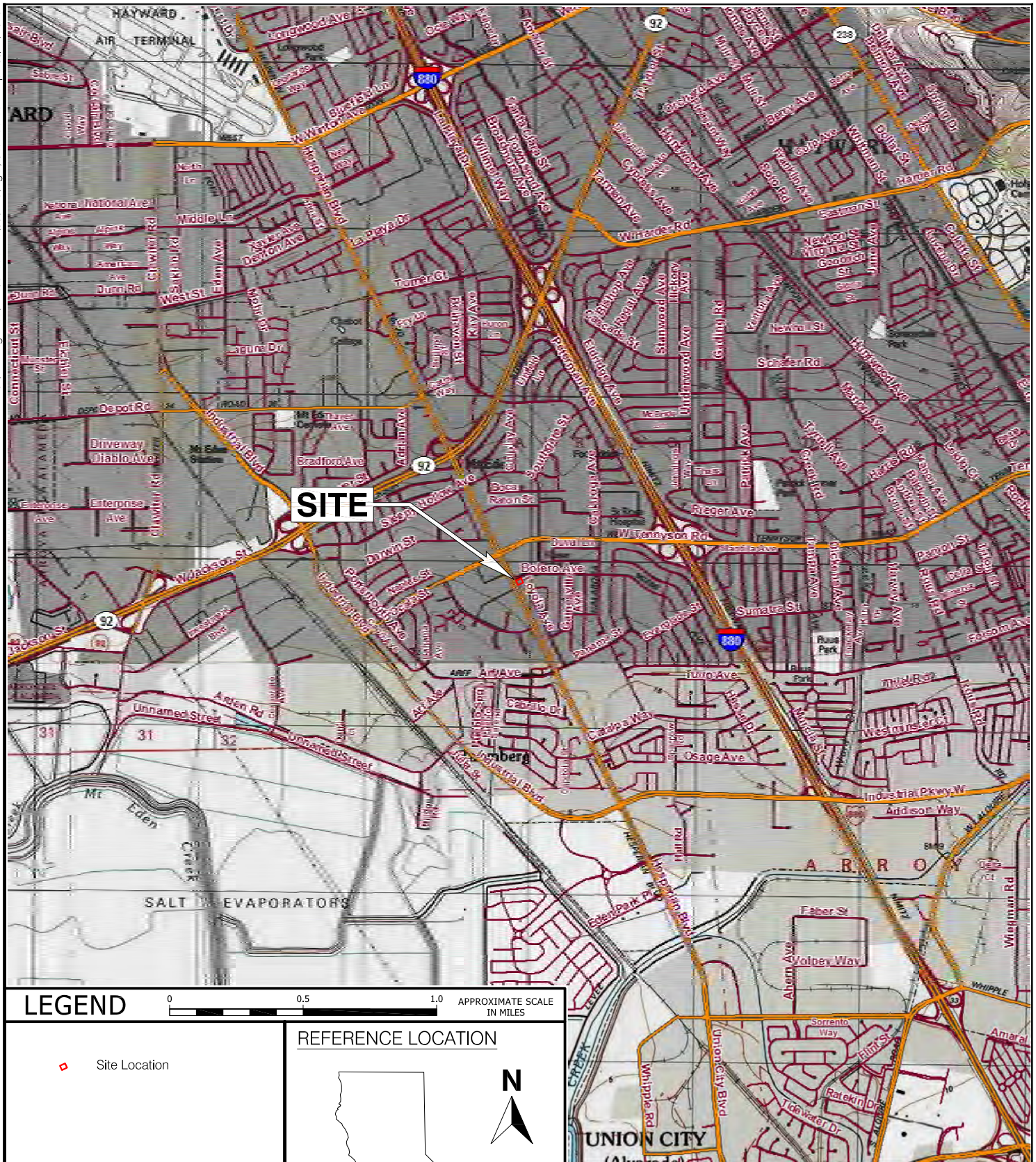
- 4,4'-DDD = 4,4'-dichlorodiphenyldichloroethane
- 4,4'-DDE = 4,4'-dichlorodiphenyldichloroethylene
- 4,4'-DDT = 4,4'-dichlorodiphenyltrichloroethane
- PCB = polychlorinated biphenyl
- PAH = polycyclic aromatic hydrocarbons
- SVOC = semi volatile organic compound
- bgs = below ground surface
- mg/kg = milligrams per kilogram
- ND = Not detected above laboratory reporting limits
- = Not analyzed
- ESL = Environmental Screening Level, Summary of Soil ESLs, Table S-1, Direct Exposure and Table S-2, Leaching to Groundwater Levels-Drinking Water (February 2016)
- TPH = total petroleum hydrocarbons
- TPHg = total petroleum hydrocarbons in the gasoline range
- TPHd = total petroleum hydrocarbons in the diesel range
- TPHmo = total petroleum hydrocarbons in the motor oil range
- BTEX = benzene, toluene, ethylbenzene, and xylenes
- VOC = volatile organic compound
- bgs = below ground surface
- J = The identification of the analyte is acceptable; the reported value is an estimate.
- J3 = The associated batch QC was outside the established quality control range for precision.
- J6 = The sample matrix interfered with the ability to make any accurate determination; spike value is low.
- a = TPH-mo result is C22-C32 and C32-C40 combined.

**Historical analytical information based on review of:**

- Letter by Gettler-Ryan Inc. dated November 19, 1987.
- Case Closure Summary by City of Hayward Fire Department, dated June 19, 1996.
- Human Health Risk Assessment by Cambria, dated May 10, 2001.

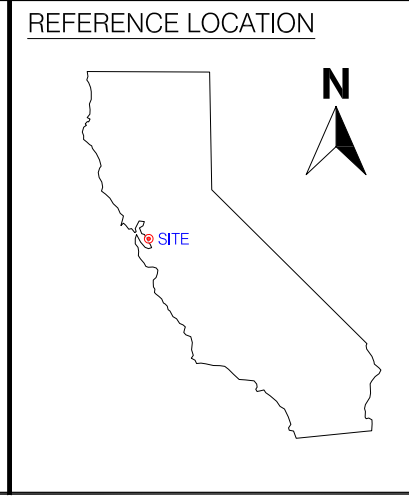


# FIGURES



**LEGEND** 0 0.5 1.0 APPROXIMATE SCALE IN MILES

◆ Site Location  
 Map Source:  
 USGS 7.5 Minute  
 Topographic Quadrangle Map,  
 Hayward, CA - 1993,  
 Photorevised 1996



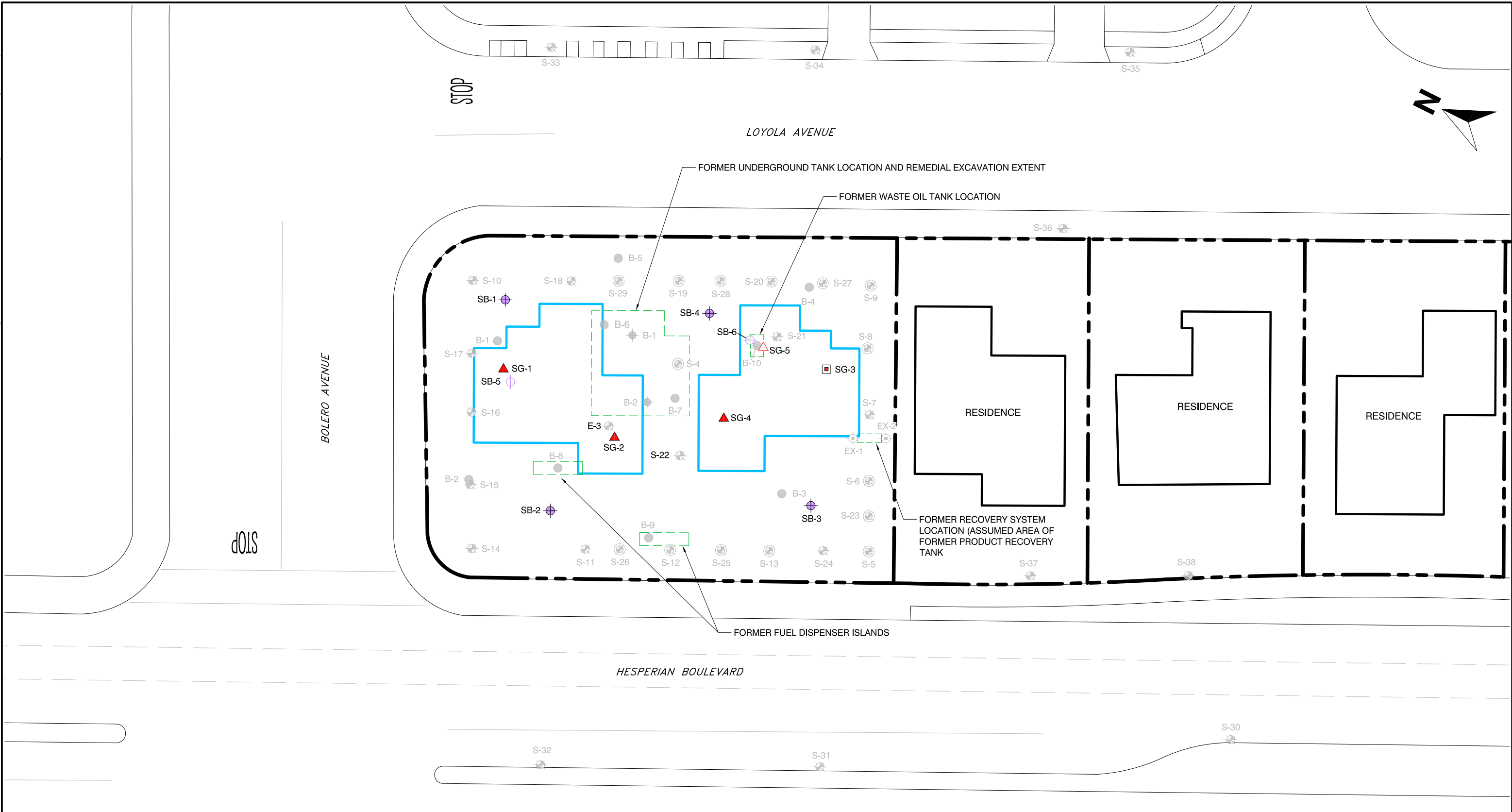
**AEI Consultants**  
 3880 South Bascom Avenue, San Jose, California

**SITE LOCATION MAP**

27501 Loyola Avenue  
 Hayward, California

**FIGURE 1**  
 Project No. 335476





**LEGEND**

- SB-5 Proposed Soil Boring Location
- SG-5 Proposed Soil Gas Probe
- SB-1 Soil Boring Location
- SG-1 Soil Gas Probe
- S-29 Destroyed Extraction Well
- S-35 Destroyed Groundwater Monitoring Well
- B-10 Former Soil Boring (Cambria 2001)
- B-1 Former Soil Boring (Soil Subsequently Excavated)
- EX-2 Confirmation Soil Sample (Locations Estimated; locations described as on ends of product recovery UST excavation)
- Footprint of Proposed Development
- Approximate Property Boundary



**NOTE:**  
 Base Map Sources:  
 Google Earth, Image Date 10/30/2015  
 Shell Plot Plan, 12/1979  
 Woodward-Clyde Consultants Map, 04/1989  
 EMCON Associates Report, 10/20/1984

<b>AEI Consultants</b> 2500 Camino Diablo, Walnut Creek, California	
<b>SITE PLAN</b>	
27501 Loyola Avenue Hayward, California	FIGURE 2 Project No. 335476